



United Nations
Climate Change Secretariat

Nations Unies
Secrétariat sur les changements climatiques

Intended Nationally Determined Contributions (INDCs)

Note: This document compiles all INDCs communicated by 4th April 2016. In preparing the synthesis report on the aggregate effect of INDCs, the secretariat worked strictly on the basis of information communicated by this date. Adjustments made by Parties to their INDCs after this date were not considered in the report.

Parties

Albania
Algeria
Andorra
Angola
Antigua and Barbuda
Argentina
Armenia
Australia
Azerbaijan
Bahamas
Bahrain
Bangladesh
Barbados
Belarus
Belize
Benin
Bhutan
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Brunei Darussalam
Burkina Faso
Burundi
Cabo Verde
Cambodia
Cameroon
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Central African Republic
Chad
Chile
China
Colombia
Comoros
Congo
Cook Islands
Costa Rica
Cote d'Ivoire
Cuba
Democratic Republic of Congo
Djibouti
Dominica
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Ecuatorial Guinea
Egypt Arab
El Salvador
Eritrea State of
Ethiopia Federal
European Union
Fiji
Gabon
Gambia
Georgia
Ghana



Intended Nationally Determined Contribution (INDC) of the Republic of Albania following decision 1/CP.19 and decision 1/CP.20

This document presents Albania's Intended Nationally Determined Contribution following decision 1/CP.19 and decision 1/CP.20 of the United Nations Framework Convention on Climate Change (UNFCCC), which invited Parties to communicate the UNFCCC Secretariat their INDCs, with the aim to achieve the ultimate objective of the UNFCCC as set out in Article 2 of the Convention.

Albania is a developing country with a per capita GDP of 10 thousand USD. It's total greenhouse emissions are relatively low (8,4 M tons in 2009, of which roughly 60% is of the CO₂ emissions) it is aiming to take its fair share from the efforts to avoid dangerous climate change. The country has unique emission profile as its electricity generation is based on renewable source generation at currently, with hydro power providing dominant part of it. Unfortunately, this hydro power capacity is vulnerable to climate change impacts. The unique electricity mix of Albania is positive in the sense that electricity system is on a level of decarbonisation what other countries aim for only on the long term, but it also means that there is limited opportunity for further policies and measures in this sector to reduce emissions. Maintaining the low greenhouse gas emission content of the electricity generation and decoupling growth from increase of greenhouse gas emissions in other sectors are the primary drivers of the country regarding mitigation contribution as its INDC. Having high uncertainty of data regarding non CO₂ greenhouse gases results that Albania is to provide its INDC regarding CO₂. If data quality of non-CO₂ greenhouse gases improves, Albania intends to expand its INDC to other greenhouse gases as well.

The INDC of Albania is a baseline scenario target: it commits to reduce CO₂ emissions compared to the baseline scenario in the period of 2016 and 2030 by 11.5 %. This reduction means 708 kT carbon-dioxide emission reduction in 2030.

The emission trajectory of Albania allows to have a smooth trend of achieving 2 tons of greenhouse gas emissions per capita by 2050, which can be taken as a target for global contraction and convergence of greenhouse gas emissions. In the following additional information is provided regarding the INDC in order to facilitate clarity, transparency and understanding.

Mitigation contribution of GHG emissions	
Type	Baseline scenario target: a reduction in GHG emissions relative projected future emissions
Gases covered	Carbon Dioxide (CO ₂)
Target year	2030
Baseline	Business As Usual scenario of emissions projections based on economic growth in the absence of climate change policies, starting from 2016
Sectors covered	The INDC covers the following sectors of the greenhouse gas inventory: <ul style="list-style-type: none"> • Energy • Industrial processes
Planning process	<p>Planning process of the INDC included the review of available data and modelling work applicable to greenhouse gas reduction pathway as well as consultations with government stakeholders as well as with the public.</p> <p>The scenarios for the INDC were developed taking into consideration draft of the 3rd National Communication of Albania and all available scenario development work related to greenhouse gas emissions.</p> <p>Within the preparation process of the INDC it became clear that significant data uncertainty exist regarding the emissions of greenhouse gases other than CO₂ and in sectors outside of sectors covered by the INDC. Improvements were made on existing modelling work and the scenarios presented are result of this work.</p>
Participation in international market mechanism	Albania intends to sell carbon credits during the period until 2030 to contribute to cost-effective implementation of the low emission development pathway and its sustainable development. Albania foresees that for the utilization of international market mechanism is conditional on having effective accounting rules developed under the UNFCCC to ensure the environmental integrity of the mechanisms.
Fairness, equity, ambition and Means of Implementation	
Fairness, equity and ambition	<p>Albania is a developing country, highly vulnerable to the effects of the climate change. National emissions of the greenhouse gases represent only 0,017 % of global emissions and the net per capita GHG emissions Albania was 2.76 tCO₂e which is less the a quarter of emissions of high-income countries. .</p> <p>Albania will take into account the ultimate objective of the UNFCCC in its future development and committed to decouple greenhouse gas emissions from its economic growth and embarks on a low emission development pathway.</p>

	The INDC submitted by Albania is fair and ambitious because it aims to secure limited increase of its greenhouse gas emissions while it the country pursues a strong economic development pathway. Moreover, the pathway allows on long term for the convergence of Albania's per capita emissions to the 2 ton/capita level.
Means of implementation	<p>The results of the preparation of the INDC will be reflected in the Third National Communication of Albania and also will form the basis of the Environmental and Climate Change strategy which is in preparation. Development of the strategic directions for energy and transport sectors will take into consideration the INDC.</p> <p>Coordination of activities in relation to the strategy is foreseen to be coordinated by the Ministry of Environment which is the chair of the inter-ministerial body on Climate Change.</p> <p>Albania also transposes and implements parts of the EU legislation, including legislation on climate change and builds capacity for its implementation which supports its ability to reduce greenhouse gas emissions.</p> <p>Albania is a contracting party of the Energy Community Treaty which aims to extend the EU internal energy market to South East Europe and beyond on the basis of a legally binding framework. The overall objective of the Energy Community Treaty is to create a stable regulatory and market framework which also includes legislation aiming to reduce greenhouse gas emissions.</p>
Key Assumptions	
Metric Applied	The metric used for the GHG emissions is the Global Warming Potential on a 100 year timescale in accordance with the IPCC's 2nd Assessment Report
Inventory methodology	IPCC 2006 Guidelines
Approach to accounting for agriculture, forestry and other land uses	Greenhouse gas emissions and removals from agriculture, forestry and other land uses are currently not included in the accounting. Emissions and removals from these sectors can be included in the INDC at a later stage when technical conditions allow for that.

Having relatively high uncertainty regarding emission data in the LULUCF sector and non-CO2 greenhouses gas emissions and removals Albania reserves its right to review its INDC until 2020 upon the availability of more accurate data and improved technical conditions regarding land use, land use change and forestry as well as non-CO₂ greenhouse gases and include it in its nationally determined contribution.

If the agreement or related COP decisions are amended before their entry into force in such a way that they include rules or provisions that in effect alters the assumptions under which this INDC has been developed, Albania reserves the right to revisit the INDC.

Albania requests the UNFCCC Secretariat that this submission is published on the UNFCCC webpage and that our INDC is included in the synthesis report to be prepared by the Secretariat.

The People's Democratic Republic of Algeria

**Intended Nationally Determined Contribution
INDC-Algeria-**

September 3rd, 2015

The People's Democratic Republic of Algeria
Intended Nationally Determined Contribution

INDC-ALGERIA

September 3rd, 2015

1. Preamble

Algeria, a country severely affected by desertification is- like other countries in Africa and in the south of the Mediterranean- particularly vulnerable to the multiform effects of climate change that threaten to undermine its economic and social development.

Respecting its contractual engagements, Algeria renews its commitments to work together with the Contracting Parties to achieve the objectives of the United Nations Framework Convention on Climate Change (UNFCCC). To this end, it reaffirms, at the highest level, its willingness to spare no effort for the success of the twenty-first session of the Conference of the Parties, to be held in Paris on December 2015.

Given the climate emergency, Algeria reiterates the need for the adoption in Paris of an ambitious and durable agreement on climate change, inspired by the latest scientific findings, and centered around the principle of common but differentiated responsibility, while taking due consideration of the specific circumstances and respective capabilities of the Contracting Parties. It is in this spirit that the present provisional contribution, nationally determined, was prepared and submitted by Algeria, in accordance with the relevant provisions of decisions 1/CP 19 and 1/CP 20 of the Conference of the Parties to the UNFCCC.

This provisional contribution concerns the two equally important pillars of the UNFCCC; namely, the mitigation of greenhouse gas emissions (GHG) and adaptation to climate change impacts.

As a developing country, Algeria has no historical responsibility in terms of accumulation of greenhouse gases. Being a low GHG-emitting country, its current responsibility is very limited. In addition, country's socio-economic and development needs are continuously increasing in order to meet the legitimate expectations of its people, especially its youth.

The provisional contribution of Algeria is submitted under the condition of access to new external financial resources from its bilateral and multilateral partners, as well as clean technology transfer on concessional and preferential terms and strengthening its technical capabilities.

This provisional contribution is designed taking into account the particularly difficult financial and economic present conditions of Algeria, due to the significant drop in oil prices.

Its final contribution at the time of entry into force of the Paris Agreement on Climate Change will be adjusted accordingly.

Algeria's INDC covers the 2021-2030 period. It involves mainly the sectors of energy, industry, transport, agriculture and forestry, construction and the environment. Algeria will submit its final contribution at the time of ratification of the Paris agreement, before its intended entry into force in 2020.

2. The INDC preparation framework

Following the adoption of decision 1/ CP20 on December 2014 that defined the framework of the Intended Nationally Determined Contribution, Algeria launched a review of its institutional and regulatory framework in the matter of energy efficiency and the promotion of new and renewable energy adopted in 2011.

On February 2015, this review has been finalized and submitted for adoption by the Council of Ministers that endorsed it at its meeting on May 24th, 2015. A working group on the INDC was established, with the participation of representatives from 14 ministries and the National Economic and Social Council, and placed under the authority of the Minister in charge of environment. The preliminary outcomes of the work of that group have been submitted for the consideration and decision of the Interministerial Council meeting devoted to the climate issue, held on July 7th, 2015, under the chairmanship of the Prime Minister. A National Climate Committee (NCC), placed under the authority of the Minister in charge of environment, was established. It is composed of representatives of relevant governmental departments and the National Economic and Social Council.

The NCC strengthens the institutional framework to ensure coordination, monitoring and assessment of national policies and programs on climate change and proposes measures to guarantee the implementation of Algeria's commitments in relation to the UNFCCC, international institutions and /or decisions on climate change issues.

At its meeting on July 26th, 2015, chaired by the Minister in charge of environment, the NCC finalized the provisional contribution of Algeria.

The INDC of Algeria was developed in an inter-sectorial framework and has greatly benefited from the consultation process with stakeholders held at the national level. In addition, the National Dialogue Conference on Climate, organized on July 28th, 2015 was a platform for dialogue and exchanges on Algeria's climate ambitions, with the participation of institutional and socio-economic actors, local authorities and business organizations, socio-professional associations, environmental protection associations, as well as experts, scholars, and representatives of the civil society. Six ministers, four of which were represented at the NCC, as well as the President of the National Economic and Social Council, have participated in this Conference.

Within the framework of public awareness chapter, media representatives took also part in this meeting, the first of its kind to be held in Algeria, and with more than 500 participants. Based on this wide consultation, a reviewed version of the Algeria's INDC was submitted for adoption to the Interministerial Council, chaired by the Prime Minister, at its meeting on September 3rd, 2015.

3. National circumstances

Algeria is an African and a Mediterranean country covering 2 381 741 km². Like many of the countries in its region, Algeria is affected by desertification and land degradation. Most of the country is arid or semi- arid. The areas receiving more than 400 mm of rain per year are located in a narrow strip along the coast, not-exceeding 150 km large. Moreover, due to climate changes, yearly average rainfall declined by more than 30% over the past decades.

Parallel to the coastline, mountains act as a barrier and accentuate the climate drought towards the south of the country. Anthropic effects aggravate those caused by geographic characteristics. Indeed, 85 % of the Algerian population lives in the northern part of the country. Moreover, land characteristics reduce the possibilities of carbon capture in Algeria, when compared to countries with a large vegetal coverage.

Algeria is facing extreme climate events recrudescence, which accentuates its vulnerability. In addition, the recurrence of drought cycles, with longer durations, accelerates desertification.

In fact, more than 50 million of hectares face highly deteriorated conditions. Rural population -composed mainly of farmers and breeders- is forced into exodus to large cities, for survival. This situation is the direct result of land impoverishment and the decline in water resources.

Important programs were launched by public authorities since the seventies. This includes the realization of a “great green dam”, a forest cover of 1200 km long and 20 km large, on average. This achievement constitutes today one of the great prides of our country and represents a significant carbon sink. Other big projects were also initiated, such the program of pastoral plantation covering thousands of hectares.

With regard to floodings, the country is always facing this phenomenon. Several regions witnessed tragic events resulting in heavy losses human lives and considerable material damages. For example, the 2001 catastrophic floods in Algiers resulted in the death of 715 persons and thousands of disaster victims. The recurrent floods continue to adversely impact public financial resources.

Therefore, Algeria is entitled to benefit from the climate international solidarity arising from the future Paris agreement. It is particularly vulnerable to greenhouse gases accumulation effects, for which it is not in any way responsible, neither in the past, nor today or in the future. Natural gas, a cleaner energy than coal, dominates Algeria's energy mix since decades. In this respect, its proven and possible natural gas resources shall be able to assist its partners to promote the use of this clean source of energy.

Algeria also faces the challenges related to food security, to its ecosystems and agriculture resilience, to major risks and to natural resources scarcity. In addition, it shall satisfy the expanding needs of its growing population, in terms of employment, education, health and housing, while the economic and financial environment is aggravated by the significant drop in oil prices.

It should be noted as well that Algeria is already contributing for several decades in the mitigation efforts through its energy mix, based essentially on natural gas. The development of its electricity generation capacity is largely based on combined-cycle power plants. A hybrid power plant, combining solar energy and natural gas, is already operational. Besides, Algeria's efforts to reduce gas flaring emissions are to be pursued and sustained.

4. Mitigation Measures

Algeria's mitigation strategy covers mainly energy, forests, housing, transport, industry and waste sectors. It is based in particular on the national programs for renewable energy and energy efficiency. This reflects its willingness to pursue its efforts in combating the adverse impacts of climate change. Such programs shall be pursued and sustained so long as Algeria benefits from international support in terms of new and external financial resources, and technology transfer, and capacity building.

Algeria's contribution in mitigation is based on the three most important greenhouse gases: carbon dioxide gas (CO₂), methane (CH₄) and nitrous oxide (N₂O).

At the meeting held on May 24th, 2015, under the chairmanship of His Excellency President of the Republic Mr. Abdelaziz BOUTEFLIKA, the Council of Ministers adopted the new national programs for renewable energy and energy efficiency.

These ambitious programs aim at reducing by 9% the global consumption of energy by 2030. It aims to engage thermal insulation of an important housing program, as well as to convert to LPG a million of light-duty vehicles and more than 20.000 buses.

By 2030, it aspires to the deployment, on a large scale, of photovoltaic and wind power as well as thermal solar energy, and the integration of cogeneration, biomass and geothermal energy. This program ultimately aims to reach the target that 27% of the electricity produced nationally is derived from renewable sources of energy.

In fact, Algeria, being the largest country in Africa, in the Mediterranean and in the Arab world, has one of the highest solar deposits in the world, estimated to exceed five billion GWh/yr. The annual sunshine duration is estimated to be around 2 500 hours on average, and could exceed 3 600 hours in some parts of the country.

In addition to its 200 thermal cities, Algeria, the tenth largest country in the world, has a geothermal reservoir composed of Albian groundwater, which extends over 700 000 km².

The action plan of the government aspires also to reduce gas flaring to less than 1%, by 2030.

Regarding methane emissions reduction, Algeria intends to give priority to the management of household solid waste, with the objective to achieve, by 2030, a full coverage of wastes dumps in its territory.

Regarding carbon capture, the country aims to accelerate and intensify its National Reforestation Plan with a global objective of reforestation of 1 245 000 ha.

The mitigation actions to be implemented by Algeria, planned for the 2021-2030 period, will lead to the following contribution:

Reduction of greenhouse gases emissions by 7% to 22%, by 2030, compared to a business as usual -BAU- scenario, conditional on external support in terms of finance, technology development and transfer, and capacity building. The 7% GHG reduction will be achieved with national means.

The Algerian contribution regarding mitigation is defined as follows:

Type of INDC: Relative reduction compared to Business as usual (BAU) scenario.
Implementation period: 2021-2030
Methodological approach: combined approach: Bottom-Up concerning sectors and Top-Down concerning national objectives.
Sectors covered: Energy (Generation, Transport, Building and Industry); Industrial processes; Agriculture, Forests, Land use and Waste.

Estimating GHG emissions: Directives of IPCC -2006- and Global Warming Potential, as agreed in the IPCC 4th Assessment Report on Climate change.

Coverage of Greenhouse Gases: Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O).

Global Warming Potential (GWP): the used GWP are those of the IPCC 4th Assessment Report: GWP (CO₂) = 1, GWP (CH₄)= 25, GWP (N₂O)= 298.

Implementation, monitoring and readjustment instruments:

- National Climate Committee;
- National Climate Change Agency;
- National Climate Plan;
- National Actions Plan for Environment and Sustainable Development ;
- Legal framework;
- National system of Measurement, Reporting and Verification -MRV- (2016-2020).

Main planned actions: conditional on support in terms of external finance, technology development and transfer and capacity building.

Operate an energy transition and an economic diversification to achieve Algeria's sustainable development goals.

Main Actions in Energy Sector:

- Reach 27% of electricity generated from renewable sources of energy by 2030;
- Generalize high-performance lighting;
- Thermal insulation of buildings between 2021 and 2030;
- Increase the share of liquefied petroleum and natural gas in the consumption of fuels between 2021 and 2030;
- Reduce the volume of gas flaring to less than 1 % by 2030.

Main Actions in Waste Sector:

- Waste valorization ;
- Composting organic waste and green waste;
- Energy recovery and recycling of methane from landfill sites and waste water treatment plants.

Main Actions in forestry Sector: afforestation, reforestation and prevention of forest fires as well as improving means to fight them.

Awareness, Information and Education Actions: Information, awareness and communication on issues and climate change challenges and implementation of an education, training and research climate change national program.

Considerations of fairness and ambition of the INDC based on national circumstances

- Algeria, as a low GHG emitting country, has already invested heavily in adaptation to climate change impacts as well as in mitigation and intends to pursue its efforts in this regard;
- Algeria has been participating since a long period of time in the greenhouse gas mitigation, by virtue of its high share of natural gas in its energy mix;
- The Algerian economy is highly dependent on petroleum export revenues. This situation makes Algeria vulnerable to climate change adverse effects, as well as to the negative impacts of response measures;
- Algeria faces significant and growing development and adaptation needs given its high population growth, increasing demand for energy, goods and services.

How INDC will contribute to the accomplishment of article 2 of the Convention on Climate Change

Through its mitigation actions for by 2030, considering its socio-economic development objectives, and taking into account its national circumstances, Algeria will contribute, on an equitable basis, to the achievement of the objective of article 2 of the Convention.

5. Adaptation Measures

Algeria aims to develop a national plan of adaptation to the impacts of climate change in the context of the finalization of its contribution, and in order to promote a more climate change resilient economy. Priority will be given to the protection of the population and the preservation of natural resources and key infrastructure against the risks of extreme events.

The objective of this national plan is:

- To reinforce the ecosystems resilience (flooding and drought) in order to curtail the risks of natural disasters related to climate change;
- To fight against erosion and rehabilitate its degraded lands as part of the efforts to combat desertification ;
- To integrate the impacts of climate change into sectorial strategies, in particular for agriculture, water management, public health and transport;
- To integrate the impacts of climate change on political stability and national security.

The main adaptation measures to be adopted require diversified international support, including financing, capacity-building and technology transfer. These adaptation measures mentioned in the National Climate Plan are as follows:

- Adapting the institutional and regulatory framework to climate change;
- Reinforcing institutional and human capacities in combating climate change;
- Establishing a monitoring and early warning system and capacity building with regard to extreme climate events management;
- Elaborating regional and local plans for adaptation to climate change.

6. Planning and Institutional Framework for Implementation

The provisional intended and nationally determined contribution will be finalized between 2016 and 2020 under the authority of the National Climate Committee. It will be updated according to the outcomes of the Paris Climate Conference and will take into account the financial situation of Algeria at the moment of its finalization.

It will address quantified greenhouse gas mitigation objectives for the period 2020-2030, using the methodology developed by the Intergovernmental Panel on Climate Change. The contribution will be finalized and implemented with the active participation of all the actors in the society and, in particular, representatives of the civil society, economic actors, representatives of the local authorities and the scientific community.

It will be accompanied by a comprehensive public awareness-raising campaign through the media, schools, companies, local collectivities and mosques. In this regard, forums on cities and climate change will be set up.

Algeria's ambition regarding mitigation and adaptation will be achieved within North-South and South-South cooperation, with its bilateral and multilateral- traditional and new- partners. A group of "Friends of Algeria's Ambition for Adaptation and Mitigation" (G5A), will be established and convene its first meeting on the sidelines of the Paris Conference.

Finally, Algeria aims to establish and host a World Forum on Renewable Energy that will provide the appropriate platform for dialogue and consultation between policy-makers, industry and civil society. The first session of the Forum will be held in 2016. Its outcomes will be presented at the 22nd Conference of the Parties.

Conclusion

The ambition of GHG mitigation- shown by Algeria in its provisional INDC- is based on four pillars: an institutional tool represented by the National Climate Change Agency, a mechanism of coordination and monitoring represented by the National Climate Committee, the climate roadmap of Algeria through the National Climate

Plan, and the national MRV system (Measurement, Reporting and Verification) that will be established.

The climate strategy of Algeria is defined in the National Climate Plan. It aims, notably, at reinforcing water resources mobilization, controlling flood, protecting the coastline, combating drought and desertification and increasing the ecosystems and agriculture resilience and facing climate change.

For that purpose, Algeria is committed to finalize and adopt its National Climate Plan before the 21st Conference of the Parties.



Govern d'Andorra

Contributions prévues déterminées au niveau national (CPDN) de l'Andorre, concernant la décision 1/CP.19 et la décision 1/CP.20

Préambule

Lors de la dix-neuvième session de la Conférence des Parties tenue à Varsovie, la décision 1/CP.19, moyens de poursuivre la mise en œuvre de la plate-forme de Durban, a été adoptée, prévoyant dans son paragraphe 2, point b, que compte tenu de sa détermination à adopter, à sa vingt et unième session (décembre 2015), un protocole, un autre instrument juridique ou un texte convenu d'un commun accord ayant valeur juridique, élaboré au titre de la Convention et applicable à toutes les Parties, et afin que cet instrument entre en vigueur et soit appliqué à compter de 2020, d'inviter toutes les Parties à engager ou amplifier les préparatifs internes de leurs contributions prévues déterminées au niveau national (CPDN)⁶, sans préjudice de la nature juridique des dites contributions, dans la perspective de l'adoption d'un protocole, d'un autre instrument juridique ou d'un texte convenu d'un commun accord ayant valeur juridique, élaboré au titre de la Convention et applicable à toutes les Parties, en vue d'atteindre l'objectif de la Convention tel qu'énoncé en son article 2, et d'en faire part bien avant la vingt et unième session de la Conférence des Parties (d'ici au premier trimestre 2015 pour les Parties qui sont prêtes à le faire) d'une manière propre à améliorer la clarté, la transparence et la compréhension des contributions prévues, sans préjudice de la nature juridique des dites contributions.

Cette invitation à toutes les Parties, de communiquer leurs contributions déterminées au niveau national à l'avance de la vingt et unième session de la Conférence des Parties (pour le premier trimestre de 2015 par les Parties prêtes à le faire) d'une façon qui facilite la clarté, la transparence et la compréhension des CPDN, a été réitérée lors de la Conférence des Parties tenue à Lima, à travers le paragraphe 13 de la décision 1/CP.20.

Suite à la Conférence des Parties de la Convention cadre des Nations unies sur les changements climatiques (CCNUCC) tenue à Copenhague en Décembre 2009 (COP15), la Principauté d'Andorre a montré sa volonté d'adhérer à la Convention. Le 2 mars 2011, le pays a adhéré à la Convention, en tant que Partie non visée par l'annexe I (non-Annexe I)⁷.

Dans ce sens, l'Andorre a le plaisir de communiquer les contributions prévues, déterminées au niveau national, en accord avec les décisions 1/CP.19 et 1/CP.20.

Description de l'engagement

Les engagements en termes de réduction des émissions non-absorbées découlent du premier rapport bisannuel de l'Andorre à la Convention cadre des Nations unies sur les changements climatiques (Décembre 2014). Pour 2030, les contributions prévues déterminées au niveau national (CPDN) de l'Andorre sont en phase avec l'évolution de la voie représentative des concentrations RCP2.6, compatible avec le maintien de l'augmentation de la température mondiale en dessous des 2°C au cours du XXI^{ème} siècle, par rapport aux valeurs de 1850 à 1900, et en cohérence avec un scénario avec mesures d'atténuation strictes, et le maintien des concentrations mondiales de CO₂ éq. dans la fourchette 430-480 ppm. Ces engagements se concrètent par une réduction des émissions équivalentes non absorbées de 37% (193,73 Gg CO₂ éq.) par rapport aux émissions non absorbées du scénario Business as usual, définies sur la base du Premier rapport bisannuel de l'Andorre à la Convention cadre de Nations unies sur les changements climatiques (Décembre 2014), d'ici 2030.

⁶ En anglais, *Intended Nationally Determined Contributions (INDC)*

⁷ La CCNUCC est entrée en vigueur le 31 mai 2011.

Type d'engagement

Réduction absolue par rapport aux émissions non absorbées du scénario *Business as usual*, définies sur la base du *Premier rapport bisannuel de l'Andorre à la Convention cadre de Nations unies sur les changements climatiques* (2014).

Référence

Émissions non absorbées du scénario *Business as usual* (530,55 Gg CO₂ eq., pour 2030), définies sur la base du *Premier rapport bisannuel de l'Andorre à la Convention cadre de Nations unies sur les changements climatiques* (2014)⁸.

Couverture

Secteurs de l'énergie et des déchets, selon les catégories d'inventaire du GIEC 2006.

Champ d'application

Les gaz suivants, non réglementés par le protocole de Montréal : dioxyde de carbone (CO₂), méthane (CH₄), oxyde nitreux (N₂O) et hexafluorure de soufre (SF₆).

Période d'implantation

Du 1^{er} janvier 2016 au 31 décembre 2030.

Niveau de réduction

Réduction de 37% (193,73 Gg CO₂ eq.) des émissions annuelles non absorbées par rapport au scénario *Business as usual*, d'ici 2030. Ce pourcentage de réduction devrait être revu dans les cas où une modification importante sur la méthodologie d'inventaire soit introduite, par rapport à celle considérée par l'inventaire des gaz à effet de serre (GES) présenté dans le *Premier rapport bisannuel de l'Andorre à la Convention cadre de Nations unies sur les changements climatiques* (2014).

Émissions couvertes

Secteurs de l'énergie et des déchets : 98,8% des émissions totales en 1990, 98,5% en 2011.

Contribution nette des mécanismes internationaux fondés sur le marché

Aucune contribution des crédits internationaux.

Processus de planification

Adhésion à la convention cadre des Nations unies sur les changements climatiques, en tant que Partie non visée par l'annexe I (non-Annexe I), le 2 mars 2011.

Approbation par le Gouvernement d'Andorre de la révision du plan national des déchets (2012-2016), le 20 décembre 2011.

Présentation par le Gouvernement d'Andorre du Livre blanc de l'énergie, le 19 juillet 2012.

⁸ (Miquel C., Armengol J.-L., Dobarro J., Rovira N., 2014) Premier rapport bisannuel de l'Andorre à la Convention cadre de Nations unies sur les changements climatiques. Govern d'Andorra, Departament de Medi Ambient. Andorra la Vella, Principat d'Andorra, 134 pp.

Création de la structure et des groupes de travail pour répondre aux obligations découlant de la CCNUCC, sous la coordination du Ministère de l'Environnement, le 2 octobre 2013.

Approbation par le Gouvernement d'Andorre du *Premier rapport bisannuel de l'Andorre à la Convention cadre des Nations unies sur les changements climatiques (2014)*, le 17 décembre 2014.

Approbation par le Gouvernement d'Andorre des contributions prévues déterminées au niveau national (CPDN) de l'Andorre, conformément aux décisions 1/CP.19 et 1/CP.20 de la Conférence des Parties de la convention cadre des Nations unies sur les changements climatiques, le 22 avril 2015.

Hypothèses clés

Valeurs considérées des pouvoirs de réchauffement

Dans le but de rendre compréhensible et comparable l'engagement de l'Andorre, les valeurs ont été rapportées à des valeurs d'équivalent de dioxyde de carbone moyennant leur Pouvoir de Réchauffement Global (PRG). Les valeurs PRG de référence considérées sont celles du deuxième rapport d'évaluation du GIEC (*SAR, GWPs, 100 year time horizon*)⁹.

Bien que non applicables aux Parties non visées par l'annexe I de la Convention, les valeurs proposées par la décision 24/CP.19 (révision des directives FCCC pour la notification des inventaires annuels des Parties visées à l'annexe I de la Convention) seront adoptées dans la mesure du possible.

Méthode d'estimation des émissions et des absorptions

- a) Lignes directrices du GIEC 2006.
- b) Hypothèse adoptées dans l'inventaire présenté dans le *premier rapport bisannuel de l'Andorre à la Convention cadre des Nations unies sur les changements climatiques (2014)*.

Approche de comptabilisation pour l'agriculture, la foresterie et les autres utilisations des terres

Les perturbations naturelles ou les événements extraordinaires concernant les puits de carbone ne seront pas considérés pour évaluer l'atteinte des engagements (contributions prévues déterminées au niveau national, CPDN).

Équitable et ambitieux

L'engagement des Parties doit être conforme à leur responsabilité, à leurs capacités ainsi qu'au soutien reçu de la communauté internationale. Dans ce sens,

- L'Andorre est Partie prenante de la Convention cadre des Nations unies sur les changements climatiques en tant que Partie non visée par l'annexe I (non-annexe I). **Au niveau international, l'Andorre est responsable en 2010 d'approximativement 0,00112% (547,43 Gg CO₂ eq.) des émissions mondiales¹⁰, responsabilité qui tend à diminuer**, avec une réduction entre 2000 et 2010 de 21%.
- **Le pays a connu un essor substantiel depuis 1990**, avec une croissance démographique de +56% (entre 1990 et 2010) et une croissance économique de +50% en termes de PIB réel pour la même période (+73% si l'on se réfère à 1990-2005). Cette augmentation a eu des conséquences directes sur la consommation d'énergies, notamment dans les domaines du chauffage de bâtiments *-pour rappel, la température*

⁹ IPCC SAR WG1 (1996), Houghton, J.T.; Meira Filho, L.G.; Callander, B.A.; Harris, N.; Kattenberg, A., and Maskell, K., ed., Climate Change 1995: The Science of Climate Change, Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, ISBN 0-521-56433-6

¹⁰ Émissions (hors absorptions) de l'Andorre: *Premier rapport bisannuel de l'Andorre à la Convention cadre des Nations unies sur les changements climatiques (2014)*. Émissions mondiales: 5^{ème} rapport d'évaluation du GIEC, groupe de travail III (2014)

moyenne de l'Andorre est de 4,9°C (1950-2010)¹¹, avec une altitude moyenne de 2.044 mètres sur le niveau de la mer- et du transport routier -la totalité des déplacements internes se réalisent moyennant le réseau routier national¹²-. Par rapport aux émissions de 1990, l'Andorre a accru ses émissions de +28% (2011), valeur comparable à l'augmentation des émissions mondiales +29% (2010).

- Malgré ces évolutions, les émissions de l'Andorre présentent une **claire tendance à la diminution depuis 2005 (-9,6% entre 2005 et 2010)**, au contraire de ce qui est observé au niveau mondial avec une augmentation supérieure à 4,3% pour la même période (Cf. figure 1). Les émissions relatives annuelles se situent également au-dessous de la moyenne mondiale avec, pour 2010, 4,85¹³ tonnes de CO₂ éq. par habitant, et 211,11 tonnes de CO₂ éq. par M€ (PIB réel)¹⁴.

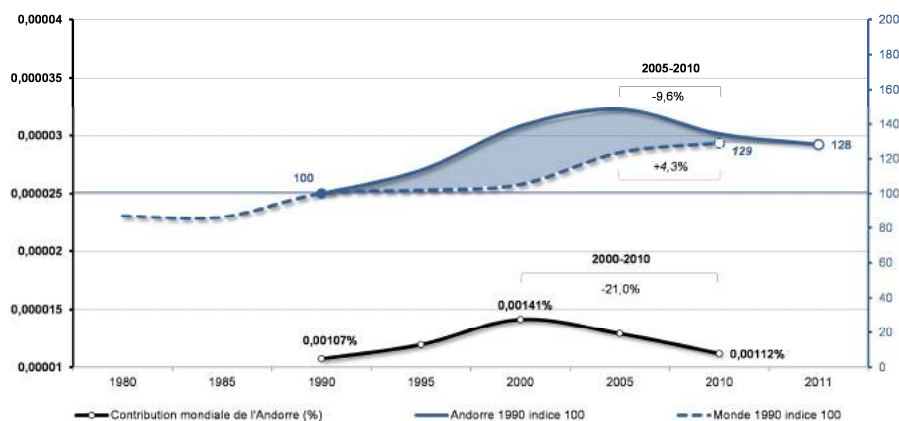


Figure 1. Contribution de l'Andorre (noir) et évolution de l'indice des émissions mondiales et du pays (bleu).

- Bien que la responsabilité de l'Andorre concernant les émissions au niveau mondial soit **extrêmement limitée**, les effets du changement climatique se font déjà percevoir. Le climat a déjà évolué avec une tendance des températures à la hausse d'environ +0,20°C/décennie pour les valeurs moyennes et des précipitations annuelles qui expérimentent une baisse d'au moins 45 mm/décennie (1950-2012). **Ces variations vont sans doute se traduire par des impacts sur la ressource hydrique et sur l'enneigement, base fondamentale d'un des piliers de l'économie andorrane : le tourisme lié aux sports d'hiver.** Les changements climatiques auront sans doute des impacts bien au-delà de ces domaines. La santé, les risques naturels, la production hydroélectrique, l'agriculture, la biodiversité, en sont des clairs exemples de par leur vulnérabilité face au phénomène.
- Selon le *Premier rapport bisannuel de l'Andorre à la Convention cadre de Nations unies sur les changements climatiques* (2014), le secteur du transport routier est celui qui représente la contribution la plus importante dans l'inventaire des gaz à effet de serre de l'Andorre avec, pour l'ensemble des années d'inventaire, 49,4% des émissions et des absorptions de GES (en valeurs absolues). Les secteurs « autres secteurs, fuels liquides » (chauffage des secteurs commercial/institutionnel et résidentiel) et « terres forestières qui continuent comme terres forestières », avec respectivement 21,6 et 19,2% suivent de loin le secteur du transport. Ces trois catégories expliquent à elles seules 90,3% de l'ensemble des inventaires des années 1990, 1995, 2000, 2005, 2010 et 2011.
- Les politiques de mitigation associées aux secteurs évoqués relèvent d'**actions à long terme**, avec des rentabilités et des résultats à court terme limités.
- Pour 2030, **les contributions prévues déterminées au niveau national (CPDN) de l'Andorre sont en phase avec l'évolution de la voie représentative des**

¹¹ Le mois de janvier est le mois le plus froid de l'année, avec une température moyenne négative de -2,1°C. À l'autre extrême, la température moyenne du mois de juillet, mois le plus chaud, atteint les 13,8°C.

¹² À l'exception des transports d'hélicoptères, utilisés surtout pour des transports sanitaires et des travaux en montagne.

¹³ La valeur deviendrait 5,86 tonnes de CO₂ éq./an/habitant après la révision et la purge des statistiques de recensement démographique.

¹⁴ PIB réel, base 1.521,42 M€ pour l'an 2000.

concentrations RCP2.6 du scénario avec mesures d'atténuation strictes, et le maintien des concentrations mondiales de CO₂ éq. dans la fourchette 430-480 ppm (Cf. tableau 1 et figure 2), condition nécessaire pour le maintien d'une température inférieure à 2°C au XXI^{ème} siècle (par rapport à la période 1850-1900), avec un degré de certitude probable (*likely*, 66%-100%).

- Au niveau mondial, les conditions nécessaires pour assurer une augmentation des températures au-dessous de la barre des 2°C au XXI^{ème} siècle (par rapport à la période 1850-1900), seront maintenues pour 2050 si les émissions rapportées à 2010 sont réduites d'entre 41 et 72%, et de 78 à 118% en 2100¹⁵.

Concentrations de CO ₂ éq. en 2100 (ppm)	Sous-catégories	Position relative des RCPs	Changement des émissions de CO ₂ éq. par rapport à 2010 (en %)			Probabilité de maintenir une température en-dessous des 2°C au XXI ^{ème} siècle (par rapport à 1850-1900)
			2030	2050	2100	
450 (430-480)	Fourchette totale	RCP2.6	-18 * (+4 à -43) *	-53 * (-41 à -72)	-104 * (-78 à -118)	66-100% (<i>likely</i>)

Tableau 1. Scénario objectif pour maintenir une température en-dessous des 2°C.
(* , estimé sur la base des valeurs de la médiane et des percentiles 10 et 90 du nuage des 450 ppm CO₂ éq. de la figure SPM.11 de l'IPCC AR5, synthesis report, SPM⁸)

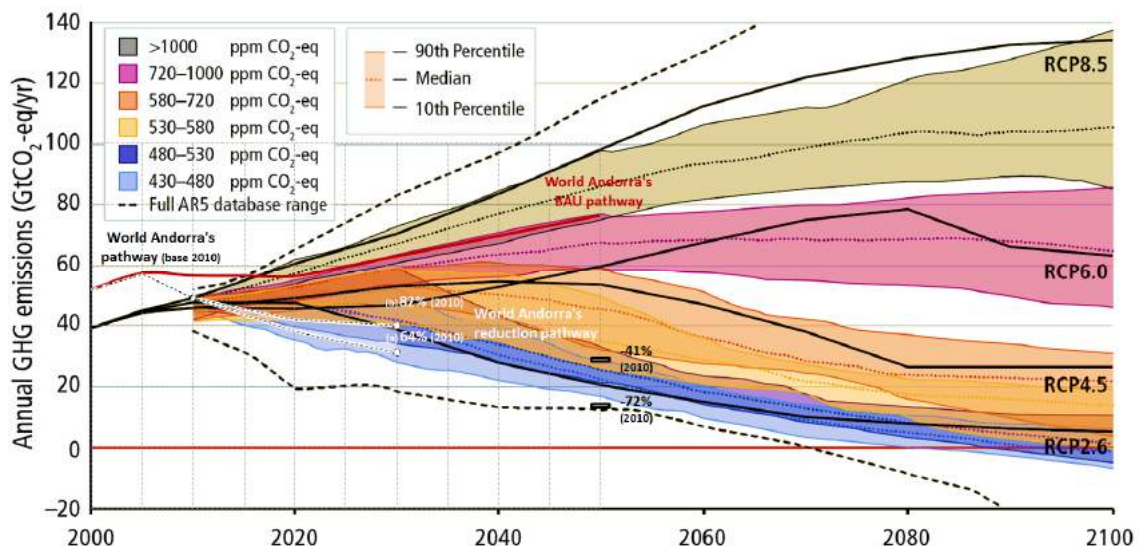


Figure 2. Ensemble des scénarios d'émissions de GES 2000-2100.

En blanc et pointillés, estimation du scénario mondial, en transposant au niveau international l'historique et les objectifs des CPDN de l'Andorre (année de base, 2010)
(modifié de l'IPCC AR5, synthesis report, SPM⁸)

Soutien reçu de la communauté internationale

Aucun soutien international reçu à ce jour pour la mise en place d'actions d'atténuation ou d'adaptation.

L'Andorre a demandé, et a reçu en avril 2013, l'appui d'un consultant externe nommé par le Programme des Nations Unies pour l'Environnement (*UNEP*) pour identifier les circonstances propres au pays, les étapes à suivre (documentation, échéances, etc.) et les possibles voies de financement. En cohérence avec cette assistance technique, début 2014, le pays a soumis un projet de financement au Global Environment Facility pour la préparation du premier rapport bisannuel (BUR1) et de la première communication nationale (NC1), qui n'a pas reçu de réponse à ce jour (mars 2015). Il faut rappeler que le paragraphe 44 de la décision 2/CP.17 prie instamment

¹⁵ IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

le Fonds pour l'environnement mondial (GEF) de mettre à disposition des fonds pour soutenir les Parties non-Annexe I à la préparation de leurs premiers rapports bisannuels de mise à jour le plus tôt possible en 2012 et sur la base du financement intégral des coûts convenus.



DRAFT

**Intended Nationally Determined Contribution
(INDC) of the
Republic of Angola**

November 2015

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EXECUTIVE SUMMARY

The contributions of Angola to this INDC are in the framework of the National Strategy for the Implementation of UNFCCC and the Kyoto Protocol, the Strategy to Fight Poverty (SFP), the National Adaptation Programme of Action (NAPA) and Long Term Strategy for Development of Angola (2025).

Angola is committed to take part in the aspiration set at International level to fight against the phenomenon of climate change, thus contributing to global efforts to reduce greenhouse gas (GHG) emissions. For this, Angola's Intended Nationally Determined Contribution (INDC) encompasses for Mitigation purposes both unconditional and conditional measures for the reduction of GHG. The country is committed to stabilize its emissions, and contribute to climate change mitigation by 2030, targeting the following sectors:

- Power generation from renewable sources; and
- Reforestation.

Angola plans to **reduce GHG emissions up to 35% unconditionally by 2030** as compared to the Business As Usual (BAU) scenario (base year 2005). In addition, it is expected that through a conditional mitigation scenario the country could **reduce an additional 15% below BAU emission levels by 2030**. In achieving its unconditional and conditional targets Angola expects to reduce its emissions trajectory by nearly 50% below the BAU scenario **by 2030 at overall cost of over 14.7 billion USD**.

Given to its extreme vulnerability to Climate Change impacts in some key economic sectors, Angola's INDC also includes priority Adaptation actions that will enable the strengthening of the resilience of the country towards the attainment of the Long Term Strategy for Development of Angola (2025).

Sectoral Intervention for Adaptation

The Angolan economy has been hit hard by the impact of climate change expressed as prolonged drought, damaging flash floods, forest fires, reduced crop production, reduced water resources, impacted fishing resources, etc. Many of the economy sectors of Angola have been impacted by climate variability in the last thirty years. However, there are economy sectors which are extremely vulnerable to impacts resulting from the extreme events and which will pose not only serious livelihood and direct health risks but can also affect the economic potential and national food security. Therefore within the context of this INDC, Angola prioritises the implementation of Adaptation measures in the following main sectors:

- Agriculture
- Coastal Zone
- Land-Use, Forests, Ecosystems and Biodiversity
- Water resources
- Health

Angola acknowledges that climate change adaptation requires unconditional as well as conditional actions in order to reduce the vulnerability of communities against the expected Climate Change impacts. The overall cost of implementing both the unconditional and conditional actions amounts **to around 1 billion USD across sectors up to 2030**.

Given the time constraint, this report on the INDC could not be exhaustive, and it is of a dynamic nature and thus will be refined in the light of new data and information.

1. NATIONAL CONTEXT

The Republic of Angola with a size of 1.25m sq km (481,354 sq miles) is located in SW Africa and extremely vulnerable to climate change impacts such as drought and floods particularly in the southern regions. Projections of mean annual rainfall averaged over the country from different models indicate a wide range of changes in precipitation for Angola. Furthermore, IPCC scenarios (SRES A1B scenario as shown in the IPCC 4th Assessment Report) have projected an increase of mean annual temperature in the region by 1.2 to 3.2°C by the 2060s, and 1.7 to 5.1°C by the 2090s. Climate models predict that over the next 50 to 100 years, Angola will experience increased temperatures, more extreme weather events, an expansion of arid and semi-arid regions, seasonal shifts in rainfall, localized floods, increased wildfires, sea level rise, increased rainfall in the northern parts of the country, changes in river flows and changes in sea and lake temperatures. According to the Angolan NAPA (2011), the major expected climate change threats and impacts are: floods, soil erosion, drought episodes, rise in sea-level. The main sectors identified as affected by climate change are: agriculture and food security; forest and biodiversity; fisheries; water resources; human health; infrastructures; coastal zones; energy.

In response to decisions adopted at the 19th and 20th sessions of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC), as a demonstration of its commitment to take part in the aspiration set at International level to fight against the phenomenon of climate change, thus contributing to global efforts to reduce greenhouse gas (GHG) emissions, Angola has embarked on the process of preparation of its intended determined contributions through a participatory approach. This document therefore presents Angola's Intended Nationally Determined Contribution (INDC) which encompasses for Mitigation purposes both unconditional and conditional measures for the reduction of GHG. Given to its extreme vulnerability to Climate Change impacts in some key economic sectors, Angola's INDC also includes priority Adaptation actions that will enable the strengthening of the resilience of the country towards the attainment of the Long Term Strategy for Development of Angola (2025).

2. ANGOLA'S MITIGATION CONTRIBUTION

Objectives and expected trajectories for 2030

Greenhouse gases covered

The contribution of Angola is based on the estimation of carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) for all economic sectors. F-gases emissions are not counted as they were considered negligible across the country.

Sectoral and geographical coverage

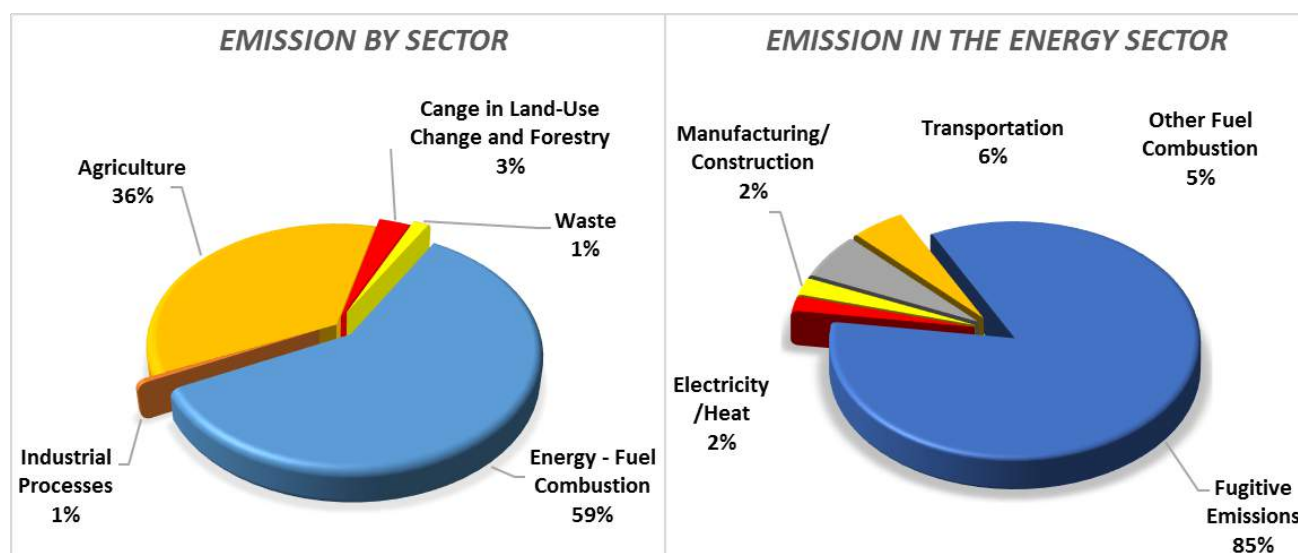
Based on the last GHG inventory, the selected sectors are defined according to the revised IPCC Guidelines 1996 and cover the entire territory.

Base year period and baseline data

The year 2005 is used as the reference year. Data are extracted from the latest national inventory of greenhouse gases and from the database of ENERDATA¹. The Global Warming Potential (GWP) values used are those determined by the IPCC for the preparation of national emissions inventories according Decision 4/CMP.7 of the UNFCCC by which from 2013 GWP of CH₄ is 25 and not 21, and PWG of N₂O is 298 and not 310.

¹ENERDATA, 2015

For the year 2005, GHG emissions amounted to 66.8 million tons of CO₂e, of which over 95% stemmed from the fossil fuel consumption. The baseline structure (2005) of GHG emission of Angola by sector shown below indicates the dominance of Energy fuel combustion sector followed by the Agriculture and Change in Land-Use Change and Forestry sectors. In addition, the contribution of the fugitive emissions in the energy sector is clearly evident.



Baseline structure (2005) of GHG emission of Angola by sector and emissions in the energy sector

Reference scenario without mitigation policies

The baseline scenario was developed with the GACMO model (*Greenhouse gas Abatement Cost Model*²) based on linear sectoral projections. It is based on the 2005 inventory of GHG emissions. This inventory was produced according to the revised guidelines of the Intergovernmental Panel on Climate Change (IPCC) and published in the Initial National Communication. The sectoral linear projection estimates the level of GHG emissions without mitigation measures to triple by 2030 from the level of emissions in 2005. More than 90% of these emissions would come from the Energy sector making this the privileged area for the development of mitigation options for Angola.

Contribution level

Therefore, the country is committed to stabilize its emissions by reducing GHG emissions up to 50% below BAU emission levels by 2030 through unconditional and conditional actions targeting the following sectors:

- Power generation from renewable sources; and
- Reforestation.

Unconditional Reduction

The level of reduction planned unconditionally is expected to be up to 35% by 2030 as compared to the Business As Usual (BAU) scenario, taking 2005 as the reference year.

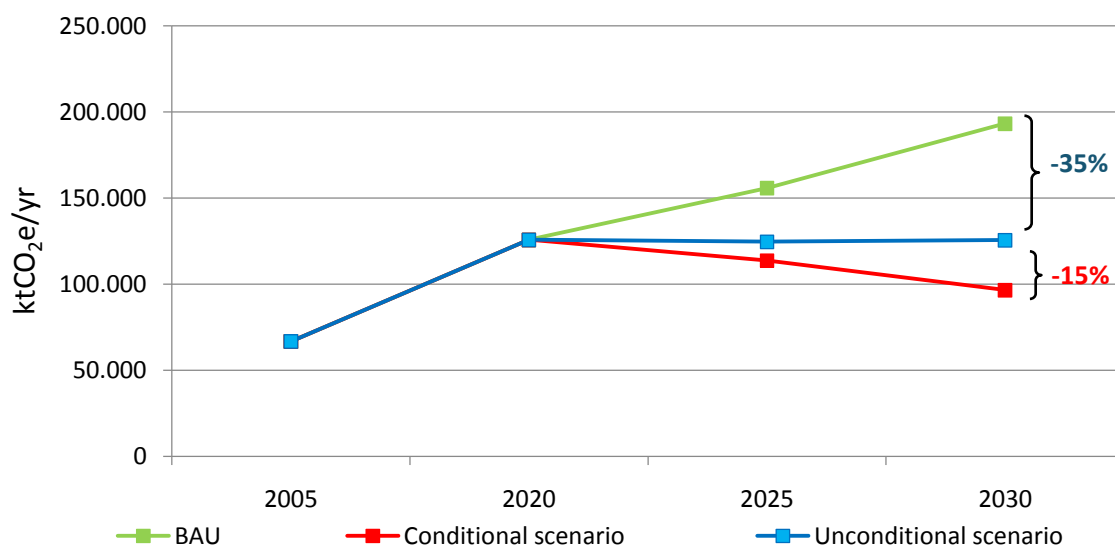
Conditional Reduction

In a conditional mitigation scenario Angola plans to reduce further its emissions. Therefore, the mitigation options identified in this scenario are expected to reduce an additional 15% below BAU emission levels by 2030. In total, in achieving its unconditional and conditional targets Angola

²JoergenFenhann, UNEP DTU Partnership, e-mail jqfe@dtu.dk

expects to reduce its emissions trajectory by nearly 50% below the BAU scenario across sectors by 2030.

Projection of GHG emissions in 2030



Baseline scenario and projections of Unconditional and Conditional mitigation scenarios for Angola

	2005	2020	2025	2030
Emissions – BAU scenario (ktCO ₂ e)		125 778	155 819	193 250
Emissions - Unconditional scenario (ktCO ₂ e)	66812	125 778	124 656 (-20%*)	125 612 (-35%*)
Emissions - Conditional scenario (ktCO ₂ e)		125 778	113748 (-27%*)	96625 (-50%*)

*From the baseline scenario.

Strategy and planning processes

For metrics and methodologies Global Warming Potential on a 100 year timescale is used in accordance with the IPCC's 4th Assessment Report. The contribution is to be developed into an **emissions budget for the period 2021 to 2030**.

National strategy and unconditional mitigation options

Unconditional Measures are the ongoing projects which funding has been fully identified and the Government of Angola is expected to implement during this INDC timeframe to accomplish a GHG reduction of at least 35% by 2030 as compared to the Business As Usual (BAU) scenario. The table below indicates sector strategies to achieve the mitigation goals in 2030.

Sectors	Description
Promotion of renewable energy	<p>Even though Angola is an oil-producing country, the potential for renewable energy is significant. With the growing energy demand in Angola, this type of project is seen as priority in the Angolan energy sector strategy. Being an environmentally friendly technology, the renewable-energy projects contribute to sustainable development of the country and will serve as an example for the expansion of this technology locally and nationally. In addition, the production of renewable energy and the dispatching of the entire production to the Angolan electrical system will not only reduce emissions of greenhouse gases (GHGs) but also will mitigate local pollution caused by atmospheric emissions from burning fossil fuel. On the economical perspective, the projects will lead to a reduction on demand from fossil fuels, which are a very expensive item within the national economy. Below are identified some examples of renewable energy projects that are being developed and/or implemented in Angola:</p> <ol style="list-style-type: none"> <li> <p><u>1. Repowering of Cambambe Central I Hydroelectric Power Plant:</u> The Cambambe project activity is located on the Municipality of Cambambe, 180 km east of Luanda, the National Capital. The Municipality of Cambambe is located on the south of the Kwanza Province, which is delimited by the Kwanza River. The proposed project comprises an expansion of the installed capacity to the existing Cambambe Hydroelectric Power Plant, from 180 MW to the current 260 MW. The project activity reduces emissions of greenhouse gases (GHGs) by preventing the operation of power plants that use fossil fuels as an energy source. In the absence of project activity, fossil fuels could be burned in power plants that are connected to the grid. An ex ante estimative of emission reductions achieved by the project is of 1,529,311 tCO₂e per year.</p> <li> <p><u>2. Cambambe Hydroelectric Second Power Plant:</u> The Cambambe project activity is located on the Municipality of Cambambe, 180 km east of Luanda, the National Capital. The proposed project comprises a capacity addition to the existing Cambambe Hydroelectric Power Plant with installation of additional 700 MW of the actual generation capacity. The project activity reduces emissions of greenhouse gases (GHGs) by preventing the operation of power plants that use fossil fuels as an energy source. In the absence of project activity, fossil fuels burned in power plants that are connected to the grid. An ex ante estimative of annual emission reductions is 3,282,000tCO₂e per year.</p> <li> <p><u>3. Tombwa Wind Farm</u> The Tombwa project activity is located on the Municipality of Tombwa, Namibe Province, 1,234 km east of Luanda, the National Capital. The project activity consists of a wind energy conversion into electrical energy, providing an alternative source of renewable energy. The energy generated will be a result of a total installed capacity of 100 MW and will produce power through 50 wind turbines, with a rated individual potency of 2MW. The wind farm has a main objective of generate electricity to the interconnected national system. This energy will reduce the amount of energy produced by the power plants that runs using fossil fuel, inserting</p>

Sectors	Description
	renewable energy into the system. Thus, helping to reduce emissions of greenhouse gases and encourage the use of alternative energy technologies. Although the ex-ante estimative of emission reductions are low(157,258 tCO₂e per year),the implementation of the project will mean an important contribution to achieve the government efforts to diversify the energy matrix, with the input of another source of clean energy with low environmental impact.
Stabilization of emissions in the agriculture production	Angola's climate diversity allows for the cultivation of a great variety of crops. The national agricultural potential of Angola is high enough that the country has the ability to be self-sufficient. Nevertheless, the sector is characterized mostly by small farmers working under subsistence farming methods. The surface area used for agriculture amounts to about 26% of the territory. GHG emissions in agriculture stem from animal production and wild fires. The objective is to stabilize GHG emissions from these sources. Besides, the country is willing to develop the production of ethanol as an alternative to fossil fuels.
Industrial processes	Angola's annual growth in manufacturing rose from 6.5% in 2012 to 8% in 2013 and was driven particularly by wood, cement, and electric materials production. In 2005 GHG emissions of the industry sector were related to activities such as these: breweries, cement, clinker, pastry, crackers and cookies, margarine, beef, animal feed, glass, freezer assembly, etc. The GHG emissions from Industrial processes are estimated to be very low (less than one million tons of CO ₂ e).
Land Use, Land Use Change and Forestry ³	As regards the resource base, natural forest is the most significant biomass resource in the country, comprising an estimated 59 million hectares according to the latest data with current deforestation rates estimated at 0.2% per year. About 53 million hectares of land are considered to be forests – however of those only 2% are actually made up of dense, humid, high productivity forests, that are very rich in biodiversity, 47.1% comprises of a mosaic of forest and savannah, 45.4% is woodland (miombo) and the remaining percentage is occupied by steppe, mangrove and wetlands. Wood logging is essential to the local population, both economically and socially. The potential for wood cutting each year is estimated at 333,000 m ³ and the current rate of cutting is estimated to be 85,000 m ³ per year. The calculation of CO ₂ emissions and removals from land use changes and forestry is primarily based on the following main activities: <ul style="list-style-type: none"> - Forestry conversion; - Use of biomass; - Phase-out of harvested land. The sector is thought to have captured close to 3 million tons of CO ₂ e in 2005, and the country is committed to increase carbon sequestration from the forestry sector to 5 million tons of CO₂e per year by 2030 .

Presentation of conditional mitigation options

Key available projects that are expected to maximize the amount of avoided emissions, while concurrently minimizing the level of required upfront investment have been selected as potential mitigation options to be developed conditionally. These mitigation options identified in this scenario are expected to reduce an additional 15% below BAU emission levels by 2030. By undertaking

³Personal Communication. Forest Development Institute of Angola (IDF).

Tômbwa, Namibe province	100	Wind power	130
CaculoCabaça Hydropower Project	2,172	Large scale hydropower	2,472
Zenza (1+2)	450 + 120	Large scale hydropower	649
Tumulo do Cacador	450	Large scale hydropower	512
Luime	330	Large scale hydropower	376
Luquixe 2	2	Small scale hydropower	9
Carianga	381	Large scale hydropower	433.6
Bembeze	260	Large scale hydropower	295.9
Salamba	47.9	Large scale hydropower	54.5
Quissonde	120	Large scale hydropower	136.6
Quissuca	121	Large scale hydropower	137.7
Cuteca	203	Large scale hydropower	231.0
Cafula	403	Large scale hydropower	458.7
Dala	360	Large scale hydropower	409.7
Utiundumbo	169	Large scale hydropower	192.3
Capunda	283	Large scale hydropower	322.1
Balalunga	217	Large scale hydropower	247.0
Calindo	58	Large scale hydropower	66.0
Cuvera	62	Large scale hydropower	70.6
Cacombo	29	Large scale hydropower	33.0
Capitongo	41	Large scale hydropower	46,7
Mucundi	73.5	Large scale hydropower	83.7
Calengue	190	Large scale hydropower	216.2
Pampos de Sonhe	37	Wind power	48.1
Quitobia	103	Wind power	133.9
Samba caju	84	Wind power	109.2
Uige	20	Wind power	26
Maquela do Zombo	10	Wind power	13
Capande	23	Wind power	29.9
Hoque	23	Wind power	29.9
Dunga	103	Wind power	133.9
Mombollo	41	Wind power	53.3
Tundavala	23	Wind power	29.9
Quimone	103	Wind power	133.9
Huila	11	Wind power	14.3
Chipindo	6	Solar power plant	9
Lubango	28	Solar power plant	42
Kuito	5	Solar power plant	7.5
CH Gove	5	Solar power plant	7.5
Caála	5	Solar power plant	7.5
WakuKungo II	76	Solar power plant	114
Balém do Dango	20	Solar power plant	30
WakuKungo I	5	Solar power plant	7.5
Lubango II	23	Solar power plant	34.5
Capanda	225	Solar power plant	337,5
CT Luena	4	Solar power plant	6
Lucapa	5	Solar power plant	7.5
CT Dundo	7	Solar power plant	10.5
CH Chicapa	4	Solar power plant	6
CT Ondjiva	2	Solar power plant	3
Camenongue	2	Solar power plant	3
CTG Fútila	14	Solar power plant	21
Leua	2	Solar power plant	3
Luanda	100	Biomass-MSW	533.65
Benguela/lobito/catumbela	20	Biomass-MSW	110.89

Altocatumbela	150	Biomass- wasteforest	371.15
Chinguar	60	Biomass- wasteforest	166.33
Cuima	60	Biomass- wasteforest	166.3
Biocom	40	Biomass – sugar cane	115.74
Lucapa	30	Biomass- wasteforest	95.45
Luena	30	Biomass- wasteforest	95.76
Luachimo	30	Biomass- wasteforest	95.67
Dala	30	Biomass- wasteforest	95.74
Chicapa	30	Biomass- wasteforest	96.56
Lumeje	30	Biomass- wasteforest	95.93
Dinge	30	Biomass- wasteforest	95.41
Total	8,491		11,346

1. The use of biomass as energy source: In Angola about 80% of the population, depend on biomass for their everyday energy purposes, i.e. water heating, cooking and lighting the majority of which are living in rural areas and utilizing biomass as firewood. The demand for wood for charcoal is, therefore, also a significant driver of forest degradation and, subsequently, the release of GHG emissions. Biomass consumption (wood-energy and agricultural residues) remains the main source of domestic energy, and energy in small-scale commercial sectors. This intense cutting of trees to produce and supply charcoal to the urban and periurban areas is putting an extreme pressure on the local resources. Two-thirds of the population in Luanda are living in periurban areas, and approximately 270,000 tons of charcoal are utilized in the capital city annually. Reducing the demand for firewood is, therefore, an important strategy to reduce drivers of deforestation and an exhaustion of Angola's natural resources. Considering that about 1 million tons of charcoal may be used annually in the country, the potential emission reduction from the production of charcoal is estimated **at more than 750,000 tCO₂/year and at approximate cost of around 300 million USD⁴.**

2. The agriculture sector: In addition to efforts to mitigate GHG emissions from the agriculture sector, the country intends to promote the use of biofuels, by producing ethanol and sugar, using the experience from Brazil. The objective is to cultivate and harvest 34 thousand hectares of sugarcane in the province of Malange, to process a capacity of 2.25 million tons of raw material per season. The country intends to produce 23 million liters of ethanol and 170 GW of power through co-generation by 2019. The budget is **between 540 million and 1 billion USD.**

3. The Forest Carbon Options: Angola possesses significant opportunities for initiating large-scale afforestation/reforestation activities, which hold several economic, social and environmental advantages while alleviating the pressure on natural forests. Afforestation and Reforestation of degraded forest lands and mangrove habitats have a strong potential for mitigation purposes. Angola is currently undertaking legislative reforms in the forestry sector, while FAO is assisting the Government of Angola in carrying out a national forestry assessment with the aim of producing comprehensive information on the state of forests in the country. Several large scale afforestation initiatives are currently being planned which includes 50 000ha to be planted in the 10 years; 140 000ha of eucalyptus to be planted in Huila province; 60 000ha of eucalyptus to be planted in the Province of Kuando-Cubango and 25 000ha about to be planted in Malange province in the next five years. Considering that the current cost of planting 1000 ha = 6 250 000 USD the approximate cost of these afforestation initiatives **will amount around 2 billion USD.**

4. Presently, the potential income from REDD+ projects in the country is considered to be substantial. Calculating the potential emission reductions from REDD+ activities in Angola demonstrates that there is mitigation potential if deforestation is avoided completely. Assuming that

⁴ <http://www.fao.org/docrep/x5555e/x5555e08.htm>

the baseline is entirely based on historical emissions, avoided emissions are calculated by multiplying the annual deforestation in Angola, estimated to be 124,800 ha per year (based on numbers from the period 1990-2010), by 82 tC/ha, which is the approximate amount of tons of carbon stored per ha in the country's forests. Avoiding deforestation, alone, in Angola has the potential to contribute to **more than 35 million tons in CO₂ emission** reductions every year. **The budget required is above 500 million USD.**

The Republic of Angola recognizes the roll that Carbon Market can play for the mobilization of resources and promotion of the development and transfers of climate friendly technology.

3. ANGOLA'S ADAPTATION CONTRIBUTION

This Adaptation Intended Contribution is included for the purposes of Information of other Parties and the Public that this is part of the country's intended climate actions, and it does not constitute international obligations of the country.

The Angolan economy has been hit hard by the impact of climate change expressed as prolonged drought, damaging flash floods, forest fires, reduced crop production, reduced water resources, impacted fishing resources, etc. Many of the economy sectors of Angola have been impacted by climate variability in the last thirty years, namely the Agriculture, Coastal Zone, Land-Use, Forests, Ecosystems and Biodiversity, Water resources, Health. However, there are economy sectors which are extremely vulnerable to impacts resulting from the extreme events and which will pose not only serious livelihood and direct health risks but can also affect the economic potential and national food security. The need for adaptation seems thus obvious. The vulnerability increases for higher temperature increases, so adaptation needs will depend on the expected temperature rise.

The Republic of Angola ratified the UNFCCC in 2000 and the Kyoto Protocol in 2007. Angola completed its National Adaptation Programme of Action (NAPA) in 2011. In 2012 Angola submitted its Initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC). Among the priorities identified in the NAPA, two policy measures are noteworthy: revise sectoral laws for proactive adaptation; national institutional mechanism for adaptation planning and mainstreaming. Accordingly, Angola has developed in recent years various national plans and strategies which include activities relevant to climate change, including the:

- *National Strategy for Climate Change* (2008);
- *National Afforestation and Reforestation Strategy* (2010);
- *Strategic Plan of Disaster Risk Management* (2011);
- *National Action Programme to fight Desertification* (2014);

and, above all, the *Strategy of Long-term Development for Angola (2025)*. Many of the actions envisaged in these plans and strategies, particularly in the energy sector, are linked to both adaptation and mitigation.

Objectives and Sectoral Intervention for Adaptation

Within the context of this INDC, Angola prioritises the implementation of Adaptation measures in the following main sectors:

1. Agriculture
2. Coastal Zone
3. Land-Use, Forests, Ecosystems and Biodiversity
4. Water resources
5. Health

Presentation of Unconditional Adaptation options

Angola acknowledges that climate change adaptation requires unconditional as well as conditional actions in order to reduce the vulnerability of communities against the expected Climate Change impacts. The unconditional actions (current) are listed below and its implementation costs amounts **to around 500 million USD at current price.**

Project Title	Description	Sector
Land Rehabilitation and Rangelands Management in Small Holders Agropastoral Production Systems in Soutwestern Angola (Project RETESA).	To enhance the capacity of southwestern Angola's smallholder agro-pastoral sector to mitigate the impact of land degradation processes and to rehabilitate degraded lands by mainstreaming SLM technologies into agro-pastoral and agricultural development initiatives.	Land rehabilitation, Agriculture
	Total project cost (US \$ million): 15.397	
	Implementing GEF agency: FAO	
Enhancing climate change resilience in the Benguela current fisheries system (regional project: Angola, Namibia and South Africa)	The project aims to build resilience and reduce vulnerability of the Benguela Current marine fisheries systems to climate change through strengthened adaptive capacity and implementation of participatory and integrated adaptive strategies in order to ensure food and livelihood security.	Fisheries. Agriculture and food security
	Total project cost (US \$ million): 16.520	
	Implementing GEF agency: FAO	
Promoting climate-resilient development and enhanced adaptive capacity to withstand disaster risks in Angola's Cuvelai River Basin	The project is focused on strengthening the capacity of national and sub-national entities to monitor climate change, generate reliable hydro-meteorological information (including forecasts) and to be able to combine this information with other environmental and socio-economic data to improve evidence-based decision-making for early warning and adaptation responses as well as planning.	Early warning systems. Disaster risk management
	Total project cost (US \$ million): 37.179	
	Implementing GEF agency: UNDP	
Integrating climate change into environment and sustainable land management practices	The project will disseminate sustainable land management and adaptation practices in agro-forestry and land ecology in 350 communities.	Agriculture and food security
	Total project cost (US \$ million): 24.831	
	Implementing GEF agency: AfDB	
Addressing urgent coastal adaptation needs and capacity gaps in Angola	Enhancement of coastal adaptive capacities at the institutional, systemic and community levels; response to urgent needs posed by climate change.	Coastal zones/Marine ecosystems
	Total project cost (US \$ million): 17.850	
	Implementing GEF agency: UNEP	
Disaster risk reduction/ management to support agropastoral communities affected by recurrent droughts and other natural disasters in southern Angola and northern Namibia (Project PIRAN)	The objective is to strengthen food security and DRR/M, and increase the resilience of agro-pastoral livelihoods by increasing capacity to manage risks related to natural disasters at the level of communities and local institutions. The expected results are: improved agricultural and livestock production, health and animal nutrition, soil and water management and management of early warning systems.	Disaster risk management. Agriculture and food security
	Total project cost (US \$ million): 1.600 (1.180 for Angola) for the first year	
	Implementing GEF agency: FAO Donor: United States of America (USAID/OFDA)	

Project Title	Description	Sector
Integrating Climate Resilience into Agricultural and Agropastoral Production Systems through Soil Fertility Management in Key Productive and Vulnerable Areas Using the Farmers Field School Approach	The project aims to strengthen the climate resilience of the agropastoral production systems in the key vulnerable areas of Angola of the Central Plateau (Bie, Huambo and Malanje). This includes mainstreaming Climate Change Adaptation into agricultural and environmental sector policies, programmes and practices, building capacity and promoting CCA through soil fertility and sustainable land management (SLM) practices by using the Farmers Field School (FFS) approach.	Agriculture and food security. Capacity building
	Total project cost (US \$ million): 32.143	
	Implementing GEF agency: FAO	
Promotion of Sustainable Charcoal in Angola through a Value Chain Approach	To reduce the current unsustainable and GHG-intensive biomass production and utilization from Angola's Miombo woodlands via an integrated suite of interventions in the country's charcoal value chain.	Renewable energy. Forestry
	Total project cost (US \$ million): 17.884	
	Implementing GEF agency: UNDP	
The "Solar Village" Programme	The "Solar Village" Programme, launched by the Executive under the National Development Plan (PND) 2013-2017, allowed to date the electrification of 48 villages in different regions of the country, benefiting 100,000 families. The goal of the Executive is to produce by 2025 about 100 megawatts of solar power to all rural areas, an investment estimated at \$ 150 million.	Renewable energy.
	Total project cost (US \$ million): 150 (to 2025)	
	Implementing Angolan Ministry: Ministry of Energy and Water. National Directorate of Renewable Energy.	
Construction of hydroelectric and thermal power plants	Construction of hydroelectric and thermal power plants (CaculoCabaça, Soyo ...) that will generate about five thousand megawatts, during the period 2013/2017.	Energy
	Implementing Angolan Ministry: Ministry of Energy and Water. National Directorate of Renewable Energy.	
Energy and Water Sector Action Plan 2013-017	A characterisation of the two sub-sectors, including infrastructure and the institutional component, which result in commonalities, e.g. the undersizing and operational inefficiency of the systems, the economic-financial imbalance of public enterprises and a lack of skills.	Energy. Water resources
	Total project cost (US \$ million): 29,170	

Presentation of Conditional Adaptation options

Adaptation options exist in all sectors, but their context for implementation and potential to reduce climate-related risks differ across sectors. Some adaptation responses involve significant co-benefits, synergies and trade-offs). The adaptation projects identified as priorities in the NAPA are listed in the following Table as well as costing to be expected for each of those options. The estimated cost of implementing the NAPA priority projects **amounts to over 500 million USD** if current inflation rates are applied to 2011 costing.

	PROJECT TITLE	PROJECT SECTOR	SECTOR COMPONENT(S)	PROJECT COST (USD)
1	Promote alternative renewable energies to avoid deforestation*	Energy	Renewable energy, Forestry	3,500,000*
2	Promote SLM for increased agricultural yields*	Agriculture and food security	Land rehabilitation, Agriculture	5,000,000
3	Ensure basic access to health services and health monitoring*	Health	Health	3,000,000
4	Study the vulnerability of the fisheries sector to climate change and current modifications*	Coastal zones/Marine ecosystems	Fisheries, Agriculture and food security	2,000,000
5	Extend electricity grid to rural areas*	Energy	Electricity provision	5,000,000
6	Revise sectoral laws for proactive adaptation			2,000,000
7	Create an early warning system for flooding and storms	Early warning system and disaster risk management	Early warning system	3,500,000
8	National institutional mechanism for adaptation planning and mainstreaming			2,000,000
9	Soil erosion control through organic methods	Terrestrial ecosystems		4,000,000
10	Diversify crops to less climate sensitive cultures	Agriculture and food security		3,000,000
11	Technology needs assessment			500,000
12	Locally available adapted seed varieties	Agriculture and food security		5,000,000
13	Climate monitoring and data management system	Early warning system and disaster risk management		17,500,000
14	Study the implication of climate change on disease patterns for humans and livestock	Agriculture and food security	Health	1,500,000
15	Increase water availability through village-level wells and boreholes	Water resources	Water availability and distribution	5,000,000
16	Implement water resources integrated management	Water resources	Water management	3,000,000
17	Map areas of erosion risk	Terrestrial ecosystems		1,000,000
18	Implement water-harvesting system in drought-prone areas	Agriculture and food security	Water resources	3,000,000
19	Improve knowledge of hydrology	Water resources		2,000,000
20	Extend water and sanitation network to rural areas	Water resources	Infrastructure	10,000,000
21	Explore industrial opportunities from climate change			1,000,000
22	Monitor groundwater	Water resources		3,000,000
23	Construct flood protection barriers along major rivers	Water resources	Disaster risk management	5,000,000
24	Study impacts of sedimentation and siltation rates on coastal processes	Coastal zones/marine ecosystems		3,500,000
25	Improve design and construction	Infrastructure		1,000,000

	PROJECT TITLE	PROJECT SECTOR	SECTOR COMPONENT(S)	PROJECT COST (USD)
	of buildings			
26	Study impact of climate change on hydroelectricity	Water resources	Energy	1,000,000
27	Revise building codes to promote retreat from flood plains and coastal zones			1,000,000
28	Construct sea level protection structure	Infrastructure	Coastal zones and marine ecosystems	10,000,000
29	Study impact of climate change on mining	Energy		500,000
**Total				107,500,000

* Priority project for which a project profile has been developed

**Not accounting for the inflationary impact of the 2011 costing exercise

4. FAIRNESS AND AMBITION

Angola is extremely vulnerable to the impacts of Climate Change and some specific regions of Angola such as the southern regions are already experiencing a regular worsening of droughts and floods, as well as coastal degradation and regional and national-level adaptation action plans are in place to address those sectors which have been particularly affected. The estimated global warming of 2°C would imply for Angola severe economic losses for Agriculture sector, a sector that contributes to over 8% of the country GDP and at threat to the stability of food security. The Government of Angola has been diverting own funds to carry out implementation of complementary initiatives addressing these Climate Change impacts.

In addition, Angola is the third-largest economy in Sub-Saharan Africa and a net exporter of fossil fuels, and by now the second largest oil producer in sub-Saharan Africa after Nigeria. According to the country's Initial National Communication (INC) report to the United Nations Framework Convention on Climate Change (UNFCCC) released in 2012 (but based on emission inventory statistics from 2005) Angola only contributed approximately with 66.8 million tons of CO₂e of Greenhouse Gas Emissions to the atmosphere. This contribution is meagre and represents a small percentage of current global GHG emissions. However, though showing **an insignificant contribution, at 0.1% of the total global emissions, while the per-capita emissions are 4.15 tons of CO₂e in 2005⁵ compared to the global average⁶**. Angola recognises that in order to meet the 2 degree objective all countries will need to undertake mitigation measures. In fact the Government of Angola has enacted a considerable amount of Laws and Policies as well has developed important sectoral studies which gives an idea of how determined the Government Authorities are to take the country to the forefront of African countries reducing their GHG emissions. Angola's approach focuses on avoiding an increase of emissions per capita beyond the current level, while pursuing its development goals. Through this INDC Angola is determined to reduce its emissions trajectory by **nearly 50% below the BAU scenario by 2030**. In selecting the actions outlined above, Angola has prioritised those which fit with the growth priorities set out in its national development plans in particular the Angola 2025 Policy Document. In addition, Angola has captured the synergies between mitigation and adaptation, not only by prioritising those adaptation activities with significant mitigation co-benefits but also by seeking to minimise the carbon footprint of its adaptation portfolio as a whole. Angola is therefore putting forward Mitigation actions as well as Adaptation measures with mitigation benefits amounting over **15,7 billion USD** that align with a low carbon development pathway, which to be fully implemented would require additional international support in the form of finance, technology transfer and capacity building.

5. MEANS OF IMPLEMENTATION

Angola's contribution will be implemented following the Government strategy set of pursuing the enforcement/execution of the already enacted laws and policies so to reduce the gap between the recent vigorous legislative activity and the real implementation of mitigation measures. Within this framework Angola has already engaged with Clean Development Mechanism by submitting a number of important large scale projects. This action will be complemented by the continuation of climate change mitigation/adaptation mainstreaming into the National Plans and Policies as well as the implementation of the National Strategy for the Implementation of UNFCCC and the Kyoto Protocol. This framework comprises: generating reports and inventories about GHG emissions in

⁵Ministry of Environment. Angola Initial National Communication. (2011) Under the United Nations Framework Convention on Climate Change (UNFCCC). 194 p.

⁶ GHG time series 1990-2012 per capita emissions for world countries http://edgar.jrc.ec.europa.eu/overview.php?v=GHGts_pc1990-2012

Angola and their impact on the environment and public health; producing programmes and projects with measures to mitigate climate change; developing technical and professional training actions in areas related to climate change; fostering international co-operation within the context of climate change, particularly in terms of transfer of knowledge, experience and technology. Therefore, Angola will address the clear shortness of human and technical capacity to keep abreast with the real situation of GHG emissions in the various sectors for which Angola will require support to implement capacity building and training at various level and sectors.

The overall preliminary cost of implementing the proposed Mitigation and Adaptation contributions amount to over **15.7 billion USD across sectors up to 2030**. Some of this amount has already been provided by the Government of Angola within the Unconditional Mitigation and Adaptation scenario. Therefore, the implementation of all the Conditional mitigation and adaptation contributions that the country endeavour to deliver will require international support in form of finance, investment, technology development and transfer, and capacity-building to fully accomplish the intended contributions.

6. SOCIO-ECONOMIC BENEFITS

The accomplishment of the mitigation and adaptation contributions being proposed in the Angolan INDC will undoubtedly bring important benefit for the wider communities and to the rural communities in particular, namely:

- The climate resilience program includes increasing hydropower plants and other renewable energy sources to provide electricity to rural communities and businesses, replacing diesel fuelled off grid generation.
- The implementation of the proposed contribution carries a huge potential of youth job creation in the country either through the local manufacturing/assembly of renewable energy machines/parts or through the forestation and afforestation programmes which demand for labour will be certainly a source of employment for the rural communities.
- The eventual support provided by the international community to Angola will strengthen the technical capacity of the country's human resources through assisted training and capacity building programmes.
- Finally, overall, both the mitigation and the adaptation actions offered as contribution in the Angolan INDC will certainly enhance the adaptive capacity of the rural population and consequently augmenting their resilience to climate change impacts.

7. GENDER PERSPECTIVE

The underlining policies supporting the implementation of the INDC mitigation and adaptation contributions and the actions to be implemented in this context include cross-cutting issues which are gender sensitive and therefore will take into account women as important decision makers regarding energy consumption in particular. Systematically, mitigation and adaptation measures offered in the Angolan INDC emphasize the importance of their implementation avoiding exacerbation of the impacts of climate change that already have disproportionate adverse effects based solely on gender, in particular in the agriculture, water resources and biomass energy sectors.



ANTIGUA AND BARBUDA

INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

Communicated to the UNFCCC on 15th October, 2015

Introduction

The Government of Antigua and Barbuda is committed to the successful conclusion of negotiations under the Ad-Hoc Working Group on the Durban Platform for Enhanced Action (ADP) in order to adopt, at COP21 in Paris, a new legally binding agreement under the United Nations Framework Convention on Climate Change (UNFCCC) appropriate to all Parties, which will come into effect and be implemented from 2020 onwards.

Antigua and Barbuda hereby communicates its Intended Nationally Determined Contribution (INDC), in accordance with the relevant paragraphs of Decisions 1/CP.19 and 1/CP.20, towards achieving the objective of the Convention to stabilize greenhouse gas (GHG) concentrations to “prevent dangerous anthropogenic interference with the climate system” (Article 2), and towards the Convention’s commitment for all Parties to take “measures to facilitate adequate adaptation to climate change” (Article 4).

As agreed in Decision 1 CP/20 para 11, “Small island developing states may communicate information on strategies, plans and actions for low greenhouse gas emission development reflecting their special circumstances in the context of intended nationally determined contributions.” Mitigation and adaptation targets in this INDC are presented in an up-front format to facilitate clarity and transparency, and are a mix of conditional and unconditional contributions, contingent upon receiving international support for technology transfer, capacity-building and financial resources.

Antigua and Barbuda reserves the right to revise this INDC prior to finalization and/or ratification under a new global climate agreement.

Intended Nationally Determined Contribution (INDC)

Conditional Adaptation Targets

1. By 2025, increase seawater desalination capacity by 50% above 2015 levels.
2. By 2030, all buildings are improved and prepared for extreme climate events, including drought, flooding and hurricanes.
3. By 2030, 100% of electricity demand in the water sector¹ and other essential services (including health, food storage and emergency services) will be met through off-grid renewable sources.
4. By 2030, all waterways are protected to reduce the risks of flooding and health impacts.
5. By 2030, an affordable insurance scheme is available for farmers, fishers, and residential and business owners to cope with losses resulting from climate variability.

Conditional Mitigation Targets

1. By 2020, establish efficiency standards for the importation of all vehicles and appliances.
2. By 2020, finalize the technical studies with the intention to construct and operationalize a waste to energy (WTE) plant by 2025.²
3. By 2030, achieve an energy matrix with 50 MW of electricity from renewable sources both on and off-grid in the public and private sectors.³
4. By 2030, all remaining wetlands and watershed areas with carbon sequestration potential are protected as carbon sinks.

Unconditional Targets

1. Enhance the established enabling legal, policy and institutional environment for a low carbon emission development pathway to achieve poverty reduction and sustainable development.
2. By 2020, update the Building Code to meet projected impacts of climate change.

Support for Implementation

The conditional adaptation and mitigation targets presented in this INDC are contingent upon Antigua and Barbuda receiving international support for capacity building, technology transfer

1 The water sector includes water generation (seawater desalination), distribution and usage, to ensure water delivery when grid electricity may be interrupted. Based on an informal assessment, water distribution and usage is equal to approximately 15% of GHG emissions in the electricity sector.

2 This waste to energy target is not considered part of the 50 MW renewable energy target.

3 This target includes distributive renewable energy capacity to be used as backup energy by the commercial sector and some residences. The assumption is that the commercial sector has full backup capacity of approx. 20 MW to continue business when electricity via the grid may be interrupted. Backup electricity generation is currently fossil fuel-based.

and financial resources, including through the Green Climate Fund (GCF), the Global Environment Facility (GEF), the Adaptation Fund and multilateral agencies and bilateral agreements. The cost of implementing the adaptation targets is estimated at approximately \$20M USD per year for the next ten years, and the cost of implementing the mitigation targets is estimated at approximately \$220M USD, however these figures require further analysis.

National contributions include establishing an enabling legal, policy and institutional environment to facilitate an efficient and effective transfer of resources to support implementation and achievement of the INDC targets. This enabling environment includes enactment of the Renewable Energy Act of 2015 and the Environmental Protection and Management Act (EPMA) of 2015, in addition to policies in energy and the environment such as the National Energy Policy and the Sustainable Energy Action Plan. National efforts have contributed to an enabling financing environment through the Sustainable Island Resource Framework Fund (SIRF Fund), which was established under national environmental law. The Fund’s executing agency, the Department of Environment, has achieved accreditation to the Adaptation Fund as a National Implementing Entity, and the Department is seeking direct access to the GCF.

INFORMATION TO FACILITATE CLARITY AND TRANSPARENCY

Parameter		Information
Period of implementation		Pre 2020 and 2020 – 2030
Type of commitment		We recognize that contributions from developed countries may be absolute economy-wide emission reduction targets relative to a base year, and that contributions from developing countries may be policies, measures and actions departing from business as usual. As a developing country, a small island developing state, and one of the lowest emitters in the world, Antigua and Barbuda presents conditional and unconditional policies, measures and actions (non-GHG target).
Reference point		Greenhouse Gas Emissions and Removals (Gg) for 2006
Scope and coverage	Emissions impact	Contributions will reduce GHG emissions in the energy sector, reduce dependence on fossil fuels, reduce the cost of energy and help alleviate poverty through increasing access to affordable and

		sustainable energy.
	Sectors	Sectors addressed in the adaptation and mitigation targets include: Energy, Health, Tourism, Agriculture, Waste, Water, Transportation, Forestry and Land Use Change.
	Greenhouse Gases (GHGs)	The national GHG inventory covers Carbon Dioxide (CO ₂), Methane (CH ₄), Nitrous Oxide (N ₂ O), and Hydrofluorocarbons (HFC).
	Geographical boundaries	Entire country
Intention to use market-based mechanisms to meet target		Antigua and Barbuda considers the establishment of an international market mechanism as an important complementary option to reduce total costs associated with limiting GHG emissions and to assist global efforts limiting temperature to 1.5 degrees Celsius above pre-industrial levels. Antigua and Barbuda acknowledges the potential for a renewed and reformed Clean Development Mechanism to fulfill this roll through its existing structure. The final mechanism should be a robust system that guarantees transparency and environmental integrity, and delivers real, permanent and verified emissions reductions and ensures that double counting is avoided.
Planning process		
<p>This initial draft INDC was developed through a Cabinet mandate, where the Cabinet of Antigua and Barbuda also reviewed the adaptation and mitigation targets. The Technical Advisory Committee (TAC), was the primary drafting and review committee in the development of this initial INDC. The TAC is an inter-agency, multi-stakeholder advisory committee that includes fifteen government agencies, three NGOs and community interest groups, and one private sector coalition representative.</p> <p>Additional consultations were arranged with public, private, and civil society stakeholders, through meetings, workshops, public awareness and online publication.</p> <p>Antigua and Barbuda recognizes the importance of Principle 10 of the Rio Declaration on transparency, access and accountability in environmental matters through participation of all concerned citizens, at the relevant levels, as well as to involve the community by encouraging public awareness and participation by making information readily available.</p>		

Antigua and Barbuda's INDC is a working document and will be updated periodically, as appropriate. This initial draft INDC will be supported by a technical road map and additional technical assessments to facilitate the drafting of policies, regulations, and standards for implementation.

Assumptions and Methodological Approaches

The full implementation of Antigua and Barbuda's INDC is made on the assumption of an ambitious and equitable multilateral agreement being reached among Parties that provides the means of implementation to enable Antigua and Barbuda to access international support through climate finance, and an agreement that stimulates investments, technology transfer and capacity building.

The methodologies used to estimate GHG emissions in relevant sectors correspond to the 2006 IPCC Guidance for Conducting National Greenhouse Gas Inventories and assume Global Warming Potential (GWP) values for a residence period in the atmosphere of 100 years pertaining to the Second Assessment report of the IPCC.

Consideration on Fairness and Ambition

Antigua and Barbuda's INDC is fair, ambitious, and science-based, and is therefore a responsible contribution toward the global efforts of meeting the objectives of the UNFCCC to limit the average temperature rise to 1.5 degrees Celsius above pre-industrial levels, and to enable and support the implementation of adaptation actions aimed at reducing vulnerability and building resilience in vulnerable countries.

The ambitious adaptation and mitigation targets presented in this INDC represent a national commitment towards addressing the global climate change challenge. Antigua and Barbuda's emissions are negligible in a global context (less than 0.002%), and as a small island developing state (SIDS) the country is highly vulnerable to climate trends and impacts. Antigua and Barbuda aspires to increase national resilience to climate change through implementing integrated mitigation and adaptation actions.

Antigua and Barbuda reaffirms its commitment to the AOSIS position that, "Research clearly shows that unless we act immediately, the opportunity to keep global warming below the crucial 1.5 degree Celsius threshold could be irrevocably lost." The country believes in the principle of common but differentiated responsibilities and respective capabilities (CBDR) to address the global climate challenge.

ACCOMPANYING INFORMATION ON ANTIGUA AND BARBUDA'S INDC

General Information

Antigua and Barbuda is a small island developing state (SIDS) in the Caribbean Sea with a population of 90,000, of which 1,200 people reside in Barbuda. The country's economy is heavily dependent on natural resources, low-lying coastal zones, and favorable climate conditions to support the tourism sector, which accounts for about 80% of output gross domestic product (GDP), about 70% of direct and indirect employment and 85% of foreign exchange earnings. Antigua and Barbuda is exposed economically, environmentally and socially to projected climate change impacts.⁴

Climate models for the Caribbean highlight the need for downscaled climate data. Temperature projections from a Regional Climate Model (RCM) indicate more rapid increases in temperatures over Antigua and Barbuda compared to the Global Climate Model (GCM), as the improved spatial resolution in the RCM allows the land mass of the larger Caribbean islands to be represented, whilst the region is represented only by 'ocean' grid boxes at GCM resolution. RCM projections indicate increases of 2.4°C to 3.2°C in mean annual temperatures by the 2080s.⁵ Analysis of climate change for the island also projects accelerated coastal erosion and inundation, lower average annual rainfall, increased rainfall intensity causing flooding and a likely increase in tropical storm intensity.

Accompanying Information on Adaptation Actions

Antigua and Barbuda's development strategy is guided by a national physical development plan, a requirement under the Physical Planning Act of 2003, and is periodically updated. In 2012, Cabinet approved the Sustainable Island Resource Management and Zoning Plan (SIRMZP) to serve as the updated national physical development plan, which presents a forward-looking strategic, national spatial development framework that addresses current development issues, and provides a platform for feasible private and public sector development initiatives, reflecting local cultural values and aspirations over the next twenty years. Complementing the SIRMZP strategy, the adaptation targets presented in this INDC are incremental efforts to the national physical development plan as the targets elevate ambition beyond development, to build resilience through adaptation interventions in preparation for projected climate impacts.

4 The CARIBSAVE Partnership, 2015. *Draft Vulnerability Impact and Adaptation Analysis in the Caribbean (VIAAC): National Vulnerability Analysis for Antigua and Barbuda*. Prepared with funding from UNEP-ROLAC.

5 The CARIBSAVE Partnership, 2012. *The CARIBSAVE Climate Change Risk Atlas (CCCRA): Climate Change Risk Profile for Antigua and Barbuda*. Prepared with funding from DFID and AusAID, p. 14.

Since the year 2001, Antigua and Barbuda has been up to date with its commitments to report to the UNFCCC and is now in the process of preparing its Third National Communication to the UNFCCC, to be presented by the end of 2015. Antigua and Barbuda has presented two National Communications, the first in 2001 and the second in 2011, which highlight climate change present and future impacts. The National Communications elaborate in detail the impact that climate change will have on weather- and climate-sensitive sectors. Antigua and Barbuda is currently developing its biennial update report (BUR), which will be submitted to the UNFCCC by the end of 2016.

Drought is a major concern for the country. Historically, the water sector in Antigua and Barbuda has been vulnerable to shortages as a result of droughts every 5 to 10 years coupled with contamination from saltwater intrusion that threatens groundwater supplies. Some wells have already been capped to address the issue of saltwater intrusion.⁶

Climate impacts will exacerbate freshwater scarcity. Antigua and Barbuda lie in a zone that is expected to receive 30-50% less average annual rainfall by 2090 compared to late 20th century norms.⁷ In the Caribbean, sea level rise has been observed at between 1.5 and 3 mm per year, which will increasingly put inland freshwater resources at risk of saline intrusion.

Adaptation in the water sector is of national priority. Desalination reliance has already grown to account for 60% of national water supply, and this is the most viable option for enhancing freshwater resources.⁸ During times of drought, desalination can account for up to 90% of freshwater supply. Antigua and Barbuda have the goal to, **by 2025, increase seawater desalination capacity by 50% above 2015 levels**, from approximately 5.4 million to over 8 million US gallons per day (GPD) to counteract freshwater scarcity in Antigua and Barbuda.

Given that desalination is the primary adaptation solution to Antigua and Barbuda's freshwater challenges, and that its ability to meet demand is contingent on a stable and uninterrupted energy supply, implementing resilience in energy systems for water resources is a critical adaptation measure. Off-grid renewable energy resources can enhance resilience in the water sector. **By 2030, 100% of electricity demand in the water sector and other essential services (including health, food storage and emergency services) will be met through off-grid renewable sources** to enhance resilience to drought and hurricanes.

6 The CARIBSAVE Partnership, 2012. *Climate Change Risk Profile for Antigua and Barbuda*, p. 36.; Environment Solutions Limited (ESL), 2014. *National Adaptation Strategy and Action Plan to Address Climate Change in the Water Sector in Antigua and Barbuda: Final Report*. An initiative of the ACP Group of States funded by the EU, November 30: p. 11.

7 The CARIBSAVE Partnership, 2015. *Draft National Vulnerability Analysis for Antigua and Barbuda*, p. 9.

8 ESL, 2014. *National Adaptation Strategy and Action Plan*, p. 174.

The need for adaptation in the water sector is not limited to freshwater supply. In recent years, the impact of floods in Antigua and Barbuda have become particularly acute, in part due to climate variability affecting the frequency and severity of storms and rainfall extremes, and to development that has increased impervious surface cover and constricted drainage.⁹ The health sector is exposed to climate impacts through vector borne diseases and the spread of water-borne illnesses, where trends suggest increases in Antigua and Barbuda.¹⁰ **By 2030, all waterways will be protected to reduce the risks of flooding and health impacts.**

Climate models projecting hurricane trends have generally determined that there will be an increase in intensity, if not frequency, of hurricanes in the Atlantic and Caribbean.¹¹ As such, hurricanes will pose an increasing threat to Antigua and Barbuda's economy. Over 15 years, between 1995 and 2010, six hurricanes resulted in economic losses and damages on the twin island state totaling US \$335 million (Hurricane Luis in 1995, Hurricane Georges in 1998, Hurricanes Jose and Lenny in 1999, Hurricane Omar in 2008, and Hurricane Earl in 2010).¹² Physical infrastructure in Antigua and Barbuda must be adapted to the dynamic threats of water scarcity, heavy rainfall events, and more intense storms and hurricanes. **By 2030, all buildings will be improved and prepared for extreme climate events, including drought, flooding and hurricanes.**

Physical adaptation measures will not always be enough to prevent significant loss and damage to the infrastructure and economy of Antigua and Barbuda. As a coastal economy, one-meter sea level rise (SLR) would impact 10% of major tourism resorts, all seaports, and 2% of major road networks in Antigua and Barbuda. The fisheries sector sustains significant losses during hurricanes, and will be negatively impacted by ocean acidification, SLR, and increasing sea surface temperatures. The recent annual influx of Sargassum seaweed to Antigua and Barbuda's windward shores, which may be a result of climatic factors, is an unanticipated slow onset event with significant economic repercussions in tourism and fisheries. The agricultural sector is also particularly vulnerable to climate impacts. A drought in 2010 resulted in an overall loss of crops by 15%, with some crops sustaining losses up to 50%, while later that year excessive rain incurred losses to the crop sector totaling US \$1 million.¹³ A loss and damage mechanism is integral to building resilience to climate change in Antigua and Barbuda. **By 2030, an affordable insurance scheme will be available for farmers, fishers, and residential and business owners to cope with losses resulting from climate variability.**

9 UN-HABITAT, 2011. *Antigua and Barbuda: National Urban Profile*, p. 23.

10 The CARIBSAVE Partnership, 2012. *Climate Change Risk Profile for Antigua and Barbuda*, p. 189.

11 *Ibid*, p. 28.

12 The CARIBSAVE Partnership, 2015. *National Vulnerability Analysis for Antigua and Barbuda*, p. 44.

13 The CARIBSAVE Partnership, 2012. *Climate Change Risk Profile for Antigua and Barbuda*, p. xxv.

Accompanying Information on Mitigation Actions

Without any known fossil fuel resources, Antigua and Barbuda relies almost exclusively on imported fossil fuels for energy: heavy fuel oil in electricity generation; gasoline and diesel in transport; and liquefied petroleum gas (LPG) for cooking. This has resulted in relatively high emissions and extremely high fuel costs. In 2006, Antigua and Barbuda's national emissions totaled 945.5 Gg CO₂, of which 92% were derived from fuel combustion in the energy sector.¹⁴ In addition, the cost of fossil fuel imports, valued at US \$165.4 million in 2013, or equivalent to 13.7% of the country's GDP, is a financial burden on the country's economy. The cost of electricity has risen to over US \$0.40 per kWh,¹⁵ and consumers in Antigua and Barbuda pay among the highest electricity prices in the world. High electricity rates inhibit adaptation strategies, such as energy intensive seawater desalination; the provision of essential services; small businesses and low- and middle-income households; and economic growth.

However, in recent years, Antigua and Barbuda has made important strides in its sustainable energy policy. A National Energy Policy (NEP) was approved in November 2011, serving as the main policy for renewable energy (RE) and energy efficiency (EE) development. The NEP sets out the national approach to achieving its vision that, "By 2030 Antigua and Barbuda will meet the needs of the present generation while safeguarding the environment and enabling future generations to meet their own energy needs. All citizens and residents will have access to affordable, efficient, socially responsible and reliable forms of energy". This strategic plan proposes to exploit local energy resources and reduce fossil fuel dependence.

In March 2013, Antigua and Barbuda released a Sustainable Energy Action Plan (SEAP), to foster energy conservation and efficiency, diversification of energy sources, sustainable energy consumption and generation as well as the utilization of renewable energy sources. In 2015, Parliament enacted the Renewable Energy Act of 2015, to establish a legal, economic and institutional basis to promote the use of renewable energy resources. Towards this end, Antigua and Barbuda will, **by 2030, achieve an energy matrix with 50 MW of electricity from renewable sources both on and off-grid in the public and private sectors.**

Domestic and industrial waste is a growing environmental concern in Antigua and Barbuda, whereas technological assistance could reverse this trend and create new opportunities. A preliminary review of annual waste streams to the sanitary landfill suggests that some 80,000 tonnes annually of feedstock could be available for conversion to energy if an appropriate

14 Government of Antigua and Barbuda (GoAB), 2013. *National Inventory of Greenhouse Gases for Antigua and Barbuda: Inventory Year 2006*. Draft Report, p. 4.

15 Samuel, H. A., 2014. *Antigua & Barbuda Renewables Readiness Assessment (RRA) Background Paper, Working Draft for discussion at RRA Experts & Stakeholders Workshop*. IRENA, p. 6.

facility were available, mitigating CO₂, N₂O and CH₄ emissions. Antigua and Barbuda's goal is to, **by 2020, finalize technical studies with the intention to construct and operationalize a waste to energy (WTE) plant by 2025.**

In 2006, land use change and forestry contributed 7% of national emissions.¹⁶ Land use change can be mitigated through removal of GHG emissions by carbon sinks. The Environmental Protection and Management Act of 2015 establishes the legal backing such that, "Where the area is protected as a carbon sink it shall follow the principles developed by the UNFCCC."¹⁷ **By 2030, all remaining wetlands and watershed areas with carbon sequestration potential will be protected as carbon sinks.**

In 2014, the transport sector consumed over one quarter of the country's fossil fuel imports, 20% of which were gasoline and 11% diesel.¹⁸ The NEP addresses this emissions sector by *inter alia* recommending the use of vehicles with higher fuel efficiency and lower emissions, and support for hybrid, flex-fuel for electric vehicles as national targets. Antigua and Barbuda aims to, **by 2020, establish efficiency standards for the importation of all vehicles and appliances.**

Consideration of INDC Mitigation/Adaptation Co-benefits

National circumstances highlight the country's exposure and vulnerability to climate impacts, and the ways in which mitigation actions, namely on and off-grid renewable energy, can increase resilience in critical sectors such as energy, water, health, and emergency services. Similarly, mitigation actions can have adaptation co-benefits. For example, expanding the protection of wetlands and watersheds to sink GHG emissions also serves as an adaptation strategy by enhancing water retention and reducing the risks of climate impacts, namely flooding and storm surge. Antigua and Barbuda recognizes the co-benefits of adaptation and mitigation in the area of low carbon development as an efficient and cost-effective strategy for sustainable development.

Additional Information on Support for Implementation

Antigua and Barbuda requires international support from multilateral and bilateral sources, including through the Green Climate Fund (GCF), the GEF and the Adaptation Fund, for capacity building, climate finance and technology transfer to be able to strengthen its current programs, policies and regulations, to develop and implement new initiatives, and to fully assess and

16 GoAB, 2013. *National Inventory of Greenhouse Gases*, p. 4.

17 GoAB, 2015. *Antigua and Barbuda Environmental Protection and Management Act of 2015*, Section 53(8).

18 Samuel, H. A., 2014. *RRA Background Paper IRENA*, p. 9.

address the impacts of climate change, as defined in the adaptation and mitigation targets. Additional activities requiring support for implementation include, *inter alia*:

- Technology, human resources and financial capacity assessment;
- Support for the development of a Technology Strategy and Road Map that includes repurposing, decommissioning, and disposing of stranded assets;
- Comprehensive assessment of the national costs of adaptation and mitigation;
- Elaboration of a National Adaptation Plan;
- Enhancing Measurement, Reporting and Verification (MRV) processes;
- Development of standardized baselines to assess and monitor the impacts of implementing INDC adaptation and mitigation initiatives;
- Support for data collection, storage and management; and
- Support for education, training, public awareness, public participation, public access to information, and international cooperation throughout implementation of the INDC targets.

Antigua and Barbuda expresses that this INDC is provisional and an updated version will be submitted upon the completion of the Technology Strategy and Road Map and following ratification of the Paris Agreement in December 2015.

ARGENTINE REPUBLIC
INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

(NON-OFFICIAL TRANSLATION)

According to Decisions 1/CP.19 and 1/CP.20, and taking into account the principles, provisions and structure of the United Nations Framework Convention on Climate Change (UNFCCC), the Argentine Republic is pleased to submit its Intended Nationally Determined Contribution (INDC).

Introduction

The impact that the planet suffers today requires taking immediate measures which imply large economic effort. Thus, countries that have not yet reached full development are those that suffer most from this phenomenon, despite not being the principal responsible. In this sense, climate change increases inequalities that already exist among different nations, creating a new barrier for the development of countries.

Resolving this problem requires the initiation of concrete action in the areas of adaptation, mitigation, as well as the provision of the means of implementation; however, for this to be possible, there must exist a reference framework agreed by all the countries of the world. For the purpose of reaching an agreement among countries that are so different, it is important, in the first place, to understand the differences that separate them, not only in their historical process but also in their current and future goals. This leads to the need to avoid increasing inequalities. Thus, the respect and full application of the principle of common but differentiated responsibilities is fundamental for the success of the process.

In this sense, it is necessary to consider that measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.

Climate change can be reverted if all countries in the world can articulate human and economic effort, without precedent in human history that can only be achieved if there exists a sincere political decision of all the world's governments.

National Circumstances

The Argentine Republic is located in the Southern and Western hemisphere. Its territory extends both in the American continent as in Antarctica, including the South Orkney Islands, other southern islands, and the Malvinas Islands.

Argentina is composed of 23 provinces and the Autonomous City of Buenos Aires, and includes the Malvinas Islands, the South Georgia Islands, the South Sandwich Islands, as well as the surrounding maritime space, which are an integral part of Argentina's national territory. The islands are illegally occupied by the United Kingdom of Great Britain and Northern Ireland and are the object of a sovereignty dispute between the two countries, recognized by the United Nations General Assembly, the United Nations Decolonization Committee, and other international organizations.

With a total of 40,117,096 inhabitants, about 90% of the country's population lives in urban areas. Buenos Aires province has the largest percentage of the population (39% of the total), followed by the provinces of Córdoba, Santa Fe and the Autonomous City of Buenos Aires. Some 31.92% of the population is concentrated in Buenos Aires Metropolitan Area, which comprises the Autonomous City of Buenos Aires and 26 municipal jurisdictions of Buenos Aires Province, in an area that is 0.50% of the national total.

Argentina has a very significant biodiversity resulting from the vast territory with a large range of latitudes and altitudes with different geomorphologic, climatic and edaphological characteristics, resulting from the presence of 18 eco-regions (15 continental, 2 marine y 1 in Antarctica).

Since 2003 Argentina has adopted an economic model which has allowed the virtuous articulation of economic growth and social inclusion. With the State active in the promotion of economic development, in supporting and creating jobs, and in income distribution, the majority of social indicators have evolved positively. In this sense, some of the achievements include: the creation of over 6 million jobs, the reduction of unemployment from 20.4% in 2003 to 6.6% 2015; increase in GDP dedicated to national social investment from 7.2% in 2004 to 13.9% in 2014; increase in GDP dedicated to retirement pensions from 3.4% in 2004 to 6.7% in 2014; increase in the rate of retirement pension coverage to above 96% of all retirement-age people; the creating of 16 new

National Universities; a 33% increase the number of university students between 2001 and 2014; and a reduction in the Gini coefficient from 0.534 in 2003 to 0.410 in 2015.

Vulnerability and impact of climate change

The geographic position of the country and its socioeconomic characteristics lead to a territory that is vulnerable to climate change and climate variability, a situation which has become evident in recent years as a consequence of repeated and growing extreme climate events, as well as in gradual changes that affected various regions of the country.

Studies undertaken by Argentine researchers show that in the period 1960-2010 there was an increase in the average temperature in most of Argentina, of about 0.5 °C, exceeding 1 °C in some parts of Patagonia; there was also an increase in the number of days with heat waves and a decrease in the number of frost days. Large increases in precipitation were observed in the East of the country causing floods with large socio-economic impact. There was a reduction in precipitation in semi-arid zones, specifically in the Andean region and a reduction in the stream flows of rivers in the Cuyo region.

With respect to the potential impact of climate change for the rest of the XXI Century, it is worth noting that an increase in average temperature of 0.5 to 1 °C is projected for almost all of the country by the middle of the current century; this implies an acceleration of warming compared to the last 50 years. With respect to average precipitation, the changes in the next decades are not important, although an increase in the frequency of intense precipitation events are projected.

The vulnerability to climate change is important considering that agriculture and animal husbandry occupy an important place in the country's economy. This fact becomes even more relevant considering that Argentina is a major global player in food production and supply, playing a fundamental role in global food security.

Greenhouse gas (GHG) emissions profile

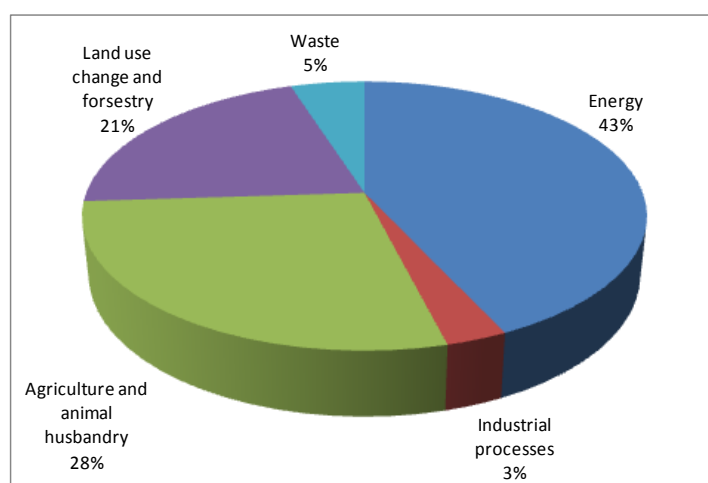
In analyzing the country's GHG emissions profile, one should consider the following:

- a) The high energy consumption related to transport in a country which has a large territory;
- b) The sustained increase in energy consumption in the residential sector is a consequence of a general policy of social inclusion, one of whose aspects is to guarantee universal access to energy under equitable conditions, as a determining element in the quality of life of its inhabitants;

- c) The sustained increase in energy consumption in productive sectors as an undeniable strategic input for economic development and job creation;
- d) Food production to satisfy the growing world demand, contributing to guarantee global food security.

According to the results of Argentina’s Third National Communication on Climate Change, GHG emissions are estimated to be of the order of 429 M ton CO₂-eq for the last national inventory of greenhouse gas emissions. The emissions distribution in the different sectors is shown below:

Distribution of GHG emissions, by sector



Adaptation and mitigation efforts realized

Argentina has participated actively in the process of generation and development of the international climate regime, specifically with respect to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. Moreover, Buenos Aires City hosted two Conferences of the Parties: COP 4 in 1998 and COP 10 in 2004.

Since then, the country has implemented voluntary national actions in mitigation and adaptation in different sectors. Nevertheless, with the objective of facing the challenge of climate change in the most efficient and articulated manner, Argentina designed the “National Strategy on Climate Change” and, within this institutional framework, a coordinating entity, “Governmental Committee on Climate Change” was created, for the participation of national and provincial state representatives.

In the energy sector two central policy objectives were defined: the diversification of the energy matrix and the promotion of rational and efficient use of energy. In this sense, the country has a

regulatory structure with strategic long-term plans that promote, among other measures, a larger participation of non-conventional renewable sources, hydroelectricity, nuclear power, and the replacement of fossil fuels by biofuels. Moreover, a set of programs and actions intended to reduce energy consumption intensity has been established.

In the transport sector, the optimization of rail transport system is conceived in a search for sustainability linked to climate change mitigation actions. In this sense, Law No. 27,132 constitutes an important regulatory framework that declares railways to be of national public interest and a priority objective for Argentina, comprising the reactivation of passenger and cargo railways, the renewal and improvement rail infrastructure and incorporation of technologies and services that contribute to the modernization and efficiency of the rail public transport system.

In the sector of agriculture, forestry and other land use (AFOLU), among other measures, Law No. 26,331 for the Environmental Protection of Native Forests established minimum budgets for environmental protection for the enrichment, restoration, conservation, harvesting and sustainable management of native forests, and for the environmental services that these provide to society. This institutional framework permitted the provinces to develop the process of land management of existing native forests according to sustainability criteria and establishing different conservation categories as a function of the environmental value of different native forest units and the environmental services they provide. Within this framework, the National Fund for the Enrichment and Conservation of Native Forests was created as a means to implement mechanisms for compensating the private sector with the objective of enriching, conserving, restoring, and promoting the sustainable management of these forests.

A variety of initiatives have been adopted in the same sector to allow an increase in food production, reducing environmental impact, including the development of varieties that allow a decrease in the use of pesticides, resistance to water stress, introduction of changes in sowing dates, and the development of irrigation systems to compensate for periods of water shortage, the introduction of land cover practices as well as early warning systems.

Moreover, no-till agriculture, combined with adequate fertilization and crop rotation proved central to the strategy to face climate change, through measures that have allowed soil moisture retention and improved soil structure and fertility. Other measures incorporated to the practices are precision agriculture, development of biomass energy, promotion of organic agriculture, as well as the planting and sustainable management of forest plantations.

With the objective of reducing the risks from the impact of climate change, Argentina analyzed climate model runs in order to project changes in its territory over the next 100 years. In the same sense, complex tools such as “Hydraulic Infrastructure Trust”, “National Glacier Inventory”, as well as the aforementioned “National Fund for the Enrichment and Conservation of Native Forests”, and “National Biodiversity Strategy”, among others, were established. Spaces for inter-institutional articulation to promote reduced disaster risks, such as the “National Platform for the Reduction of Disaster Risks” and the “Risk Management Study Commission” were also created.

Finally, given that social vulnerability is a determining risk factor for climate change impact, policies for improving people’s living conditions, undertaken within a framework of growth with social inclusion, would strengthen their capacity for adaptation.

Process for the preparation of the national contribution

The national contribution presented here is the result of a technical and political process initiated within the framework of the Governmental Committee and the National Strategy on Climate Change. An essential input to the process were the studies prepared within the framework of the Third National Communication which included an updated national GHG inventory, the identification of national mitigation potential, the development of climate change scenarios, the identification of the impact and vulnerability to climate change, and adaptation measures to face them.

Both the Third National Communication as well as the National Contribution are the result of a participative process, which included the vision, opinions, and proposals of public, private, and scientific and technical sectors, and civil society organizations, through numerous meetings, workshops and surveys.

The consultative process with different actors permitted the analysis of mitigation and adaptation measures identified in the Third National Communication and thereby, to determine the mitigation potential, as well as adaptation measures.

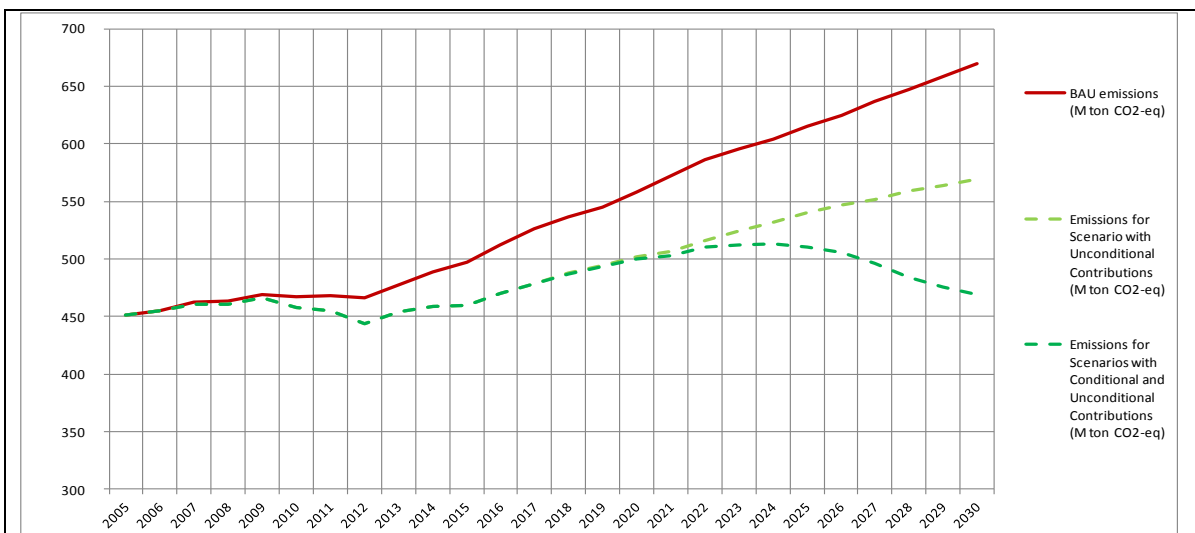
Fair and Ambitious

The national contribution is fair and ambitious, it is based on a process that took years, and that has implied the development of knowledge, institutional framework and specific measures. The priority of the Argentine Republic is to continue in the path of development with social inclusion that would allow improved well-being for all sectors of the population, especially those most

vulnerable. The contribution was determined through the identification of mitigation and adaptation measures that are linked to this objective. Moreover, Argentina’s current share of global emissions and its contribution to global food security have been considered.

Argentina has identified a mitigation potential that would allow it to contribute to combating climate change. A part of this potential can be achieved with great economic and social effort from all Argentines, but in order to reach the full potential, means of implementation should be available.

<p>Unconditional Goal</p>	<p>Argentina’s goal is to reduce GHG emissions by 15% in 2030 with respect to projected BAU emissions for that year. The goal includes, inter alia, actions linked to: the promotion of sustainable forest management, energy efficiency, biofuels, nuclear power, renewable energy, and transport modal shift. The criteria for selecting the actions include the potential for reducing /capturing GHG emissions and associate co-benefits, as well as the possibility of applying nationally developed technologies.</p>
<p>Conditional Goal</p>	<p>Argentina could increase its reduction goal under the following conditions: a) Adequate and predictable international financing; b) support for transfer, innovation and technology development; c) support for capacity building.</p> <p>In this case, a reduction of 30% GHG emissions could be achieved by 2030 compared to projected BAU emissions in the same year. The goal contemplates both the increase of the scope of measures in progress, as well as the implementation of new measures. In most cases, the costs and benefits of the measures have been analyzed. The criteria for selecting the actions include the potential for reducing /capturing GHG emissions and associate co-benefits, as well as the possibility of applying nationally development technologies.</p>



Type of goal	Percentage reduction in absolute emissions with respect to a “Business as usual” (BAU) trend scenario.
Goal Period	2030
Baseline	The baseline “Business as usual” (BAU) scenario was built from a projection of economic growth in the absence of climate change mitigation policies. The projection starts in year 2005 with GHG emissions of 670 M ton CO ₂ -eq in year 2030.
Scope and Coverage	
Sectors	The entire national territory is considered, including the following sectors: Energy; Agriculture; Waste; Industrial Processes; Land use change and forestry.
GHG	The contribution contemplates six greenhouse gases: Carbon dioxide (CO ₂); Methane (CH ₄); Nitrous oxide (N ₂ O); Hydrofluorocarbons (HFC); Perfluorocarbons (PFC); and Sulfur Hexafluoride (SF ₆).
Methodology	Inventories according to IPCC (1996) Guidelines. Global Warming Potential (GWP) values according to the IPCC Second Assessment Report (SAR).
Adaptación Needs	Argentina considers that adaptation to climate change is its principal priority, taking into account that the adverse effects of this phenomenon are already suffered in the national territory. In this context, it has implemented, with its own resources, a set of actions in this area. Nevertheless, and depending on the support received in the form of

	<p>international finance, technology development and transfer and capacity building, it could extend and deepen its adaptation actions, inter alia, in the following areas:</p> <ul style="list-style-type: none">a) The intensification and increase in early warning systems for intense rains, floods, heat waves, and systems for response to and recovery from climate disasters;b) The enrichment, conservation, restoration, improvement, and sustainable management of native forests;c) The increase in irrigated crop area and improvement in water resource management;d) The improvement in decision making on crop management;e) The reduction in vulnerability and strengthening of processes in health management related to the direct and indirect impact of climate change;f) The implementation of structural and non structural measures to face extreme events; andg) The promotion of biodiversity conservation and Adaptation based on Ecosystems. <p>In most of these cases, the measures have been identified with cost/benefit analyses undertaken.</p>
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Disclaimer

Nothing in this contribution can be interpreted as Argentina is making commitments that are not included in the objective, principles and provisions of the United Nations Framework Convention on Climate Change, especially with regard to food security and the principle of common but differentiated responsibilities.

Depending on the outcome of negotiations on climate change aimed to adopt a new agreement at COP 21, Argentina reserves the right to make revisions to this intended nationally determined contribution.



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MINISTRY OF NATURE PROTECTION OF THE REPUBLIC OF ARMENIA

MINISTER

МИНИСТЕРСТВО ОХРАНЫ ПРИРОДЫ РЕСПУБЛИКИ АРМЕНИЯ

МИНИСТР

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N° 1/08.1/12048

« 22 » « 09 » 2015թ.

To: Ms. Christiana Figueres
UNFCCC Executive Secretary
P.O. Box 260124
D-53153 Bonn
Germany
E-mail: secretariat@unfccc.int

Dear Ms. Figueres;

The Ministry of Nature Protection of the Republic of Armenia presents its compliments to UNFCCC Secretariat and has the honor to inform that the Republic of Armenia as a developing country and Non-Annex I Party to United Nations Framework Convention on Climate Change (UNFCCC) and a Party to Kyoto Protocol to UNFCCC has developed the Armenia's Intended Nationally Determined Contributions.

The document has passed public hearings and was approved by the Government Protocol Decision N41 on 10 of September 2015.

The Ministry of Nature Protection of the Republic of Armenia avails itself of this opportunity to renew to the UNFCCC Secretariat the assurances of its high consideration.

Enclosed (6 page).

Sincerely,



Aramayis Grigoryan



Protocol Decision No 41, 10 September, 2015

Government of the Republic of Armenia

**On approving the Intended Nationally Determined Contributions of the
Republic of Armenia under the UN Framework Convention on Climate Change**

To approve Intended Nationally Determined Contributions of the Republic of Armenia under the UNFCCC according to the following Annex.

Intended Nationally Determined Contribution of the Republic of Armenia under the UN Climate Change Framework Convention

1. The Republic of Armenia ratified the UN Framework Convention on Climate Change (UNFCCC) in May 1993 as a developing country not included in Annex I to the Convention. In December 2002, Armenia ratified the UNFCCC Kyoto Protocol.
2. The geographical location of the Republic of Armenia (landlocked mountainous country with vulnerable ecosystems), and the country’s need to ensure its national security, necessitates the prioritization of climate change adaptation.
3. The Republic of Armenia stated its position on the limitation of greenhouse gas emissions in subsequent national communications to the UNFCCC and in the Republic of Armenia’s Statement on Association with Copenhagen Accords:
 - 1) In relation to low carbon development Armenia describes the term ‘fairness’ by applying the UNFCCC definition of ‘common, but differentiated responsibility’, which considers the different levels of historical responsibility among countries in contributing to the increase of greenhouse gas concentration in the atmosphere, leading to climate change.
 - 2) The climate change mitigation actions should not reverse the social and economic trends, but contribute to the socioeconomic development of the Republic of Armenia. These actions must be based on an ‘ecosystem approach’, which is preferred by the Republic of Armenia, since it allows to maximize the synergies between mitigation and adaptation actions in most sectors of the economy, facilitating fair regional cooperation and contributing to solidarity.
4. Intended Nationally Determined Contributions (INDC):

1.	INDC underlying principles	<ol style="list-style-type: none"> 1) Limit global greenhouse gas (GHG) emissions to such a level that the global average temperature does not exceed 2⁰C, 2) Ensure distribution of the GHG emissions limitation burden between countries based on the principle of equity, taking into account the rights of present and future generations to use resources, and the equal rights of humans to impact the climatic system. 3) Apply an ecosystem-based approach to mitigation and adaptation actions, giving preference to balanced and combined actions. 4) The Republic of Armenia stays in the status of non–Annex I developing country under UNFCCC, and is prepared to undertake certain quantitative contribution to limit its GHG emissions growth based on the above mentioned principle of equity, and subject to adequate financial, technological and technical support. 5) The INDC shall be based on the principle of ‘Green economy’ and be compatible with the social and economic development goals of the Republic of Armenia.
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2.	<p>Mitigation of climate change</p>	<p>1) Applied definitions</p> <p>a. GHG emissions limiting volume - the total volume of GHG emissions, which ensures the limitation of an increase in the average global atmosphere temperature to below 2°C, according to the IPCC Fifth Assessment Report this is equal to 1.000 giga tons (Gt) carbon dioxide equivalent.</p> <p>b. GHG neutral emissions volume - the total annual volume of GHG emissions, which can be fully absorbed by the earth's ecosystems (ocean, land vegetation, soil) and be irreversibly accumulated in the ecosystems (around 11 Gt/year) carbon dioxide equivalent.</p> <p>2) Calculation basis</p> <p>a. The 'GHG limitation quantitative indicator' is calculated based on the per capita emissions of the global population,</p> <p>b. For global population consider the fixed estimate as of 1990, equal to 5.3 billion people (3.35 million was the Republic of Armenia's population in 1990),</p> <p>c. The per capita emissions limiting volume on the global level equals to 189 tons/per capita (1.000 Gt/5.3 billion people),</p> <p>d. To set the total aggregate quantitative contribution of the Republic of Armenia under INDC equal to 633 million tons carbon dioxide equivalent (189 tons per capita x 3.35 million people) for the period of 2015-2050 or an annual average of 5.4 tons per capita. In 2010, Armenia's GHG emissions comprised 2.14 tons per capita.</p> <p>The Republic of Armenia strives to achieve ecosystem neutral GHG emissions in 2050 (2.07 tons/per capita annual) with the support of adequate (necessary and sufficient) international financial, technological and capacity building assistance.</p> <p>In case of non-exceeding its total emissions quota (633 million tons) set for the period of 2015-2050 Armenia can credit non-utilized reduction to 'carbon market', or transfer it to the balance of emissions limitation envisaged for the period of 2050-2100.</p> <p>3) Timeframe</p> <p>The timeframe for the INDC is 2015-2030, including:</p> <p>a) 2015-2019 – the period of voluntary preparatory contributions. Accept those contributions, beyond the INDC start date in 2020, as «ambitious actions» in accordance with the development index of the Republic of Armenia, stated by forecast "mitigation measures" scenario of the Third National Communication to UNFCCC". The scenario includes commitments undertaken by the city authorities of the country under the Covenant of Mayors.</p> <p>b) 2020-2050 – the period of contribution under the new</p>
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UNFCCC agreement.

c) 2030 - interim review of the mitigation regime, taking into account possible changes of indexes mentioned under Para 2, points 2) a and b.

4) The main sectors included in the mitigation contribution are:

- a. Energy (including renewable energy and energy efficiency)
- b. Transport (including development of electrical transport)
- c. Urban development (including buildings and construction);
- d. Industrial processes (construction materials and chemical production)
- e. Waste management; (solid waste, waste water, agricultural waste),
- f. Land use and Forestry (afforestation, forest protection, carbon storage in soil)

Consider 20.1 per cent as an optimal forest cover indicator of the territory of the Republic of Armenia according to the Armenia`s First National Communication to UNFCCC (1998) and Government Decision No 1232 of 21 July 2005 "On Adoption of the National Forest Program of the Republic of Armenia". To achieve that indicator by 2050 and consider the obtained organic carbon absorptions and accumulations in the INDC and expand the impact period up that measure till 2100.

Ensure organic carbon conservation, accumulation and storage in all categories of lands through comprehensive measures and include achieved balance in the INDC.

Apply the Nationally Appropriate Mitigation Actions (NAMA) format: as well as national and international Measuring Reporting and Verification (MRV) system for implementation of INDC mitigation component.

5) Greenhouse gases considered:

Define that considered greenhouse gases are:

- a. Carbon dioxide (CO₂),
- b. Methane (CH₄),
- c. Nitrous oxide (N₂O),
- d. Hydrofluorocarbons (HFCs)

The emissions and absorption of mentioned gases are calculated in CO₂ equivalent, according to the "global warming potential" defined by IPCC Second Assessment Report ".

3.	Adaptation to climate change	<p>Basis and approaches to adaptation:</p> <p>1) Adaptation strategy and contributions are based on the requirement of the UNFCCC Article 2 “Objective”, which stipulates to restrain climate change within timeframe sufficient to allow ecosystems to adapt naturally to climate change. Thus, the natural ecosystems adaptation approach in INDC is considered pivotal for Armenia’s adaptation strategy and actions (contributions), and a basis for the development of the national adaptation plan.</p> <p>2) The Republic of Armenia embraces the ecosystem approach for adapting to climate change. The approach is in harmony with the environmental policy of the country, can ensure synergy with other international environmental conventions and treaties, will lay the ground for inter-sectoral coordination, and will support establishment of cross-border cooperation and solidarity environment.</p> <p>3) Adaptation activities will be prioritized based on the most vulnerable sectors to climate change:</p> <ul style="list-style-type: none"> a. Natural ecosystems (aquatic and terrestrial, including forest ecosystems, biodiversity and land cover) b. Human health c. Water resource management d. Agriculture, including fishery and forests e. Energy f. Human settlements and infrastructures g. Tourism
4.	Technology transfer	<p>Ensure adequate technological assistance and create a favorable environment for technology development and transfer.</p> <p>Establish institutional mechanisms to overcome barriers for the introduction of innovative technologies for climate change mitigation and adaptation, including strengthening the system of legal protection of intellectual property right.</p> <p>Ensure an open and transparent system of technology introduction and transfer as a contribution to the INDC, such as through the cooperation and experience exchange with "Climate Technology Center and Network" (CTCN) and through the establishment of a similar mechanism in the country (ArmCTCN).</p>
5.	Capacity strengthening	<p>Strengthen the operations of Intergovernmental Council on Climate Change, established by the Decision No 955 of the Prime Minister of the Republic of Armenia of 02 October 2012 and its Working Group.</p> <p>Establish consistent process for professional training and education on climate change-related issues, as well as enhance cooperation at the international and regional levels.</p>
6.	Finance	<p>Develop an appropriate legislative and institutional framework for adequate financial assistance. For this purpose a targeted financial mechanism consisting of two components should be created to</p>

		<p>finance climate change mitigation and adaptation projects:</p> <ol style="list-style-type: none"> 1) The first – internal (domestic) climate revolving civil fund, to be replenished on permanent base by allocations from environmental fees, ecosystem service fees, including "carbon taxing". 2) The second –external (international) financial mechanisms with resource provision following the principle of additionality, such as the Green Climate Fund, the Adaptation Fund, the Global Environmental Facility, bilateral and multilateral funds, and other sources. <p>The emerging financial mechanism will:</p> <ol style="list-style-type: none"> a. Create realistic and operational grounds for establishment and development of the reliable public- private partnership (PPP), b. Ensure the right of future generations to ‘use climate resources’.
7.	Transparency	<p>Transparency of mitigation and adaptation actions will be ensured through:</p> <ol style="list-style-type: none"> 1) The introduction of national and international MRV system, 2) Open and accessible information system, participatory process. <p>The open and transparent cooperation between public service providing bodies and civil society organizations ensured through establishing and strengthening effective legal incentives.</p>



AUSTRALIA

Australia's Intended Nationally Determined Contribution to a new Climate Change Agreement | August 2015

I. Australia's commitment

Australia wants the United Nations climate change conference in Paris to deliver a strong and effective new global climate change agreement, applicable to all UNFCCC Parties.

Australia has a strong record of meeting our commitments, and we are on track to meet our 2020 target. Our direct action policy, including the Emissions Reduction Fund, is supporting businesses and the community to reduce emissions, while improving productivity and sustaining economic growth.

Australia will continue to play our part in an effective global response to climate change. Under a Paris Agreement applicable to all, Australia will implement an **economy-wide target to reduce greenhouse gas emissions by 26 to 28 per cent below 2005 levels by 2030**. The details of Australia's contribution are set out in the attachment to aid transparency, clarity and understanding.

Australia's target is unconditional based on assumptions set out in the attachment. We will implement the 28 per cent target should circumstances allow, taking into account opportunities to reduce emissions and factors such as the costs of technology. Australia reserves the right to adjust our target and its parameters before it is finalised under a new global agreement should the rules and other underpinning arrangements of the agreement differ in a way that materially impacts the definition of our target.

II. A fair and ambitious contribution to deliver the Convention's objective

Australia's intended nationally determined contribution is an ambitious, fair and responsible contribution to global efforts toward meeting the objective of the UNFCCC with the goal of limiting global average temperature rise to below two degrees Celsius.

The target is a significant progression beyond Australia's 2020 commitment to cut emissions by five per cent below 2000 levels (equivalent to 13 per cent below 2005 levels). The target approximately doubles Australia's rate of emissions reductions, and significantly reduces emissions per capita and per unit of GDP, when compared to the 2020 target. Across a range of metrics, Australia's target is comparable to the targets of other advanced economies. Against 2005 levels, Australia's target represents projected cuts of 50 to 52 per cent in emissions per capita by 2030 and 64 to 65 per cent per unit of GDP by 2030.

The target represents serious and ambitious effort for Australia. This effort takes account of Australia's unique national circumstances, including a growing population and economy, role as a leading global resources provider, our current energy infrastructure, and higher than average abatement costs. The target places Australia on a stable pathway towards longer term emissions reductions in the context of future global action and technological innovation.

III. Planning processes towards achieving Australia's target

Australia's Emissions Reduction Fund supports Australian businesses to reduce emissions while improving productivity. The first auction under the Fund was held in April 2015, and successfully purchased over 47 million tonnes of abatement at an average price of AU\$13.95. The Government is finalising a safeguard mechanism to ensure emissions reductions purchased under the Fund are not offset by significant rises in emissions elsewhere in the economy. Australia has additional policy measures in place to promote the deployment of renewable energy and improve energy efficiency. Under Australia's Renewable Energy Target scheme, over 23 per cent of Australia's electricity will come from renewable sources by 2020.

The Australian Government is working to build climate resilience and support adaptation to climate change. Australia will develop a National Climate Resilience and Adaptation Strategy during 2015.

The Australian Government is commencing the development of a range of policies that will reduce emissions into the post-2020 period, including a National Energy Productivity Plan with a National Energy Productivity Target of a 40 per cent improvement between 2015 and 2030, the investigation of opportunities to improve the efficiency of light and heavy vehicles, and the enhanced management of synthetic greenhouse gas emissions under ozone protection laws and the Montreal Protocol.

Building from these measures, the Australian Government will in 2017-2018 undertake consultation to determine further post-2020 domestic emissions reduction policies. The Government will ensure that policies used in the post-2020 period are efficient and complementary with one another, and are appropriately calibrated towards achieving Australia's 2030 target. As a part of this process, the Government will consider a potential long term emissions reduction goal for Australia, beyond 2030, taking into account international trends and technology developments.

Attachment: Australia's intended nationally determined contribution

Target: 26 to 28 per cent below 2005 levels by 2030

<i>Reference point</i>	
Base year	2005
<i>Time frames</i>	
Period covered	2021 – 2030
<i>Scope and Coverage</i>	
Target type	Absolute economy-wide emissions reduction by 2030, to be developed into an emissions budget covering the period 2021-2030
Gases covered	Carbon dioxide (CO ₂); Methane (CH ₄); Nitrous oxide (N ₂ O); Hydrofluorocarbons (HFCs); Perfluorocarbons (PFCs); Sulphur hexafluoride (SF ₆); Nitrogen trifluoride (NF ₃)
Sectors covered	Energy; Industrial processes and product use; Agriculture; Land-use, land-use change and forestry; Waste
% of base year emissions covered	100 per cent of greenhouse gas emissions and removals in Australia's national greenhouse gas inventory
<i>Assumptions and methodological approaches for emissions estimates and accounting</i>	
Metrics	Australia intends to apply 100 year Global Warming Potentials (GWPs) as contained in inventory reporting guidelines, currently IPCC Fourth Assessment Report 100 year GWPs, or as otherwise agreed.
Emissions estimation methodology	Australia intends to apply the IPCC 2006 Guidelines and IPCC 2013 Revised Supplementary Methods, or as otherwise agreed.
Accounting approach	Australia intends to account based on UNFCCC inventory reporting categories using a net-net approach. Australia will apply IPCC guidance for treatment of natural disturbance and variation. Australia's INDC assumes that accounting provisions under the Paris agreement will: <ul style="list-style-type: none"> - Preserve the integrity of the agreement by ensuring claimed emissions reductions are genuine and are not double counted; and - Recognise emissions reductions from all sectors.
Australia reserves the right to adjust our target and its parameters before it is finalised under a new global agreement should the rules and other underpinning arrangements of the agreement differ in a way that materially impacts the definition of our target.	



INFORMATION

to the United Nations Framework Convention on Climate Change (UNFCCC) on the Intended Nationally Determined Contribution (INDC) of the Republic of Azerbaijan

As a developing country, Republic of Azerbaijan believes that the climate change is a potential threat for humanity and supports the adoption of a new Global Agreement on climate change to be applied to all Parties in the 21st Conference of Parties to the UNFCCC to be held in Paris late 2015.

By 2030 the Republic of Azerbaijan targets 35% reduction in the level of greenhouse gas emissions compared to 1990/base year as its contribution to the global climate change efforts.

Approaches and principles applied for defining the contributions:

Compliance with national conditions and historical responsibility

By communicating its INDC to the UNFCCC, Azerbaijan confirms the importance of a new agreement in the field of climate change and expresses its solidarity with the countries that are most vulnerable to climate change.

Azerbaijan believes that the exchange of information between the Parties on the INDC will assist in streamlining joint efforts aimed at the prevention of global temperature increase above 2°C as it is stated in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), as well as further promote the principles of justice by taking into account the potential and national circumstances of the Parties and their capacity.

When Azerbaijan was part of the former Soviet Union environmental concerns were neglected for the sake of industrial development.

The Armenia-Azerbaijan conflict resulted in the occupation of 20% of the territory of Azerbaijan by Armenia and the inflow of a million refugees and Internally Displaced Persons (IDPs). In addition, the conflict inflicted heavy damage on the environment of Azerbaijan. 1.7 million hectares of land that currently remain under Armenian occupation are comprised of 595.6 thousand hectares of agricultural land, 247.4 thousand hectares of forest area and 10.1 thousand hectares of farmland. 247.352 hectares of forest area, including 13197.5 hectares of rare and valuable forests, 152 natural monuments and 5 geological objects located in the occupied territories have been destroyed. Large scale arsons regularly committed by the Armenian military forces in the occupied territories seriously damage environment and livelihoods in adjacent districts as well as in the entire region. The inflicted damage amounts to billions of US dollars.

The principle of justice and ambition, obstacles and risks

As a developing country Azerbaijan is highly vulnerable to the effects of climate change. National greenhouse gas emissions account for only 0.1% of global emissions, while per capita gas emissions for 2010 equal 5.4 tons of CO₂ equivalent.

Despite the existing challenges, as a developing country Azerbaijan, has already provided its contribution to the global efforts to cope with climate change and has chosen its development direction towards low emission development that requires more financial resources. Therefore, the submitted INDC presents a highly **ambitious commitment**.

The increase of the population of Azerbaijan by approximately 1.1% or 100 thousand people per year projected in the official national statistics will increase the demand for energy and other natural resources. This represents one of the main challenges for the reduction of GHG emissions.

In addition, constraints for the implementation of the present INDC and specific risks for the country could be listed as follows:

- The remaining occupation of the 20 % of the territory of Azerbaijan and consequently problems of one million refugees and IDPs, massive plunder of natural resources and other wealth, as well as extermination of flora and fauna in the occupied territories;
- Declining prices of oil in the global markets.

The Intended Nationally Determined Contribution of Azerbaijan

Base year	1990
Emissions per base year	Total emission 73.331 Gg CO ₂ equivalent (<i>excluding LULUCF</i>); Net emission 69.641 Gg CO ₂ equivalent (<i>including LULUCF</i>)
Time framework	2030
Covered sectors	Energy, agriculture, waste, LULUCF
Covered gases	CO ₂ , CH ₄ , N ₂ O, HFC, CF ₄
Considered emissions reduction	35% reduction at total emissions level compared to the base year. Total emissions reduction for 2030 compared to the base year: 25.666 Gg CO ₂ equivalent (<i>excluding LULUCF</i>) 24.374 Gg CO ₂ equivalent (<i>including LULUCF</i>)
Methodology used for GHG inventory	In the course of GHG inventory, the revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories were used.
Adaptation element	In order to reduce vulnerability of Azerbaijan towards climate change impacts, it is considered to develop relevant adaptation measures for decreasing or minimizing the losses that may occur at national, local and community levels per sector.

Mitigation

Energy sector

Development of legislative acts and regulatory documents on energy, the implementation of awareness activities on energy efficiency, the replacement of existing technologies in electricity and thermal energy production with modern technologies, the reconstruction of the distribution networks and transmission lines, the implementation of isolation works and application of modern lighting systems.

Oil and gas sector

- Application of new and modern environmental-friendly technologies in the oil and gas processing, production of fuel in line with EURO-5 standards in a new refinery complex by 2019 and strengthening the capacity of the staff;
- Modernization of gas pipelines, gas distribution system and other measures to decrease losses up to 1% by 2020 and ensure the volume of reduction in compliance with international standards by 2050;

- Based on adopted strategy, accumulation of gases emitted to the atmosphere during oil-gas production, prevention of gas leakages during oil-gas processing and at distribution networks.

Residential and Commercial Sectors

Massive use of control and measurement devices in electrical, heat energy and natural gas systems, application of energy-efficient bulbs, use of modern energy-saving technologies in heating systems, as well organization of public awareness programs on energy use.

The use of alternative and renewable energy sources

Development and application of technical and normative legal documents on the use of alternative and renewable energy sources based on conducted assessment, acceleration of works to supply of renewable energy for the heating system for the population, enhancement of use of innovative technologies, construction of small hydro power plants (HPPs) on small rivers, irrigation canals and water basins, as well as, use of biomass, solar power, electric and heat energy, wind power, heat pumps and geothermal energy in all sectors of economy.

Transport sector

Use of environmentally friendly forms of transport, enhancement of the use of electric vehicles at public transportation, electrification of railway lines and the transition to alternative current system in traction, improvement and expansion of the scope of intellectual transport management system, development of metro transport and increase of a number of metro stations, elimination of traffic jams due to the construction of road junctions and underground and surface pedestrian crossings.

Agricultural sector

Collect methane gas from manure of livestock and poultry, use of alternative sources of energy and modern technologies.

Waste sector

Develop modern solid waste management system at big cities of the country.

Land Use, Land-Use Change, and Forestry (LULUCF) sector

Plant new forest areas, water and land protecting forest strips (windbreaks), urban and roadside greenery as well as further improve the management of pastures and agricultural lands.



THE GOVERNMENT OF THE BAHAMAS

INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC) UNDER THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

Communicated to the UNFCCC on November 17, 2015

The Bahamas is pleased to communicate its Intended Nationally Determined contribution and the accompanying information to facilitate clarity, transparency and understanding under decisions 1/CP.19 and 1/CP.20.

Introduction

The vulnerability of The Bahamas to the impacts of climate change is well known given its geographical vulnerabilities (limited land masses, low-relief and dispersion of islands), environmental vulnerabilities (high temperatures, storm surges, sea level rise, flooding, tropical cyclones and non-tropical processes), the concentration of socio-economic activities and critical infrastructure in narrow coastal zones, its dependence on tourism and the limited human and institutional capacity. The Bahamas is also highly dependent on the imports of fossil fuels for energy needs which places a heavy burden on its economies as a result of the vagaries of global petroleum prices.

Based on the available scientific consensus we can expect more frequent and intense impacts over time.

It is within this context that The Bahamas is expected to adapt to the impacts of climate change while at the same time pursue a low carbon pathway in conformity to growing international and public pressure for environmentally friendly development that reduces their “carbon footprint” and exposure to climate change, while also increasing energy security.

In response to the challenges faced by climate change, The Bahamas has developed a National Climate Adaptation Policy (2006), a National Energy Policy (2013) and amended its Forestry Act (2014). The Bahamas has also worked

together with other CARICOM countries to form an implementation plan to deliver the strategic elements and goals of a Regional Framework for Achieving Development Resilient to Climate Change (2009-2015) which was developed to manage the effects of climate change on development.

Under preparation is a pilot project in Harbour Island to test and demonstrate ways of transitioning to a low carbon and climate resilient development pathway.

Despite these efforts, in order to respond to rising sea levels, the salinization of fresh ground water resources and the loss of potable water across The Bahamas a rapid transition to the use of reverse osmosis facilities to provide for this essential service has resulted in an increased dependence on processed water to meet the needs of a tourism and services dependent economy. The net effect is that in responding to climate change and increased use of fossil fuels has resulted as well as a dependence on imported technologies.

This document presents The Bahamas' Intended Nationally Determined Contribution (INDC) in accordance with Decisions 1/CP.19 and 1/CP.20, of the United Nations Framework Convention on Climate Change (UNFCCC) that invites Parties to communicate to the Secretariat their INDCs towards achieving the objective of the UNFCCC as set out in Article 2 of the Convention.

The Planning Process

The Bahamas INDC builds on the participatory multi-stakeholder and cross-sectoral consultative processes undertaken during the development of the Bahamas Initial and Second National Communications to the UNFCCC, its National Energy Policy as well as the formulation of a mitigation assessment using the Long Range Energy Alternatives Planning (LEAP) model for the Commonwealth of The Bahamas.

These processes created genuine national ownership of the INDC and highlighted synergies with other UNFCCC-related processes.

National Circumstances

The Bahamas consists of an archipelago of 700 islands and more than 200 cays, islets and rocks in the western Atlantic Ocean. The islands cover approximately 100,000 square miles (mi²) of ocean between latitudes 21° and 27° North and longitudes 72° and 79° West with a total land area of only 5,382

mi² (13,940 km²). Much of the land is a few metres above mean sea level and the highest point is only 206 ft (63 m) above mean sea level and the hydrological records indicate that sea level has risen over the past century by one foot (or 0.3 meters).

The economy is mainly based on Tourism which is the major contributor to GDP and foreign exchange earnings of The Bahamas with the financial services sector being the second largest contributor to GDP. The banking and finance sector accounts for approximately 15% of GDP. The Bahamas is one of the world's fastest growing of the larger ship registry centres, with nearly 1,600 vessels. There is a small but growing industrial sector, and Grand Bahama is home to several industries that include crude oil storage for trans-shipment. New Providence, the island on which the country's capital is located, is home to brewing, distilling and light manufacturing. There are a number of companies that produce paper products, furniture and bedding, and a small food processing industry. The agriculture and fisheries sectors combined account for 3 to 5% of GDP.

Statistics from the World Bank show that The Bahamas' contribution to the total global greenhouse gas emissions is almost negligible - 0.01%. Significant sources of GHG emission come from the energy and transport sectors.

Adaptation

Recognizing that mitigation alone will not protect us from the negative effects associated with a changing climate; The Bahamas understands the urgent need for adaptation.

Adaptation activities are important to The Bahamas for the survival of its people and alleviation of poverty. For example, sea level rise will result in loss of fresh water lens which will increase the inhabitant's dependence on Reverse Osmosis (RO) for the production of potable water. These plants are expensive and fossil fuel intensive, thus increasing GHG emissions. The cost of doing business is predicated on basic input, energy and water, which determines electric supply. As these costs continue to rise, primarily due to adaptation to climate change, the cost of doing business in The Bahamas becomes significantly higher. This creates a domino effect and has negative implications for the country's economic outlook and stability.

Cognizant of the potential further impacts of climate change, The Bahamas has expanded its adaptation focus. Near shore marine environments play an integral role in the protection of the critical infrastructure across the archipelago. In 2008, as a part of the Caribbean Challenge Initiative, we

committed to the protection of 20% of our near shore marine environment by 2020, and have this year achieved half of our goal. These protected areas will conserve and protect habitat for Grouper and Bonefish spawning aggregations, coral reefs, sea grass meadows, mangrove nurseries and important bird areas. There are many other sectors that require extensive measures of adaptation.

The following table outlines adaptation measures undertaken and options.

Sector	Adaptation Options
Agriculture, livestock development and Fisheries	Formulate and implement strategies and measures which will help to enhance food security and sustainable food production
Tourism	Work with stakeholders in the tourism sector to develop a strategic plan, which incorporates Climate Change considerations and appropriate measures such as water conservation programmes, as well as general sustainability concerns.
Health	<p>Options include:</p> <p>Tracking data on environmental conditions, disease risks, and conditions, related to climate change.</p> <p>Enhancing the science base to better understand the relationship between climate change and health outcomes.</p> <p>Identifying locations and population groups at greatest risk for specific groups at greatest risk for specific health threats, such as heat waves.</p> <p>Expanding capacity for modeling and forecasting health effects that may be climate - related.</p>
Financial and Insurance Sectors	An option available is to reduce property insurance cost for high-elevation lots and impose higher property insurance for properties at lower elevations.

Coastal and Marine Resources and Fisheries	Adopt short-, medium-, and long-term measures to protect coastlines and increase the resilience of coastal ecosystems, enforcement of setbacks, and restoration of coastal wetlands;
Energy	Promote the use of less carbon intensive fuels;
Forestry	An option is to further quantify costs for Forest Estate Management Plan, four (4) Pine Islands (Abaco, Grand Bahama, Andros, New Providence) alone amounts to between \$75M-100M for monitoring, imagery and sustainable forestry management practices.
Human Settlement	Relocation of communities from the shoreline. This has already proven effective. New coastal defenses have been built and existing ones strengthened. Building codes have been made more robust to mitigate against increase wind loadings; and adapted to a loss of freshwater by employing reverse osmosis facilities throughout our islands to provide access to potable water
Transportation	An option is to regulate motor vehicle emissions by setting and enforcing standards, and enforcing proper maintenance of private and public vehicles; other options include: Introducing a system that captures data critical to climate change. E.g. Number of motor vehicles; national mandatory communications and data submissions with/to Dept. of Statistics
Water Resources	Continue the trend of employing reverse osmosis facilities throughout our islands to provide access to potable water to adapt to loss of freshwater by saltwater intrusion. As an option address retrofitting water and sewage infrastructures

Mitigation

In light of the expected climate change impacts for The Bahamas and, taking into account its tourism based economy, taking action to implement climate change mitigation policies in the country is necessary to reduce climate change impacts and assume responsibility for the country's GHG emissions. The Government of The Bahamas has recognized the importance of addressing climate change both from a mitigation and adaptation perspective and is committed to playing its part as a responsible member of the global community, and as a signatory to the UNFCCC, making efforts to achieve the objective of the UNFCCC, regardless of our contribution on a global scale.

The electricity and transport sectors are the main usage sectors of fossil fuels in the country and the electricity demand is expected to increase in the medium term. Accordingly the Government has defined the policy framework for a low carbon development plan through the National Energy Policy, that sets a target to achieve a minimum of 30% renewables in the energy mix by 2030 and will allow for a 10% Residential Energy Self Generation Programme within the year. This comprehensive programme of efficiency improvement and energy diversification will allow The Bahamas to provide high-quality, affordable, environmentally-friendly energy and to reduce the amounts of imported oil that the country uses. Energy diversification will involve moving from a high dependence on petroleum to increase the contribution of other sources such as renewable energy from solar, ocean and wind. Indeed, The Bahamas is well positioned to tap local renewable energy resources such as wind and sun.

Through Public Private Partnerships and government funding, The Bahamas will focus on the development of indigenous renewable energy resources with the goal of increasing the percentage of renewables in the energy mix to a minimum of 30% by 2030. For The Bahamas, as for many non-oil producing nations, the development and diffusion of renewable energy resources and technologies will help realize important economic, environmental and social objectives. Renewable resources such as wind, solar, waste-to-energy and biomass are indigenous to the country, and if developed adequately, can provide cleaner, and in the long term, more affordable alternatives to fossil fuels. This will not only lower the country's oil bill but also will improve energy security through diversification of the energy base. Also, increased use of renewable energy will lessen environmental impacts and reduce the country's carbon footprint – and thus its contribution to greenhouse gas emissions.

The Bahamas National Energy Policy establishes linkages with other sectors, (transport, construction, finance, inter alia) of the economy in order to achieve policy coherence and fulfill the achievement of the country's energy goals.

The transport sector will play a strategic role in ensuring that it becomes more energy efficient. To this end, a range of strategic interventions will be undertaken. For example, the transport sector strategy will discourage the importation of inefficient motor vehicles by linking the tax regime to mileage per gallon and the engine capacity and also by lowering import duties on hybrid and electric cars. The transportation policy will encourage the development and implementation of energy related measures such as: efficient traffic management; carpooling; park and ride; use of clean fuels to minimize pollution; flexi-work hours and tele-commuting; an efficient public/urban mass transit transport system; encouraging non-motorized transport; and promoting vehicle and road maintenance programmes. Supporting legislation and infrastructure for use of biofuels will be put in place.

The construction industry will be held to the energy efficiency standards outlined in an energy-efficiency building code; this will require architects and engineers to design, build and renovate buildings to incorporate energy efficient lighting and cooling systems and utilize building materials and employ energy efficient construction methodologies. Consideration will also be given to providing incentives for constructing carbon neutral buildings that would use no energy from the national power grid but focus more on renewable and more sustainable energy sources. Energy conservation and efficiency and use of renewable energy also will be further promoted and facilitated for the hotel and tourism industry. This will lead to a more sustainable and green tourism industry, which is becoming increasingly important in the global tourism arena.

The Finance Ministry will develop and implement a programme of incentives and fiscal measures to enable and support investments in modern facilities and infrastructure in the energy sector; energy efficiency and conservation initiatives; and the further advancement of renewable energy options. The domestic financial sector will actively seek to participate in investing in energy sector development. It will be important for adequate information to be disseminated and incentives to be created to enable the participation of local financial institutions in the financing of energy projects, particularly those related to renewable energy. A system of shared decision making will be stated and agreed upon. This will ensure that economic decisions that consider energy-related issues are collaborative and would also ensure that those decisions are consistent with the Bahamas National Energy Policy.

In addition to The Bahamas National Energy Policy, the Forestry Act was amended to allow for the establishment of a permanent forest estate. Under the amended Act, 20% of the land cover is designated into one of three categories (forest reserves, protected forests and conservation forests) and will be subject to a management plan for suitable management and environmental

conservation. The establishment of the National Forest Estate will deliver global environmental benefits along with domestic livelihood support and human development. It will safeguard future land degradation on the Pine Forest Islands through the improvement of the provision of forest ecosystem goods and services. It will reduce GHG emissions from deforestation and forest degradation and increase carbon sequestration. Results of a mangrove ecosystem study on one Pine Island (Andros) indicate that approximately 5,661,077tCO₂eq may be removed from the atmosphere through the proper management of the ecosystem. Proper management will improve the functionality of our mangrove ecosystems and increase their carbon sink ability. It will also reduce the vulnerability of forest ecosystems to climate change and other human-induced impacts: due to improved harvesting practices reducing human impacts while increasing the productivity in forest dependent communities.

These Pine Islands and other designated National Forests across The Bahamas may be considered for inclusion in REDD+ activities, pending further study.

Information to facilitate clarity, transparency and understanding

Time frame for Implementation	The timeframe for implementing the INDC is from 2010-2030
Scope of gases included in the contribution	Carbon dioxide, Methane and Nitrous Oxide
Sectors covered by the contribution	Energy and Forestry

Assumptions and methodological approaches

Methodology for emissions counting	The IPCC Revised 1996 Guidelines for National Greenhouse Gas Inventories and the Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories were used to calculate the GHG emissions and removals as described in the Second National Communication. Emissions of carbon dioxide from the combustion of biomass are assessed but not counted towards the contribution.
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Global warming potentials	The carbon dioxide equivalent was calculated using the 100 year global warming potentials in accordance with the IPCC 2nd Assessment Report
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Fairness and ambition

Through various national policies and initiatives, it is estimated that The Bahamas will reduce its emissions by a minimum of 30% below 2002 levels.

Based on its national circumstances, The Bahamas believes its target to be fair and ambitious considering its genuine efforts to move forward in an effective manner to maintain sustainability while at the same time facilitating its transition to a low-carbon and climate-resilient economy. The Bahamas' contribution exceeds the requirements for Small Island Developing States as decided in Decision 1 CP/20 paragraph 11 which states that "small island developing states may communicate information on strategies, plans and actions for low greenhouse gas emission development reflecting their special circumstances in the context of intended nationally determined contributions"

It is important to The Bahamas that in order to meet the below 1.5- 2°C objective, each Party must undertake mitigation actions based on the common but differentiated responsibilities and respective capabilities in accordance with the Convention.

Means of Implementation

Until this point, The Bahamas collective efforts to respond to the climate challenge have been realized largely through the use of national resources. In a similar manner efforts to achieve the Millennium Development Goals have come with limited or no support from the international community. The Bahamas intends to achieve these mitigation actions through an economy-wide in GHG emission of 30% when compared to its Business as Usual (BAU) scenario by 2030.

The Bahamas will require international support in the form of finance, investment, technology development and transfer and capacity-building in its efforts to capitalize on greater utilization of renewable sources of energy and adapt to the negative impacts of climate change that affect various sectors of

the economy. The implementation of the INDC is estimated to cost in excess of 900 million dollars to implement mitigation actions alone, through 2030. The cost for implementation is anticipated to be met through multilateral and bilateral support from a variety of sources, instruments and on varying access terms. The Bahamas has limited experience using market mechanisms under the Kyoto Protocol; however, it is open to the consideration of market mechanisms.

The Bahamas will undertake a cost analysis to determine the cost to implement adaptation actions.

Additional information

The Commonwealth of The Bahamas has since becoming a sovereign independent small island developing state made tremendous strides in providing for its citizenry universal access to education, potable water, telecommunications, electricity, transport services and health care across the entire Commonwealth of islands.

The passage of hurricane Joaquin which devastated the south central Bahamas in October dramatizes the vulnerability of our people. Post Joaquin, the islands in the South Central Bahamas have experienced extensive damages to built environment, infrastructure, homes and schools and significant economic losses in the tens of millions of dollars. The storm has directly affected some 5 – 10 000 people. Initial estimates to replace damaged infrastructure are in excess of 60 million dollars.

The adverse impacts of climate change were demonstrated and exacerbated by our geographical (limited land masses, low-relief and dispersion of islands) and environmental (high temperatures, storm surges, sea level rise, flooding, tropical cyclones and non-tropical processes) vulnerabilities. Concentration of socio-economic activities, critical infrastructure in narrow coastal zones, dependence on tourism and limited human and institutional capacity are all factors that make The Bahamas vulnerable to climate change.



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

SUBMISSION BY BAHRAIN

As a member of the Small Island Developing States (SIDS) the Kingdom of Bahrain hereby communicates with good faith its intended nationally determined contribution, recalling paragraph 11 of Decision 1/CP.20 which provides that “*small island developing States may communicate information on strategies, plans and actions for low greenhouse gas emission development reflecting its special circumstances in the context of intended nationally determined contributions.*”

Special National Circumstances

The Kingdom of Bahrain is an archipelago of low-laying islands, islets, shoals and patches of reefs situated off the central southern coast of the Arabian Gulf. Bahrain has limitations in its size, population and economy which give rise to constraints in financing, technical capacities and options for emission-reduction technology. Bahrain makes relatively minor contributions to global greenhouse gas emissions and mitigation potential will largely depend on national circumstances, capacity and support. Being particularly vulnerable to the impacts of climate change, adaptation is a key priority. Bahrain has no natural surface freshwater resources, scarce and irregular rainfall, minor and dwindling hydrocarbon resources, limited scope in the near term in terms of developing significant alternatives to hydrocarbons-based energy, and an increasingly high population density. As such, a delicate balance must be struck in order for Bahrain to be able to develop sustainably. In addressing economic matters, and as a small island, minimizing the negative impacts of the implementation of response measures with respect to the energy, transport and tourism sectors are of strategic concern.

Intended Nationally Determined Contribution

Action with mitigation co-benefits

The Kingdom of Bahrain’s Economic Vision 2030¹ provides the long-term vision for a policy to diversify the economy. The aim is to *inter alia* reduce Bahrain’s dependence on oil & gas, focusing on the financial, manufacturing and tourism sectors. In line with Decision 24/CP.18, and putting forward current actions and plans in pursuit of economic diversification that have co-benefits in the form of emission reductions, Bahrain’s Vision 2030 maintains that “*protecting our natural*

¹ http://issuu.com/economicdevelopmentboard/docs/bahrain_vision_2030

environment will include conserving our natural spaces for future generations to enjoy; implementing energy-efficiency regulations; directing investments to technologies that reduce carbon emissions, minimize pollution and promote the sourcing of more sustainable energy.”

The following are strategies, plans and actions the Kingdom is undertaking which may contribute to low greenhouse gas emission development:

<p>Energy Efficiency</p>	<p>Kingdom of Bahrain Energy Efficiency Programme (KEEP) targets public, residential and commercial buildings and the industrial sector. It aims to improve energy efficiency to reduce cumulative electricity consumption by 2030.</p> <p>Bahrain Petroleum Company (BAPCO) Energy Conservation Policy promotes the efficient use of natural resources, focusing on four key improvement areas: the improvement of heater efficiency; maximize condensate recovery; reduce mass loss; reactivate on-line energy intensity index.</p> <p>Bahrain National Gas Company (Banagas) has completed a retrofit project of gas turbines which involves replacement of existing high NOx combustion liners resulting in an average reduction of 44% NOx emissions from the power generation station.</p> <p>Tatweer Petroleum efficiency projects include manifold flare projects, associated gas compression projects, oilfield electrification projects and rental compressor stations projects have contributed to the reduction of CO₂ emissions.</p> <p>The Motor Vehicles Standards and technical regulations are adopted to reduce the emissions from gasoline and diesel engine vehicles.</p> <p>The Energy Efficient Lighting Initiative project supports replacing energy inefficient ILs with efficient CFLs in the short term and with more efficient technologies such as LED based lamps in the medium term.</p> <p>Civil Aviation Authority - Emission Management Plan for Sustainable Aviation Growth includes an aviation efficiency program. This is developed in response to the International Civil Aviation Organization (ICAO) 2010 Assembly Resolution A37-19.</p> <p>Bahrain Airport Company has recently achieved the Airport Carbon Accreditation ‘Level 1 Mapping’ from the Airports Council International (ACI).</p> <p>Ministry of Transportation and Communications continues to find ways and means to mitigate emissions from land transportation.</p>
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	The Kingdom of Bahrain established a unit for Sustainable Energy under the Minster of Energy that focuses on energy conservation and renewable energy Policies.
Carbon Capture and Storage	BAPCO Carbon Recovery Plan utilizes Waste CO ₂ rich off gas stream which is to be used for industrial applications. Gulf Petrochemical Industries Company (GPIC) Carbon Recovery Project is able to capture CO ₂ in the flue gases of the GPIC Methanol Plant.
Renewable Energy	BAPCO 5MW PV grid-connected plant aims at demonstrating PV solar technology under local conditions to support up scaling of renewable energy. The project consists of the installation of 21,000 smart solar panels to generate a substantial number of Kwhs of electricity annually. The Electricity and Water Authority 5MW grid-connected pilot power plant from solar/wind sources is underway.

Adaptation

Climate change impacts have already been observed in Bahrain and are further elaborated in its Second National Communication Report². The Kingdom of Bahrain has undertaken climate change vulnerability and impact assessments that have addressed four key areas: coastal zones, water resources, human health, and biodiversity.

Bahrain has no choice but to implement urgent measures to build resilience, improve disaster risk preparedness and response, and adapt to the increasingly adverse impacts of climate change in future. Indeed, there are substantially higher costs associated with adaptation to future impacts of climate change in Bahrain, if actions are initially delayed or ignored. At present, the action being taken to address the issue of adaptation is executed with limited capacities and resources, with a need for a more comprehensive and articulated adaptation package with support from the international community.

The Kingdom of Bahrain is undertaking the following actions that contributes to its adaptation to climate change:

Sea-level Rise	Coastal Resilience to Sea-Level Rise has been included in the Ministry of Works Dredging and Land Reclamation Technical Manual published in 2008. Using inter alia information found in Bahrain's Initial National Communication
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² <http://unfccc.int/resource/docs/natc/bhrnc2.pdf>

	Report to the UNFCCC, the recommended reclamation levels considers the clearance for expected sea-level rise due global warming of 0.4 meters.
Water Scarcity	It is expected that climate change impacts in terms of temperature increase, rainfall variability, and sea level rise would further aggravate the water situation and it is imperative to formulate a climate-resilient and integrated water resources strategy in order to sustainably manage its water resources. The National Water Resources Council was established in 2009 to address these challenges and its work is ongoing.
Food Security	The Artificial Reef Project aims to assist in the recovery of local fish stocks by landing artificial reefs in key zones. To build capacities and raise awareness, programs related to conservation, eco-system services and the sustainable use of biodiversity have been integrated into the national education curricula.

Adaptation action with mitigation co-benefits

Bahrain considers that adaptation action will have mitigation co-benefits that will increase climate change resilience, enhance carbon sinks, assist with protection of water resources and, more generally, the health of the people of Bahrain.

The Kingdom of Bahrain is planning to undertake the following actions to adapt to future environmental and social issues, which can also contribute to reduction in emissions:

Water Conservation	Ministry of Electricity and Water - Water Conservation Initiative project involves the upgrading of the water distribution networks in order to minimize water leakages. The increased efficiency results in a reduction of water consumption and thus power generation required for desalinization, which in turn leads to a reduction of emissions.
Sustainable Urban Planning	Ministry of Works, Municipalities Affairs and Urban Planning Sustainable and Green Building Construction projects will apply to the construction of new government buildings which will save energy and water. Given the projected future increase in vehicles and traffic, the Ministry of Works, Municipalities and Urban Planning have succeeded in and will continue to reduce traffic time for each vehicle by improving the transportation network. In collaboration with the Ministry of Transportation and Communications , bus routes were created across the country to increase public transport efficiency and attractiveness. Future projects include the GCC Railway Project, and the

	Bahrain Light Rail Project which may contribute to the reduction of personal vehicle use and emissions.
Blue Carbon	<p>A Mangrove Transplantation Project for the cultivation of plants and planting mangrove seedlings in order to rehabilitate degraded coastal areas began in 2013. The project succeeded in the cultivation of mangroves in Tubli Bay and Doha Arad. There is increasingly strong recognition that there is a need to properly manage particular habitats that act as critical natural carbon sinks. The Black Mangrove is found naturally in Bahrain and is able to sequester carbon and provide an efficient buffer for coastal protection. At present, the Kingdom of Bahrain does not have a full understanding of its mangroves as a carbon sink and is planning to engage with the International Union for Conservation of Nature to do so.</p> <p>Seagrass beds, which constitute an important carbon sink, are distributed along the southeast coast, and along the west coast of Bahrain. At present the Kingdom of Bahrain does not have a full understanding of its seagrass areas as a carbon sink and is planning to further engage with the International Union for Conservation of Nature to do so.</p>

Means of implementation for support contributions

The elaboration of this INDC includes a public participatory process through a series of multi-sectorial meetings, and has been reviewed by the National Climate Change Committee. This intended contribution is communicated under the assumption of the adoption of a universal, legally binding instrument that fully respects the principles and provisions of the UNFCCC, in particular the principle of common but differentiated responsibilities and respective capabilities. The domestic actions communicated in this INDC are voluntary and will be implemented in accordance with the principles and provisions of the Convention, in particular Article 4 paragraph 1, 7 and 8.

The Kingdom of Bahrain recognizes that the extent to which it will meet its obligations under the UNFCCC will depend highly on the level of international support in means of implementation. Therefore, mitigation and adaptation stipulations are meant to inform and will be undertaken in the context of support on finance, technology-transfer and capacity building.



Intended Nationally Determined Contributions (INDC)

September, 2015

**Ministry of Environment and Forests (MOEF)
Government of the People's Republic of Bangladesh**

Bangladesh's Intended Nationally Determined Contributions

1. National context

Bangladesh is a highly climate vulnerable country whose emissions are less than 0.35% of global emissions¹. Without ambitious action to limit greenhouse gases internationally, the future costs of adapting to climate change will be much higher than they are today. If the world fails to take ambitious action, the costs to Bangladesh of climate change could amount to an annual loss of 2% of GDP by 2050 and 9.4% of GDP by 2100². Bangladesh therefore wants to play its part in the global collective action to reduce future emissions as part of a robust and ambitious international agreement.

Consequently, Bangladesh is adopting a two-fold strategy against climate change. The main focus of Bangladesh's activities is on increasing our resilience to the impacts of climate change – which are already affecting the livelihoods of much of our population and will continue to do so in the future. For example, extreme temperatures, erratic rainfall, floods, drought, tropical cyclones, rising sea levels, tidal surges, salinity intrusion and ocean acidification are causing serious negative impacts on the lives and livelihoods of millions of people in Bangladesh, and are gradually offsetting the remarkable socio-economic development gained over the past 30 years, as well as jeopardising future economic growth. However at the same time, Bangladesh is also working to achieve lower-carbon as well as more resilient development. With this in mind, this INDC aims to put forth mitigation actions that Bangladesh can take to tackle its growing emissions and to play its role in global efforts to limit temperature rise to two degrees or preferably 1.5 degrees above pre-industrial levels.

With respect to Bangladesh's contribution to global efforts to counter climate change, this INDC sets out a number of mitigation actions that will help limit the country's GHG emissions. These mitigation actions will play a key role in realising the move to a low-carbon, climate-resilient economy and to becoming a middle-income country by 2021 whilst ensuring that it will not cross the average per capita emissions of the developing world. The INDC includes both unconditional and conditional emissions reduction goals for the power, transport, and industry sectors, alongside further mitigation actions in other sectors, which Bangladesh intends to carry out. Bangladesh intends to implement its conditional emissions reduction goal subject to appropriate international support in the form of finance, investment, technology development and transfer, and capacity building. The foundation of this INDC is Bangladesh's existing strategies and plans, in particular the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), Renewable Energy Policy 2008, the Energy Efficiency and Conservation Master Plan (E&CC Master Plan), the forthcoming National Adaptation Plan, the National Sustainable Development Strategy, the Perspective Plan (Vision 2021) and the Sixth (and forthcoming seventh) Five Year Plan, the National Disaster Management Plan and the Disaster Management Act. In addition, it incorporates the outcome of further analysis and consultation to enhance our existing plans, and to analyse future GHG emissions trends and mitigation and adaptation options.

The INDC of Bangladesh consists of the following elements:

- Mitigation contribution:
 - An unconditional contribution to reduce GHG emissions by 5% from Business as Usual (BAU) levels by 2030 in the power, transport and industry sectors, based on existing resources.

¹Climate Analysis Indicators Tool (CAIT) Version 2.0. (Washington, DC: World Resources Institute, 2014)¹. World Resources Institute

²<http://www.adb.org/news/bangladesh-could-see-climate-change-losses-reach-over-9-gdp-report>

- A conditional 15% reduction in GHG emissions from BAU levels by 2030 in the power, transport, and industry sectors, subject to appropriate international support in the form of finance, investment, technology development and transfer, and capacity building.
- A number of further mitigation actions in other sectors which it intends to achieve subject to the provision of additional international resources.
- Adaptation component:
 - An outline of what Bangladesh has already done on adaptation and what the next steps are, including the long-term vision for adaptation in Bangladesh and synergies with mitigation measures.
- INDC implementation:
 - Proposals for governance and coordination of INDC implementation and an outline of key next steps.
- Support for INDC implementation:
 - A qualitative description of Bangladesh’s support needs and an outline of plans to further quantify this, along with some examples of indicative costs of taking action on mitigation and adaptation.

Bangladesh reserves the right to revise its intended national target and contribution at any point of time and considers its INDC to be a living document that should be integrated with changed/modified national development goals and targets.

2. Mitigation

2.1. “Business as usual” emissions

As part of the process of preparing this INDC, Bangladesh has updated its projections of future greenhouse gas emissions including the development of a “Business As Usual” (BAU) scenario and analysis of mitigation potential in three key sectors. Emissions in the “Land use, land-use change and forestry” (LULUCF) sector were not modelled due to difficulties in obtaining the necessary data. Further details of the analysis will be published on the Ministry of Environment and Forests’ website.

2.2. Mitigation contribution

Bangladesh’s mitigation contribution covers the power, transport and industry sectors. Under a BAU scenario, GHG emissions in Bangladesh in these sectors are expected to represent 69% of total emissions by 2030 (excluding LULUCF), an increase of 264% by 2030, from 64 MtCO₂e in 2011 to 234 MtCO₂e in 2030.

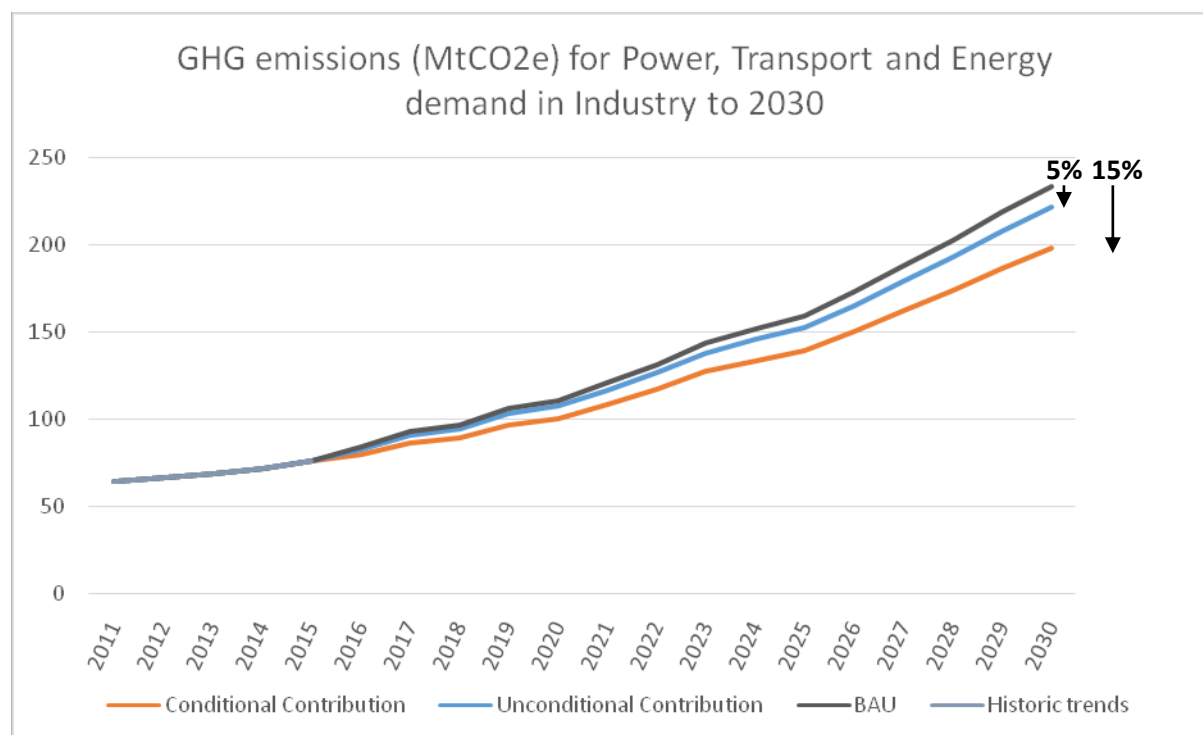
The contribution Bangladesh is willing to make is set out below.

Table 1: Intended Nationally Determined Contributions – Mitigation

Unconditional contribution	Contribution assuming no additional international support	Bangladesh will reduce its GHG emissions in the power, transport, and industry sectors by 12 MtCO ₂ e by 2030 or 5% below BAU emissions for those sectors.
Conditional contribution	Contribution assuming additional international support	Bangladesh will reduce its GHG emissions in the power, transport, and industry sectors by 36 MtCO ₂ e by 2030 or 15% below BAU emissions for those sectors.

These contributions are illustrated graphically below.

Figure 1: Projection of GHG emissions (MtCO₂e) on power, transport and industry sectors from 2011 to 2030



The reduction will occur as illustrated in following Table 2.

Table 2: Projected emissions reductions in the power, transport and industry (energy) by 2030

Sector	Base year (2011) (MtCO ₂ e)	BAU scenario (2030) (MtCO ₂ e)	BAU change from 2011 to 2030	Unconditional contribution scenario (2030) (MtCO ₂ e)	Change Vs BAU	Conditional contribution scenario (2030) (MtCO ₂ e)	Change Vs BAU
Power	21	91	336%	86	-5%	75	-18%
Transport	17	37	118%	33	-9%	28	-24%
Industry (energy)	26	106	300%	102	-4%	95	-10%
TOTAL	64	234	264%	222	-5%	198	-15%

This contribution is based on analysis carried out throughout 2015 using the best available data. However data quality and availability is an issue in Bangladesh. If new and more robust data comes to light in the future, or if assumptions change (e.g. projections of population or economic growth) the Government will update its analysis accordingly. This will be coordinated with the next update of the BCCSAP and also embedded within the National Communication and Biennial Update Report reporting cycle.

2.3. Mitigation actions

This section sets out some of the mitigation actions that the Government of Bangladesh is currently implementing and examples of the kinds of measures that could be implemented in the future to meet the contributions set out in section 2.2 above.

2.3.1. Mitigation objectives

Bangladesh's strategy on mitigation is set out in the BBCSAP. This sets out 7 programmes on mitigation:

Table 3: Mitigation programmes from the BBCSAP

Programme	Objective
Improved energy efficiency in production and consumption of energy	Ensure energy secure and low-carbon development of the economy
Gas exploration and reservoir management	Enhance energy security and ensure low-emission development
Development of coal mines and coal-fired power station(s)	Maximising coal output and managing coal fired power stations in a carbon-neutral way
Renewable energy development	Maximising the use of renewable energy sources to lower GHG emission and ensuring energy security
Lower emissions from agricultural land	Raise productivity of agricultural land and lower emissions of methane
Management of urban waste	Ensure liveable cities while lowering GHG (methane) emissions
Afforestation and reforestation programme	Provide support to scale up afforestation and reforestation

2.3.2. Existing mitigation actions

Bangladesh already has a number of activities and targets that are driving action to reduce GHG emissions, and that will help it meet the unconditional contribution set out in section 2.2, including:

- A target to reduce energy intensity (per GDP) by 20% by 2030 compared to 2013 levels (E&CC Master Plan)
- An Energy Management Programme, including establishment of Energy Management Systems and energy audits for industry by accredited energy auditors
- An Energy Efficiency labelling programme to promote sales of high efficiency products in the market
- Energy Efficiency measures for buildings, such as heat insulation and cooling measures, and a revised code on energy efficiency of new buildings
- The Solar Homes Programme, providing off-grid electricity access to rural areas
- A target to deliver 5% of energy from renewable sources by 2015, and 10% by 2020 (2008 Renewable Energy Policy)
- More than 1.5 million Improved Cook Stoves (ICS) and 4.0 million Solar Home Systems have already been distributed across the country
- Improving kiln efficiency in the brick making industry, composting of organic waste and waste biomass-based thermal energy generation
- Construction of Combined Cycle Power Plant (CCPP) by the Government of Bangladesh and utilities companies

- Under the Solar roof-top program around 14 MW of solar has been installed on the vacant roof-tops of Government and private buildings
- The country has set aggressive target to scale up the potentials of Solar Irrigation Pumps, Solar mini and nano grids to address the energy access issue of off-grid population

2.3.3. Additional mitigation actions in power, industry and transport

Bangladesh will also need to implement additional mitigation actions in order to meet the conditional contribution set out in section 2.2. Examples of these are set out in Table 4. More analysis will be taken in future to consider these options in more detail, based on the availability of funding support and internal capability, including as part of a proposed INDC implementation roadmap (see section 4), before decisions are taken.

Table 4: Possible mitigation actions to deliver the conditional contribution

Sector	Description	Objectives of the activity by 2030
Power	<ul style="list-style-type: none"> ▪ Ensure all new coal generation uses super-critical technology ▪ Increased penetration of wind power ▪ Implement grid-connected solar plant to diversify the existing electricity generation mix 	<ul style="list-style-type: none"> ▪ 100% of new coal based power plants use super-critical technology by 2030 ▪ 400 MW of wind generating capacity by 2030 ▪ 1000 MW of utility-scale solar power plant
Transport	<ul style="list-style-type: none"> ▪ Modal shift from road to rail, delivered through a range of measures, including underground metro systems and bus rapid transit systems in urban areas. Co-benefits will include reduced congestion, improved air quality and improved traffic safety. ▪ Reduced congestion and improved running of traffic. This will be achieved by a number of measures, including building of expressways to relieve congestion and public transport measures. 	<ul style="list-style-type: none"> ▪ To achieve a shift in passenger traffic from road to rail of up to around 20% by 2030 compared to the business as usual. ▪ 15% improvement in the efficiency of vehicles due to more efficient running.
Industry (energy-related)	<ul style="list-style-type: none"> ▪ Carry out energy audits to incentivise the uptake of energy efficiency and conservation measures in the main industrial sectors based on the Bangladesh Energy Efficiency and Conservation Masterplan 	<ul style="list-style-type: none"> ▪ 10% energy consumption reduction in the industry sector compared to the business as usual

2.3.4. Additional mitigation actions in other sectors

As explained above, sectors other than power, transport, and industry were not included in the quantified contributions as a robust data-set is not as readily available for these other sectors, making quantification of mitigation potential more challenging. Yet, Bangladesh will carry out more work in future, under the umbrella of the BCCSAP, to improve analysis in other sectors. And Bangladesh will also continue to consider mitigation actions in these sectors, despite their

contribution currently not being quantified in the INDC. Examples of potential measures in other sectors are set out below:

Table 5: Possible conditional action-based contributions

Sector	Description	Objectives of the activity by 2030
Households	<ul style="list-style-type: none"> • Put in place policy mechanisms to incentivise the uptake of improved (more efficient) gas cookstoves • Support the replacement of biomass with LPG for cooking purposes • Promoting policies to induce greater level of energy efficiency and conservation in the household sector based on the Bangladesh Energy Efficiency and Conservation Masterplan 	<ul style="list-style-type: none"> • 70% market share of improved biomass cookstoves, reaching 20 million households in 2030 • 40% market share of improved gas cookstoves • 10% market switch from biomass to LPG for cooking compared to the business as usual
Commercial buildings	<ul style="list-style-type: none"> • Promote policies to induce greater level of energy efficiency and conservation in the commercial sector based on the Bangladesh Energy Efficiency and Conservation Master plan • Incentivise rainwater harvesting in commercial buildings as a form of water and energy conservation 	<ul style="list-style-type: none"> • 25% reduction of overall energy consumption of the commercial sector compared to the business as usual
Agriculture (non-energy related)	<ul style="list-style-type: none"> • Increase mechanisation in agriculture leading to a reduction in numbers of draft cattle (and therefore lower methane emissions) • Increase the share of organic manure in the used fertilizer mix • Scale up rice cultivation using alternate wetting and drying irrigation 	<ul style="list-style-type: none"> • 50% reduction in draft animals compared to the business as usual • 35% increase in organic fertiliser share compared to the business as usual • 20% of all rice cultivation uses alternate wetting and drying irrigation
Waste	<ul style="list-style-type: none"> • Increase composting of organic waste • Promote landfill gas capture and power generation 	<ul style="list-style-type: none"> • 50% of the managed waste fraction is diverted from landfill to composting • 70% of landfill gas captured and used for electricity generation
Land use, land use change and forestry	<ul style="list-style-type: none"> • Continuation of coastal mangrove plantation • Reforestation and afforestation in the reserved forests • Plantation in the island areas of Bangladesh • Continuation of Social and Homestead forestry 	<ul style="list-style-type: none"> • Not quantified.

2.4. Information to facilitate clarity, transparency and understanding

This section provides more detail on the contributions set out in section 2.2 and the analysis that was carried out to inform them.

Table 6: Information to facilitate clarity, transparency and understanding

Time frames and/or periods for implementation	
Timeframe for implementation	The timeframe for implementation of the INDC is 2020 - 2030.
Scope and coverage	
Scope of gases included in the contribution	Carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and Sulphur Hexafluoride (SF ₆).
Sectors covered by the contribution	The contribution covers the power sector, and energy use in the transport and industry sectors. Other sectors are not included in the quantified contribution, but are included as action-based conditional contributions.
Geographies covered by the contribution	The contribution covers all of Bangladesh.
Assumptions and methodological approaches	
Methodology for estimating current and future emissions	The IPCC Revised 1996 Guidelines for National Greenhouse Gas Inventories and the Good Practise Guidance and Uncertainty Management in National Greenhouse Gas Inventories were used to calculate current and future GHG emissions. GHG projections were developed to be consistent with Bangladesh's aim of becoming a middle-income country by 2021. The exact approach to estimating GHG emissions was tailored for each sector according to the availability of data. For example, GHG emissions from road transport were calculated in a relatively disaggregated manner, by combining data on numbers of vehicles, distances travelled and the fuel efficiencies of the vehicles. Similarly, GHG emissions from electricity use in households were calculated in a detailed bottom-up manner, using data on projected numbers of electrical appliances and their efficiencies. On the other hand, GHG emissions from industry were calculated using aggregated energy demand data per industrial sub-sector and forecasts of future industrial output. Future emissions were modelled using the LEAP model, with emissions being calculated from the relevant activity data and emissions factors.
Global warming potentials	The carbon dioxide equivalent has been calculated using the 100 year global warming potentials in accordance with the Revised IPCC 1996 Guidelines.
Approach for land-based emissions	Data was not available to allow for detailed analysis of future GHG emissions and mitigation potential in the LULUCF sector. Further work will be needed to quantify this accurately (see section 4 on INDC implementation).
Synergies and co - benefits	The shortlist of mitigation options analysed for the INDC was created from a longer list by applying certain criteria, one of which was co-benefits. All the measures are expected to therefore have some co-benefits. These include improved air quality (e.g. from increased renewables or reduction in traffic

Time frames and/or periods for implementation	
	congestion), improved road safety (from modal shift to public transport and reduced traffic congestion), economic benefits from developing green jobs, cost savings to families (e.g. from lower running costs of cars and from energy efficient appliances) and improved access to energy (e.g. from localised biogas production). For more information on mitigation-adaptation synergies, see section 3.
Net contribution of International Market Based Mechanism	Bangladesh does not rule out the use of international market-based mechanisms in line with agreed modalities and accounting rules.

2.5. Fair and ambitious goal

Bangladesh is a Least Developed Country (LDC) whose emissions are less than 0.35% of global emissions. However, Bangladesh recognises that in order to meet the 2 degrees objective all countries will need to undertake mitigation in line with the IPCC conclusion that meeting 2 degrees requires global reductions to reduce by 40 to 70% global anthropogenic GHG emissions reductions by 2050 compared to 2010. Bangladesh's approach is driven by the long-term goal announced by its Prime Minister that its per capita GHG emissions will not exceed the average for developing countries. Therefore, Bangladesh's approach focuses on putting itself on a pathway which will avoid an increase of emissions per capita beyond this level, while pursuing national development goals.

Despite its current status as a LDC and its currently small share of past and current global GHGs, Bangladesh is still putting forward actions which will allow the country to embark on a low carbon development pathway, keeping in mind the global climate change agenda. This INDC represents the first time that Bangladesh has made an international undertaking to take action on mitigation and therefore fulfils the requirements of the Lima Call for Climate Action to go beyond existing efforts. The actions needed to deliver on these commitments will require international support in the form of **finance**, **technology transfer** and **capacity building**. Bangladesh will also provide a relevant contribution with regards to national financial resources, staff time and strong integration of development and mitigation activities.

In selecting the actions set out above, Bangladesh has prioritised those which fit with the growth priorities set out in our national development plans. In addition, Bangladesh has captured the synergies between mitigation and adaptation, not only by prioritising those adaptation activities with significant mitigation co-benefits, but also by seeking to minimise the carbon footprint of adaptation portfolio as a whole. The INDC contains a mix of measures that have already been taken forward under its own resources, thus demonstrating that Bangladesh is not content to wait for international support to take action on climate change.

3. Adaptation

3.1 Country situation on vulnerability

Bangladesh, one of the world's most disaster-prone climate vulnerable countries, has faced dozens of major disasters over its short history as a nation. Located on the Bay of Bengal, Bangladesh is particularly susceptible to seasonal cyclones, acting as a funnel for heavy precipitation from the Indian Ocean and creating extreme weather events. The country sits on the flood plain of several major rivers, which drain from the mountainous regions of the Himalayas, making seasonal flooding

another hazard often coinciding with the cyclone season. Current research and studies suggest that flood, tropical cyclones, storm surge and drought are likely to be more frequent and severe in the years to come. The Climate Change Vulnerability Index (CCVI-2011) calculated the vulnerability of 170 countries to the impacts of climate change over the next 30 years³, which reveals that Bangladesh is the most vulnerable country to climate change.

Climate change adaptation is a key priority and the country has already undertaken initiatives to mainstream adaptation into national development such as in the water, health, forestry, agriculture and more prominently in the infrastructure sectors. Bangladesh is already experiencing a host of climate impacts, including floods, storm surges, drought and river bank erosion. For example, floods in 2007 inundated 32,000 sq. km, leading to over 85,000 houses being destroyed and almost 1 million damaged, with approximately 1.2 million acres of crops destroyed or partially damaged, 649 deaths and estimated damage over \$1 billion. Climate change will drastically hamper economic growth of the country. For instance, the Asian Development Bank estimated that Bangladesh may experience a 2% GDP annual loss by 2050 because of climate change.

3.2 Adaptation goal

The primary goal for adaptation is to protect the population, enhance their adaptive capacity and livelihood options, and to protect the overall development of the country in its stride for economic progress and wellbeing of the people.

3.3 Adaptation action – past and present

Over the last three decades, the Government of Bangladesh has invested over \$10 billion (at constant 2007 prices) to make the country more climate resilient and less vulnerable to natural disasters. Flood management embankments, coastal polders and cyclone shelters have been built, and important lessons learnt on how to implement such projects successfully in the dynamic hydrological conditions of Bangladesh and with active participation of communities.

To enhance climate change adaptation activities in all key policies and sectors, Bangladesh has recently established two innovative funds: the Bangladesh Climate Change Trust Fund (BCCTF) from the Government’s own budget and the Bangladesh Climate Change Resilient Fund (BCCRF) with the support of development partners. Bangladesh submitted the National Adaptation Programme of Action (NAPA) in 2005 (revised in 2009) and prepared a climate change action plan (the Bangladesh Climate Change Strategy and Action Plan in 2009).

3.4 Expectations for future – near term plans and action

Considering the vulnerabilities, the government has identified the following areas of interventions to address adverse impacts of climate change:

Key Areas to address adverse impacts of climate change	
1.	Food security, livelihood and health protection (incl. water security)
2.	Comprehensive disaster management
3.	Coastal Zone Management including Salinity Intrusion control
4.	Flood Control and Erosion protection
5.	Building Climate Resilient Infrastructure
6.	Increased Rural Electrification
7.	Enhanced Urban Resilience
8.	Ecosystem based adaptation (including forestry co-management)
9.	Community based conservation of wetlands and coastal areas
10.	Policy and Institutional Capacity Building

³<http://maplecroft.com/about/news/ccvi.html>

Based on the above-mentioned areas the following broad adaptation actions are prioritized for the country:

Adaptation Priorities for Bangladesh	
i.	Improved Early warning system for tropical cyclone, flood, flash flood and drought
ii.	Disaster preparedness and construction of flood and cyclone shelters
iii.	Tropical cyclones and storm surge protection
iv.	Inland monsoon flood-proofing and protection
v.	Climate resilient infrastructure and communication
vi.	Climate resilient housing
vii.	Improvement of Urban resilience through improvement of drainage system to address urban flooding
viii.	River training and dredging (including excavation of water bodies, canals and drains)
ix.	Stress tolerant (salinity, drought and flood) variety improvement and cultivation (including livestock and fisheries)
x.	Research and knowledge management
xi.	Adaptation on local-level perspectives etc.
xii.	Adaptation to climate change impacts on health
xiii.	Biodiversity and ecosystem conservation
xiv.	Capacity Building at Individual and institutional level to plan and implement adaptation programmes and projects in the country

Bangladesh has already developed considerable infrastructure and capability to address these climate change-induced vulnerabilities through disaster risk management and climate change adaptation. In order to accelerate the present domestic initiatives to adapt to climate change and secure lives and livelihoods of people, the Government has allocated nearly \$ 400 million to Bangladesh Climate Change Trust Fund (BCCTF). As of June 2015 BCCTF has funded over 236 projects of which 41 have already been implemented. The projects undertaken so far from BCCTF include:

- Construction of embankments and river bank protective works
- Building cyclone resilient houses, excavation /re-excavation of canals
- Construction of water control infrastructures including regulators/slucice gates
- Waste management and drainage infrastructure
- Introduction and dissemination of stress tolerant crop varieties and seeds, afforestation
- Installation of solar panels.

Please see details on the country's achievement in the field of climate change adaptation in Annex 1

A significant number of development programmes are implemented under the revenue budget, and the allocation for BCCTF also comes from the revenue budget (FY-2013/14), so the total allocation to development activities amounts to about 32 percent of the national budget. An updated BCCTF project list is provided on the Fund's website⁴.

A good number of climate change adaptation projects have been further developed for implementation by different ministries and departments like Local Government Engineering Department (LGED), Water Development Board, Bangladesh Inland Water Transport Authority (BIWTA), Ministry of Disaster Management, Road and Transport Highways Division, Ministry of Road Transport and Bridges. Please see the detailed project list in Annex 1.

⁴<http://www.bcctf.gov.bd/images/180814/Updated%20Project%20List%2017.11.pdf>

Furthermore, Bangladesh has prepared a roadmap towards formulating a comprehensive National Adaptation plan (NAP) with a view to reducing vulnerability to the impacts of climate change by building adaptive capacity and resilience. The NAP is expected to facilitate the integration of climate change adaptation into relevant new and existing policies, programmes and activities in a coherent manner, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

Bangladesh is considered one of the leading countries in managing disasters, and many good lessons and practices gathered over the years are being replicated in the context of CCA.

3.5 Barriers and needs

Bangladesh acknowledges that climate change action requires a holistic approach and further acknowledges that many activities will deliver both adaptation and mitigation benefits. For example, Bangladesh's national afforestation programme has led to significant afforestation in newly accreted lands along the coast in the Bay of Bengal as well as reforestation in the adjacent denuded hills. About 195,000 hectares of mangrove plantations have been raised so far and these new plantations are also playing an important role in carbon sequestration. More analysis needs to be carried out on future GHG emissions and mitigation options for the LULUCF sector and when this is done, further consideration will be given to mitigation-adaptation synergies in this sector.

Needless to mention, domestic/national initiatives to address climate change vulnerabilities from our own resources are far from inadequate compared to what is required to address vulnerabilities of 160 million of the national population. Resources are required from international mechanisms to ensure climate resilient development of the country. This will assist in developing a comprehensive programme for adaptation and the NAP will form the core element of this programme.

Bangladesh acknowledges that monitoring and evaluation of adaptation policies and programmes is crucial to ensure that resources are well utilized to increase the overall resilience of our people. The objective is to mainstream adaptation initiatives in a National Monitoring, Reporting and Verification (MRV) system that is being planned.

4. INDC development and implementation

This INDC has been prepared through consultation and dialogue with the Government's Advisory and Technical Committees, which include a range of stakeholders including line ministries, Planning Commission, technical departments, professionals, experts, and the private sector.

With obvious reason the INDC implementation will be carried forward under the framework of updated and meaningful implementation of the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) and other key policies/plans. The BCCSAP is a ten-year programme running from 2009 to 2018, to build the capacity and resilience of the country to meet the challenge of climate change. An INDC implementation roadmap will be produced in 2016. This will review the current situation with respect to implementation of the BCCSAP, identify gaps and support needs, review barriers to implementation and present proposals for INDC implementation next steps.

Specific activities to be carried out in the development of the INDC implementation roadmap include:

- List potential mitigation interventions that could be studied in more detail and developed into NAMAs, along with recommendations on possible delivery levers (e.g. incentives, standards, fiscal levers etc).

- Carry out a review of Bangladesh’s current climate finance landscape, support needs and the international funding landscape, along with an assessment of climate finance readiness and gaps. Produce recommendations on an appropriate climate finance strategy for Bangladesh.
- Carry out a gap analysis of existing data sharing and reporting structures and processes and make initial recommendations on the appropriate form and structure of a national MRV system.
- Integration of the Climate Fiscal Framework (CFF) in the national planning and budgeting process to determine and disburse suitable yearly allocation for the implementation of mitigations and adaptation projects/programmes in this stipulated time-frame.
- Carry out a gap analysis of existing institutional framework and recommend institutional strengthening for effective access of international climate finances including Green Climate Fund
- Make recommendations on appropriate institutional structures for INDC implementation and coordination.
- Set out a clear roadmap and timetable for actions across the key elements of INDC implementation, grouping into short, medium and long-term actions.

INDC implementation will be taken forward by existing governance arrangements under the BCCSAP, with coordination being managed by the climate change secretariat in the Ministry of Environment and Forests, reporting to the Advisory Committee and the National Environment Committee (chaired by the Prime Minister). Specific implementation activities will be carried out by the appropriate line ministries and agencies with fiscal support under the fiscal framework of the Government. A comprehensive and robust INDC implementation framework will be developed in line with the existing CFF and other climate change related bodies.

5. Support for INDC implementation

Significant resources will be needed to support the implementation of Bangladesh’s INDC, including finance, technology transfer and capacity building support. This section gives examples of the kinds of costs facing Bangladesh, both for adaptation and mitigation, and a brief summary of the existing institutional frameworks on climate finance.

5.1. Adaptation costs

Being amongst the countries worst affected by climate change, much of the required resource will be focused on adaptation and improving climate resilience. The BCCSAP sets out the type of investments needed to address climate impacts, early warning systems, improved irrigation and water management, improved operation and maintenance and upgrading of coastal embankments and polders and upgrading of flood protection embankments/drainage systems⁵.

It was estimated by the World Bank⁶ in 2010 that by 2050, adaptation costs of tropical cyclones and storm surges will be \$5516⁷ million and the annual recurrent cost will be \$112 million, whereas for inland monsoon flooding the cost will be \$2671 million and the annual recurrent cost will be \$54 million. Just taking these two sectors into consideration, the cost is estimated to be around \$6.59 billion by 2030.

Bangladesh has already implemented some key adaptation activities as urgent and immediate needs of the country. Implementation of identified adaptation measures are very critical to increase the resilience of the country to climate change. It was estimated that Bangladesh will need to invest \$40

⁵ See box 7 of the BCCSAP.

⁶ World Bank. 2010. Main report. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2010/01/16420806/bangladesh-economic-adaptation-climate-change-vol-1-2-main-report>

⁷ \$ signifies USD throughout the document

billion from 2015 to 2030 in order to implement identified adaptation measures (detail in section 3) to address adverse impacts of climate change. This figure includes the actions included in the NAPA, BCCSAP as well as new adaptation needs for the period 2015-2030 based on the current NAP Roadmap and the 7th Five Year Plan. Some examples of specific adaptation-related costs are set out below:

Table 7: Estimated costs of key adaptation measures

Adaptation measure	Estimated investment required (billion USD, 2015-2030)
Food security and livelihood and health protection (incl. water security)	8
Comprehensive disaster management	10
Salinity intrusion and coastal protection	3
River flood and erosion protection	6
Building climate resilient infrastructure	5
Rural electrification	3
Urban resilience	3
Ecosystem based adaptation (incl. forestry co-management)	2.5
Community based conservation of wetlands and coastal areas	1
Policy and institutional capacity building	0.5

5.2. Mitigation costs

Further work will be needed to assess the scale and scope of investment needs for mitigation activities (see section 4 on INDC implementation). But examples of the kinds of investment required (2011-2030) to implement key mitigation measures are set out below:

Table 8: Estimated costs of key mitigation measures

Mitigation measure	Estimated investment required (billion USD, 2011-2030)	
Switching to 100% super-critical coal power generation	16.50	
Developing utility-scale solar energy	1.30	
Scaling up wind energy	.60	
Repowering steam turbine with CCGT	.63	
Expanding the Solar Homes Programme	1.20	
Other solar	Solar Irrigations Pumps	.60
	Solar Mini-grids	.25
	Solar Nano-grids	.27
	Pico-solar	.10
Scaling up biomass production from sugar	.20	
Building an Elevated Express Highways in Dhaka for decongestion of the main urban traffic arteries	2.65	
Dhaka mass rapid transit system	2.70	

This is expected to ensure better synergy among financing intermediaries to leverage investments that are greater than the sum of their parts. Effective access to international climate finances is critical for implementation of the Bangladesh INDC to address adverse impacts of climate change for sustaining economic growth and thereby aiding to achieve middle-income country status by 2021.

Annex1 – Adaptation projects and achievements

List of adaptation projects

LGED:

Haor Infrastructure and livelihood Improvement Project (HILIP) including Climate Adaptation and Livelihood Protection (CALIP) – <http://www.lged.gov.bd/ProjectHome.aspx?projectID=274>

Emergency 2007 Cyclone Recovery and Restoration Project (ECRRP), LGED Part – <http://www.lged.gov.bd/ProjectHome.aspx?projectID=33>

Bangladesh Water Development Board (BWDB):

http://www.bwdb.gov.bd/index.php?option=com_content&view=article&id=133&Itemid=120

Bangladesh Inland Water Transport Authority (BIWTA):

http://www.biwta.gov.bd/website/?page_id=9

Road and Transport Highways Division, Ministry of Road Transport and Bridges:

The list of projects is divided into three sections.

- Foreign funded projects: http://www.rthd.gov.bd/foreign_project.php
- Mega Projects: <http://www.rthd.gov.bd/elibrary.php>
- Fast track projects: http://www.rthd.gov.bd/fast_track_project.php

Bangladesh Climate Change Trust:

<http://www.bcct.gov.bd/images/180814/Updated%20Project%20List%202017.11.pdf>



Barbados

Intended Nationally Determined Contribution

Communicated to the UNFCCC on September 28, 2015

The National Context

As a small island developing state (SIDS) that is extremely vulnerable to the adverse impacts of climate change and cognizant of the implications for its economic, social and environmental sectors, the Government of Barbados (GOB) ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994 and the Kyoto Protocol in 2000. Since then, Barbados has actively participated in the Conference of Parties (COP) and related inter-sessional meetings of the UNFCCC, as well as undertaken a variety of measures that fit with the overarching objective of the Convention and intended to build national resilience to the challenges imposed by climate change. Accordingly, with the recognition of the need for an urgent global response to address the adverse impacts of climate change, the GOB is expecting the agreed and adopted outcome of the 21st COP of the UNFCCC to be an internationally legally-binding agreement under the Convention that is in the form of a protocol and is applicable to all Parties.

Barbados possesses many of the inherent economic, social and environmental vulnerabilities that are associated with Small Island Developing States (SIDS). Among others, these include susceptibility to natural disasters and extreme events; a small population; limited land and natural resource base; and a small open economy. These will be exacerbated by the impacts of climate change and, if left unchecked, undermine the sustainable development gains that have been achieved over the course of the country's history.

Barbados is experiencing more extreme weather events, as well as more subtle changes to temperature and precipitation patterns. Observations confirm that temperatures are rising, the frequency of extreme weather events are increasing, sea levels are rising and coral bleaching events are more frequent. These observations are consistent with climate change projections for the Caribbean region¹.

The GOB has drafted a National Climate Change Policy Framework (NCCPF), which provides the country's overarching approach to adaptation and mitigation and is in line with the Barbados Sustainable Development Policy (2004). The NCCPF is monitored by the National Climate Change Committee (NCCC).

¹ Climate Change Risk Profile for Barbados (CARIBSAVE 2012)

The Barbados Sustainable Development Policy's overarching goal is stated as

“to ensure the optimisation of the quality of life for every person by ensuring that economic growth and development does not occur to the detriment of our ecological capital.”

Deriving from this, the primary goal of the NCCPF is to “establish a national process for adapting to climate change effects and minimising greenhouse gas emissions over the short, medium and long term, and to do this in a manner that is coordinated and consistent with the broader sustainable development aspiration.” Its associated objectives are to:

- establish an appropriate mechanism for responding to the challenges of climate change;
- engage in regional and international climate change negotiation, planning and response mechanisms;
- effect full stakeholder engagement in the development and execution of domestic climate change mitigation and adaptation actions; and
- conduct climate change research.

The NCCPF is monitored by a National Climate Change Committee that is comprised of representatives of government ministries, non-governmental organizations, and private sector agencies.

Despite its limited financial resources and negligible contribution to greenhouse gas (GHG) emissions on a global scale, Barbados is taking a proactive and ambitious approach to reducing its own emissions by introducing concrete mitigation actions that will see the decarbonisation of its electricity grid, initiatives to improve energy efficiency and reduced emissions from its other sectors. The country's Green Economy Scoping Study², national Sustainable Energy Framework (SEF)³ and proposed Nationally Appropriate Mitigation Action (NAMA)⁴ for the energy sector, form the backbone of this Intended Nationally Determined Contribution (INDC). Inevitably, as a SIDS, while Barbados can show leadership and intention, a portion of its ambitious contribution to reduce GHG emissions will be dependent on technology transfer and financial support from the international community in order to realise its objectives.

Adaptation

As a minimal contributor to global GHG emissions, Barbados places prominence on adapting to the effects of climate change. The changing conditions will see a noticeable impact on the limited availability of fresh water, agricultural productivity, increased land degradation and reduced fish stocks caused by the migration of fish to cooler waters beyond the Caribbean region. The combination of reducing precipitation and salt water intrusion from sea level rise will compound the issue of insufficient water availability (through salinization of ground

² <http://www.unep.org/greeneconomy/Partnerships/NewScopingStudyinBarbados/tabid/79634/Default.aspx>

³ <http://www.energy.gov.bb/web/national-sustainable-energy-policy>

⁴ NAMA for renewable energy and energy efficiency in Barbados. The NAMA is currently in draft form and is expected to be published shortly.

water aquifers), further affecting the productivity of both agriculture and fisheries. Barbados will face indirect climate-related impacts including drought, flooding, and storms (physical damage), increased pest outbreaks, the spread of invasive species, the increased probability for the occurrence of vector borne and heat related illnesses and the destruction of key ecosystems which all threaten national productivity and may undermine the potential for real growth. With the majority of Barbados' population and its economic activities located within its narrow coastal zone, this area is undeniably one of the island's most valuable economic and social assets. Sea level rise, storm surges and inundation, in addition to the increased frequency in tropical storms, will present direct challenges to the coastal zone, in particular to the tourism sector in terms of potential loss and damage to key infrastructure.

Barbados' national adaptation response is consistent with existing national level policy, in particular the Medium Term Growth & Development Strategy – 2013 - 2020⁵ and the Barbados Sustainable Development Policy. Adaptation planning is also aligned to the CARICOM Regional Framework for Achieving Development Resilient to Climate Change and its associated Implementation Plan 2011 – 2021.

Taking a mainstreaming approach to climate change, the GOB has started to incorporate climate change adaptation into the following national plans and strategies:

- Medium Term Growth and Development Strategy 2013 – 2020;
- Physical Development Plan;
- White Paper on the Development of Tourism in Barbados and National Adaptation Strategy to Address Climate Change in the Tourism Sector in Barbados;
- Coastal Zone Management Plan;
- Storm Water Management Plan;
- Other sectoral plans including for agriculture, fisheries, water and health.

The sectors identified as most vulnerable to climate change are agriculture, fisheries, tourism, water, human health, coastal resources and human settlements⁶. Climate change will also impact vulnerable groups disproportionately, including youth and gender perspectives, which are cross-cutting concerns in Barbados' national development planning⁷.

⁵ <http://www.economicaffairs.gov.bb/download.php?id=327>

⁶ Identified through vulnerability assessments Initiated for the First National Communication to the UNFCCC (2001); revised and updated for key sectors included in the Second National Communication (forthcoming in 2015); also an independent vulnerability and needs assessment on agriculture: *A Vulnerability and Capacity Assessment of the Food Zone Of Barbados* (2015), Caribbean Community Climate Change Centre & Ministry of Agriculture, Food, Fisheries and Water Resource Management, Government of Barbados.

⁷ Gender and youth play a central role in the draft National Climate Change Policy Framework.

Mitigation

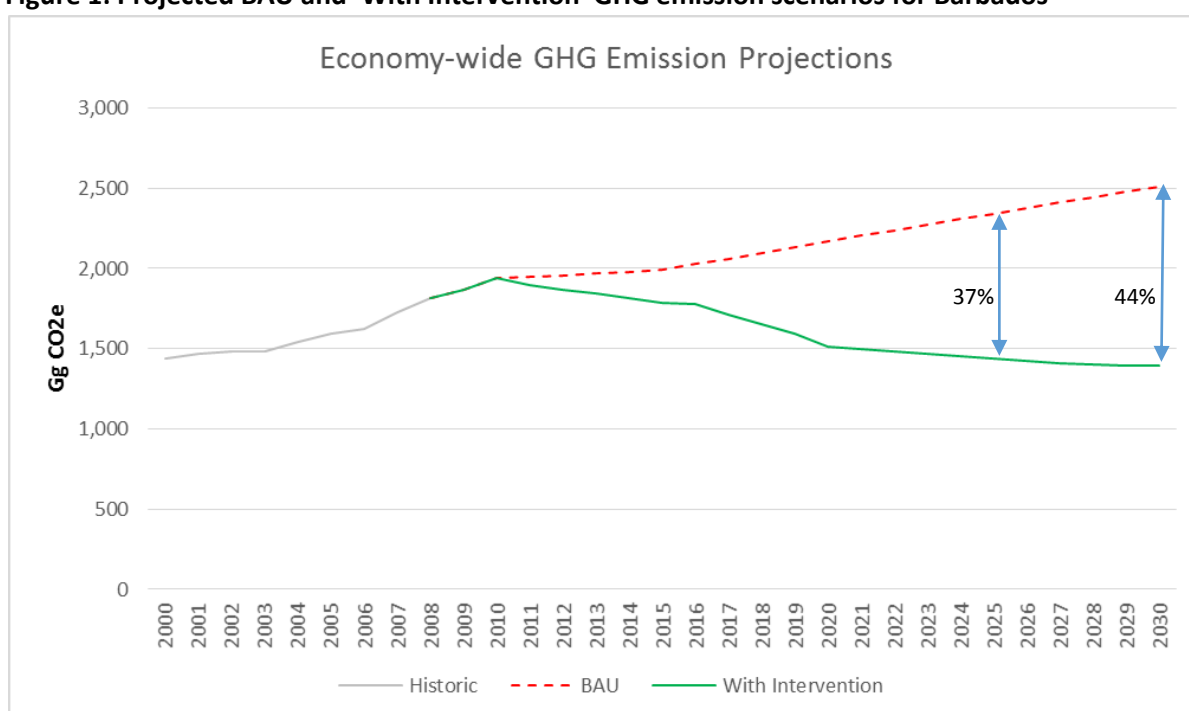
Economy-wide Contribution

Barbados intends to achieve an economy-wide reduction in GHG emissions of **44% compared to its business as usual (BAU) scenario by 2030**. In absolute terms, this translates to a reduction of **23% compared with the baseline year, 2008**.

As an interim target, the intention will be to achieve an economy-wide reduction of 37% compared to its business as usual (BAU) scenario by 2025, equivalent to an absolute reduction of 21% compared to 2008.

The above emission reduction contributions will be achieved through the mitigation actions in the energy and waste sectors, which accounted for the vast majority (88%)⁸ of GHG emissions in Barbados in 2008.

Figure 1: Projected BAU and 'With Intervention' GHG emission scenarios for Barbados



Energy Sector

Energy consumption accounted for 72% of Barbados' GHG emissions in 2008⁸ and is therefore the focus of its mitigation activity. Within the sector 67% arises from energy generation and 33% from transport. The following sub-sector contributions have been identified:

⁸ Barbados 2010 Greenhouse Gas Inventory. This forms part of the Second National Communication Report, which will be submitted to the UNFCCC shortly. 2008 has been chosen as the base year, so that measures in the waste sector that were implemented in 2009 can be excluded from the BAU projection.

- i. Renewable energy: contributing 65% of total peak electrical demand by 2030⁹. The country has made huge strides in this regard; for example distributed solar photovoltaic (PV) installation is growing exponentially and this trend is expected to continue. Other planned measures include waste-to-energy and biomass generation plants, wind, distributed and centralized solar PV and capture and use of landfill gas for energy generation.
- ii. Electrical energy efficiency: a 22% reduction in electricity consumption compared to a BAU¹⁰ scenario in 2029. Planned measures in this sector include the ‘Public Sector Energy Efficiency and Conservation Programme’, implementation of applicable recommendations through the Caribbean Hotel Energy Efficiency and Renewable Energy Action-Advanced Program (CHENACT), energy efficiency measures in homes and various LED lighting initiatives.
- iii. Non-electrical energy efficiency: a 29% reduction in non-electric energy consumption including transport, compared to a BAU scenario in 2029¹⁰. GOB is investing in alternative vehicles and fuels such as compressed natural gas, liquid petroleum gas, ethanol, natural gas, hybrid and electric and encouraging their adoption through tax incentives.

Waste Sector

Aside from the energy sector, emissions from waste represent the other main contributor to national GHG emissions (16% in 2008). Projects to divert waste from landfill and to develop waste-to-energy plants are underway to deliver savings in this sector.

Information to Facilitate Clarity, Transparency and Understanding

Parameter	Information
Timeframe and/or period for implementation	2030 (with an interim target in 2025)
Type of commitment	Absolute economy-wide emission reduction contribution (against BAU and base year)
Reference point or base year	2008 base year (1,820 Gg CO ₂ e)
Estimated quantified impact on GHG emissions	<ol style="list-style-type: none"> i. Intention to reduce GHG emissions by 44% below BAU levels by 2030 (23% below 2008 levels) ii. Intention to reduce GHG emissions by 37% below BAU levels by 2025¹¹ (21% below 2008 levels)
Business as usual methodology	The following assumptions have been made to generate

⁹ Honourable Darcy Boyce from the Ministry of Finance, Economic Affairs and Energy, speaking at an INDC workshop meeting in September 2015.

¹⁰ BAU projections take into account the expected growth in the future in each sector taking into account current mitigation activities. As identified in footnote (8), 2008 has been chosen as the base year.

¹¹ This reflects the preference of the CARICOM Heads of Government for “five (5) year mitigation commitment cycles, with robust ex ante and ex post review and upward adjustment processes” as defined in the 2015 Declaration on Climate Change developed at the 36th Regular Meeting of the Conference of the Heads of Government of the Caribbean Community (CARICOM), 2-4 July 2015, Bridgetown Barbados.

Parameter		Information
		<p>the BAU scenario:</p> <ul style="list-style-type: none"> • Electricity supply sector – this has been assumed to grow annually at 1%¹² • Municipal Solid Waste generation – this has been assumed to remain per capita as in 2014 (latest year available) • Transport and combustion in industry – this has been assumed to increase in line with GDP forecasts¹³ to 2020 and then continuing on the same trend to 2030 (no GDP projected data available to 2030). • All other sources (which are estimated together to contribute less than 10% of GHG emissions) have been assumed to remain at 2010 levels. • A fixed BAU scenario is being used for the INDC¹⁴.
Coverage	% national emissions	100% ¹⁵
	Sectors ¹⁶	<ul style="list-style-type: none"> • Energy (including domestic transport) • Industrial Process and Product Use • Waste • Agriculture • Land Use, Land Use Change and Forestry
	Gases ¹⁷	<ul style="list-style-type: none"> • Carbon dioxide (CO₂) • Methane (CH₄) • Nitrous oxide (N₂O) • HFCs • Sulphur Hexafluoride (SF₆)
	Geographical boundaries	Whole country

¹² Personal communication with Barbados Light & Power on the 17th September 2015.

¹³ Historical and projected GDP data provided by the Central bank of Barbados on the 17th September 2015.

¹⁴ BAU scenarios for an INDC can be “fixed” or “dynamic”. In this case, a fixed BAU will be used.

¹⁵ Excludes international shipping and aviation and is consistent with IPCC good practice.

¹⁶ Potential emissions reductions from Industrial Process and Product Use, Agriculture and Land Use, Land Use Change and Forestry were not considered, although these sectors are included in the baseline inventory and therefore the ‘economy wide’ savings.

¹⁷ Note: PFCs have not been estimated in the 2010 GHG inventory for Barbados. Barbados is committed to the provisions of the Montreal Protocol. HCFCs are scheduled for global phase out by 2030 and Barbados is already on a phase-out schedule with a 35% reduction forecasted by 2020. HFCs are on the rise nationally and globally but Barbados is committed to the transition to natural refrigerants with no-Ozone Depleting Potential (ODP), and little or no-ODP. This aspect has not been included in the GHG mitigation scenarios that have been undertaken for this INDC.

Parameter	Information
Intention to use market-based mechanisms to meet contribution	<ul style="list-style-type: none"> • Clean Development Mechanism (CDM) • Nationally Appropriate Mitigation Action (NAMA)
Metrics and methodology	Consistent with methodologies used in Barbados' forthcoming Second National Communication (2006 IPCC Guidelines).

Fairness and Ambition

Despite its negligible contribution to global GHG emissions (approximately 0.004%) and its SIDS status, Barbados is taking significant and ambitious steps to reduce its national emissions. All of the country's identified mitigation actions are being targeted by the INDC, which will result in per capita emissions of 4.8 tonnes CO₂e in 2030 (compared to 6.6 tonnes CO₂e in 2008), consistent with the projected global average emissions per capita in 2030 required to meet the 1.5°C above pre-industrial levels target¹⁸. This projection clearly demonstrates that despite Barbados' SIDS status, its ambition to reduce emissions is significant and reflects a fair contribution in the global context.

Planning Process

Adaptation

Barbados has set up the NCCC, coordinated by the Ministry of Environment and Drainage (MED), that reports on the development and implementation of all specific activities and programmes that are seeking to address climate change mitigation and adaptation. The NCCC represents the diversity of stakeholders engaged in Barbados' national climate change response, including relevant ministries, NGOs and private sector bodies. It is intended that the NCCC will also monitor the implementation and directives of the draft NCCPF, once formally approved. The NCCC currently meets to report progress on sectoral activities on a quarterly basis each year. Collectively, the representatives of the NCCC keeps the policy under regular review; monitors the implementation its directives; and presents annual reports to the Cabinet on measures that have been undertaken to implement this policy. The MED has coordinative oversight of the NCCC and the implementation of the NCCPF. Barbados has a number of ongoing programmes that are addressing adaptation as a central theme within these key sectors:

- Regional Monitoring and Evaluation System for Disaster Risk Management (DRM) and Climate Change Adaptation (CCA) in the Caribbean Tourism Sector;
- Water Resource Management & Flood Resilience CCA Programme;
- Coastal Risk Assessment Programme;
- Piloting CCA to Protect human Health Project (Global Project by WHO/UNDP & GEF funded);

¹⁸ The global target to avoid 1.5°C of warming is 4.8 tCO₂e per capita in 2030, assuming a global population of 8.2 billion (http://www.un.org/esa/population/publications/WUP2005/2005WUP_FS4.pdf) and global emissions of 39 GtCO₂e (http://climateanalytics.org/files/ca_briefing_benchmark_emissions_1p5_and_2oc_2020_2025_2030_201502_10_final_bh_may.pdf).

- Water Sanitation & Systems Upgrade;

Mitigation

Barbados has formalised its commitment to the mitigation activities summarised above through the planning and implementation of various mitigation actions and other initiatives to reduce GHG emissions and green its economy, which include inter alia:

- Formulation of NAMA at the national level, presenting a list of viable projects to reduce GHG emissions;
- The Barbados component of the CHENACT project, associated with promoting energy-efficiency and renewable energy in the tourism industry for the country, has provided a CDM Program of Activities and is included in the draft energy sector NAMA;
- National Sustainable Energy Policy and associated SEF providing top-down contributions for the energy and transport sectors;
- Green Economy Scoping Study and related activities;
- The CARICOM Declaration For Climate Action, calls for a legally binding commitment at COP21 for enhanced provisions for vulnerable countries and the adoption of the limiting of long-term the global average temperature increase to below 1.5°C above pre-industrial levels;
- The BRIDGE¹⁹ in Sustainable Energy and Information and Communication Technologies project is focused on developing human capital, while encouraging gender equality, to meet the expected future demand for technicians, professionals and entrepreneurs in the sustainable energy and information and communication technology sectors;
- The Resource Efficient Low Carbon and Circular Industrial Partnership Platform for Catalyzing Eco-Innovation and Entrepreneurship in Barbados (RECIPPEE-Barbados) is a new partnership between the GOB and the United Nations Industrial Development Organization (UNIDO) which will help Barbados advance a number of its development priorities, including building a resource efficient green economy through inclusive and sustainable industrial development;
- Major contributions by the private sector in installing solar PV and other renewable energy in response to global energy prices, declining renewable energy technology costs and government fiscal incentives.

To accompany all of these actions, GOB is also taking steps to put systems and processes in place to institutionalise a formal monitoring, reporting and verification (MRV) system to track national emissions and the impact of specific mitigation actions. As the national focal point the MED will coordinate other related ministries and stakeholders in the preparation of required reports for monitoring progress, implementation and reporting to the UNFCCC or otherwise as may be required.

¹⁹ 'Building capacity and Regional Integration for the Development of a Generation of Entrepreneurs'

Means of Implementation

Climate change is a cross-cutting issue that affects every part of the Barbadian economy, social structure and its' natural environment. In line with its national commitments it is crucial that Barbados continues to build on and strengthen its ambition to achieve the principles behind its sustainable develop policy, in addition to ensuring a low-carbon climate resilient society. In doing so, Barbados looks to regional and international cooperation for support in order to progress the mitigation and adaptation priorities set out in its INDC, that are in line with its national development objectives.

Barbados requires substantial assistance to meet its adaptation objectives set out in its INDC. As a highly vulnerable SIDS, Barbados is already experiencing frequent and major climate change impacts and extreme weather events that could decimate its economy in one extreme (climate related) event. Such impacts will be an ever present threat for the country and will continue to challenge the development of the Barbadian economy as a whole.

As a SIDS, Barbados will require significant financial, technology transfer and capacity-building support to deliver the intended contribution and related infrastructure. International grant and loan financing mechanisms such as the existing 'Energy Smart Fund'²⁰ will be imperative to provide financial and technical support to renewable energy and energy efficiency projects in Barbados. Initial analysis suggests that a number of the planned renewable energy projects (linked to mitigation in the waste sector) in particular, provide a strong economic argument to stimulate private sector investment; however enabling and technology transfer support will still be required. Mitigation actions in the energy efficiency and transport sectors will be largely dependent on international capital financing to implement and to achieve the relative contributions.

Specifically international support will be crucial to the implementation of actions set out in its NCCPF (once formally approved), in addition to its SEF, NAMA and other sectoral policies and plans. The flexibility offered by the existing (i.e. CDM) and future emission reduction mechanisms under the UNFCCC will be used where possible to achieve Barbados' contribution domestically or jointly with regional/international partners.

²⁰ Loan provided by the Inter-American Development Bank

Intended Nationally Determined Contributions of the Republic of Belarus

pursuant to paragraphs 13 and 14 of Decision 1/CP.20
adopted by the Conference of the Parties to UNFCCC

Executive Summary

The Republic of Belarus supports the collective efforts of the Parties to the United Nations Framework Convention on Climate Change (hereinafter referred to as UNFCCC) to achieve the major milestone of this century - keeping the average global temperature rise below two degrees Celsius as compared to the pre-industrial period. In order to contribute to the prevention of dangerous climate change, the Republic of Belarus submits its intended nationally determined contribution to these efforts and undertakes by 2030 to reduce greenhouse gas emissions by at least **28 per cent** of the 1990 level, excluding emissions and removals in the land use, land-use change and forestry sector and without any additional conditions (the commitments do not imply the use of the international carbon market mechanisms or mobilizing foreign financial resources for the implementation of best available technologies).

Figure 1 shows the dynamics of greenhouse gas emissions over the period of 1990-2012 and projections until 2030 based on the scenario, which takes account of the approved programmes for the development of sectors of the economy including the commissioning in 2018 of the Belarusian Nuclear Power Plant and additional policies and measures to reduce carbon intensity. According to the projections, after 2030 an upward trend in greenhouse gas emissions will continue to be observed with a peak in 2035.

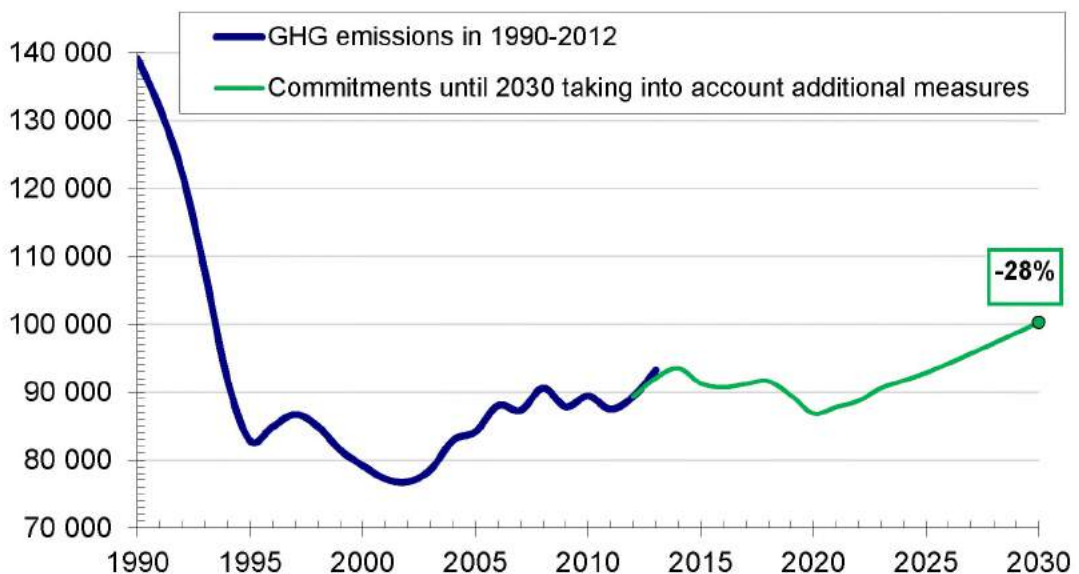


Figure 1 –Greenhouse gas emissions in 1990-2030,
Gg CO₂ eq.

Target Type

Absolute reduction of greenhouse gas emissions compared to the emissions in the base year.

Base Year

Year **1990** is chosen as the base year for determining quantifiable greenhouse gas emission reduction target. The same year was also adopted by the Republic of Belarus as the reference point when undertaking greenhouse gas emission commitments as part of previous international agreements on climate change.

Greenhouse Gas Emissions in the Base Year

To obtain data on greenhouse gas emissions in the base year, the National Greenhouse Gas Inventory of 2012 was used. The data of this inventory were also included in the Sixth National Communication sent to the UNFCCC Secretariat in February 2015, and underwent expert review by the UNFCCC Secretariat in April 2015.

According to these data, greenhouse gas emissions in 1990 were **139,151.23 thousand tons in CO₂ eq.**, excluding the land use, land-use change and forestry sector (hereinafter referred to as LULUCF).

Period Covered

Taking into account the National Sustainable Development Strategy until 2030, the year **2030** is taken as the target year for these commitments.

Therefore, the validity period of all commitments and targets of this document covers the period from **1 January 2021 to 31 December 2030**.

Scope of Commitments

In view of the methodology adopted in the country and reporting requirements regarding UNFCCC greenhouse gas inventories, the current commitments cover information on greenhouse gas emissions in the following sectors:

- power industry;
- industrial processes;
- use of solvents;
- agriculture;
- waste.

Approaches regarding the inclusion of the LULUCF sector into these commitments, which in the Republic of Belarus represents net removals of carbon from the atmosphere, will be determined after clarification of the methodological questions relating to the estimation of emissions and removals of greenhouse gases in this sector. No later than 2020, the Republic of Belarus will return to the question of including the potential of this sector in its commitments.

These commitments include the following greenhouse gases:

- carbon dioxide (CO₂);
- methane (CH₄);
- nitrous oxide (N₂O);
- hydrofluorocarbons (HFCs);
- perfluorocarbons (PFCs);
- sulphur hexafluoride (SF₆).

The Process of Planning and Fulfilment of Commitments

Long-term targets, on which the climate policy until 2020 is based, are specified in the Directive of the President of the Republic of Belarus No.3 of 14.06.2007 “Economy and thrift are the main factors of the economic security of the state”, the Concept of Energy Security of the Republic of Belarus (adopted by the Decree of the President of the Republic of Belarus No.433 of 17.09.2007), the Strategy for the Development of Energy Potential of the Republic of Belarus (adopted by the Resolution of the Council of Ministers of the Republic of Belarus No.1180 of 09.08.2010), national and sector-specific modernization and development programmes for the period until 2020, which list is presented in the Sixth National Communication (2015), including the National Programme of Measures to Mitigate Climate Change for 2013-2020 (adopted by the Resolution of the Council of Ministers of the Republic of Belarus No.510 of 21.06.2013). Thus, currently and until the end of 2020 there are various binding legislative provisions and other regulations in effect in the Republic of Belarus, specifying policies and measures with targets for the reduction of energy and carbon intensity of the national economy.

For the period of 2021-2030, the National Sustainable Development Strategy until 2030 approved by the Presidium of the Council of Ministers of the Republic of Belarus is a benchmark, which places due emphasis on the development principles founded on a low-carbon economy.

In 2016-2019, the legislative basis for the new national climate policy will be elaborated along with the programmes for the development of major economic activities for the period of 2021-2030, including measures regulating and stimulating the reduction of greenhouse gas emissions.

Main assumptions

a) National circumstances

Figure 2 gives data on the dynamics of greenhouse gas emissions for the years 1990-2012.

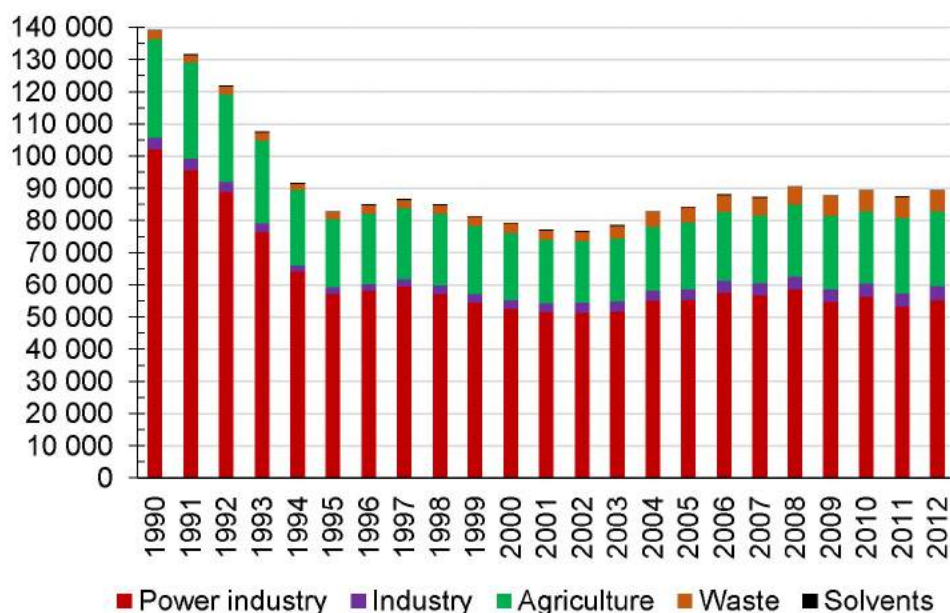


Figure 2 –Greenhouse gas emissions in 1990-2012
breakdown by sector, Gg CO₂ eq.

During the period under review, maximum greenhouse gas emissions were observed in 1990: 139,151.23 thousand tons of CO₂-eq. (excl. LULUCF). In 2012, the emissions amounted to 89,283.33 thousand tons in CO₂-eq. (excl. LULUCF) and decreased by 35.8 per cent as compared to 1990.

Such reduction in greenhouse gas emissions was, first, due to the dramatic emission reduction during the 1990-1995 period as a consequence of the economic recession in the country following the dissolution of the Soviet Union and the subsequent decrease in production and fuel consumption.

From 1995, a period of economic growth commenced, in the course of which the per capita gross domestic product (with account of purchasing power parity) demonstrated a 4.5-time increase by 2012. Greenhouse gas emissions also increased due to the growth of production, increased fuel consumption and increased volumes of landfilled waste. However, the emissions increase rate is significantly lower than the GDP growth rate (Figure3). The average annual GDP growth during the 1995-2012 period was 7.9 per cent, while the average annual increase of greenhouse gas emissions during the same period was 0.4 per cent. The carbon intensity of the economy during the period 1995-2012 decreased 3.9 times; this is the fastest rate of progress towards achieving low-carbon development parameters in Europe.

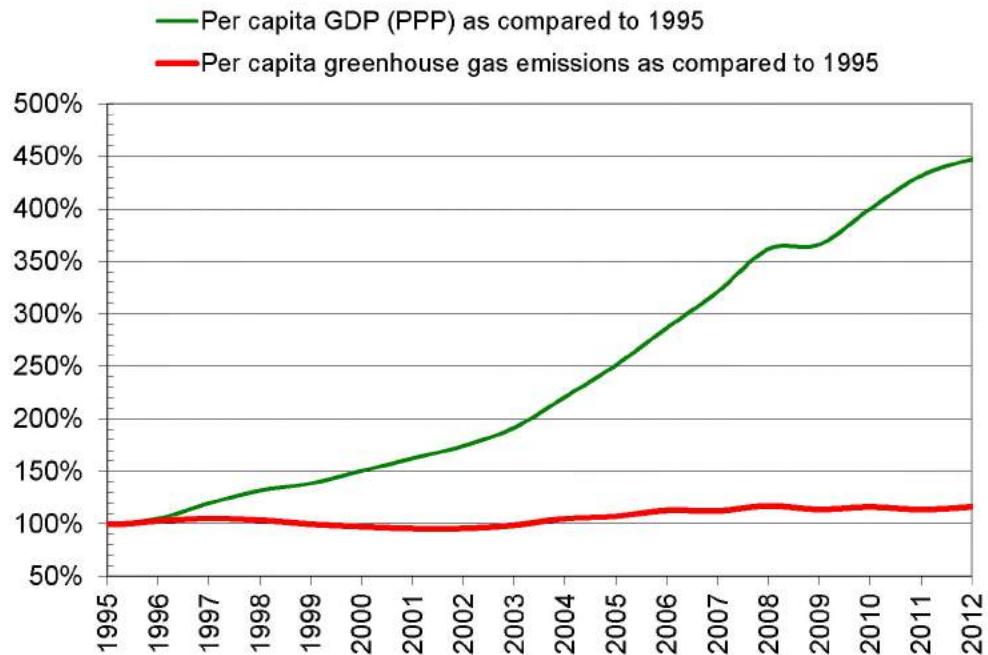


Figure 3 Dynamics of greenhouse gas emissions and gross domestic product in 1995-2012 (data for the 1995 is taken as 100 per cent)

The country managed to considerably reduce greenhouse gas emissions in the past by effectively implementing measures with relatively low marginal costs. During the period of 1995-2005 on average 1.6 per cent of the GDP was spent on improving energy efficiency, energy conservation and deployment of renewable energy sources. In 2006-2010, these investments were as high as 3.4 per cent of the GDP, and in 2011-2015 were 5 per cent. The share of state budget funds in these investments was at least 30 per cent. This made it possible to rapidly approximate to other developed countries with similar climates in terms, for example, of such indicator as GDP energy intensity. Belarus has one of the lowest values in Europe for the carbon intensity of its energy system - about 0.3 tons in CO₂-eq. for the generation of one MWh of heat and electricity, thus approaching such countries as Japan and the USA regarding installed capacity utilization efficiency.

b) Methodological Approaches

Taking into account Decision 24/CP.19 regarding the submission of these commitments, the information on greenhouse gas emissions is based on the use of the following methodological guidelines:

- Revised Guidelines for National Greenhouse Gas Inventories, IPCC, 1996 (1997a, 1997b, 1997c).
- Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, IPCC, 2000 (2003 edition);

- 100-year Global Warming Potential values from the IPCC Second Assessment Report.

The following models and methods were used for the projection of greenhouse gas emissions:

- LEAP model (Long-range Energy Alternatives Planning) and BALANCE (energy balance) model for the power sector;
- Correlation and regression analysis for other sectors.

Fairness and ambition of the commitments

The Republic of Belarus is one of the UNFCCC Annex I countries and therefore, along with other countries included in this Annex, has to bear the main burden of commitments. The Republic of Belarus does not have additional financial resources to accelerate the adoption of best international practices and the implementation of best available technologies. In the context of existing high marginal costs and economic growth rates the ability of the country to mobilize funds and secure additional investment in low-carbon technologies is limited.

During the entire first commitment period of the Kyoto Protocol the Republic of Belarus could not attract carbon funding because its assigned amount of greenhouse gas emissions was not established (Amendment to Annex B adopted by the Parties in Decision 10/CMP.2 was not ratified), and the prospects for using instruments of the international carbon market in 2013-2020 are minimal in the context of the effect of Article 3, paragraph 7 ter of the Doha Amendment adopted by the Parties in Decision 1/CMP.8.

However, the Republic of Belarus intends to continue reducing the carbon intensity of its economy. The country acknowledges that in many sectors of the economy there is still high potential for preventing climate change. In contrast to the scenarios based on the existing development programmes, which imply reductions of emissions by 20-22% in 2030 as compared to the base year, according to some estimates it is possible to achieve an additional reduction of greenhouse gas emissions of approximately 25-30 million tonnes of CO₂-eq. during the period of 2015-2030, and the Republic of Belarus includes this possibility in its commitments.

These commitments rely solely on the internal potential of the country and are taken without any additional conditions regarding possible mobilization of foreign funds for the implementation of best available technologies. Despite the achievements in economic development and development of the market economy, the GDP (PPP) per capita remains one of the lowest among Annex I countries, while the share of investment in capital assets is insufficient to ensure expanded production.

In these conditions, the nationally determined contributions for mitigation of climate change stated by the Republic of Belarus are fair and ambitious.

Other commitments

a) Measures to increase carbon removals

Due to planned actions to ensure sustainable forest management, the forest cover of the country increased by 4.3% since 1990, and currently is continuing to grow. According to the sector-specific forestry development programme, the policy for increasing the resource potential of forests and ensuring the sustainable forest use will be further implemented. In line with the priorities of the National Sustainable Development Strategy of the Republic of Belarus until 2030, measures will be implemented to increase the area under forest from 39.4% in 2013 up to 41% in 2030.

Pursuant to the Strategy for the Implementation of the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (approved by the Resolution of the Council of Ministers of the Republic of Belarus No.361 of 29.04.2015) the Republic of Belarus in 2015-2030 will ensure the environmental rehabilitation of at least 10,000 ha of damaged bogs, thus increasing the area of restored peatlands to at least 60,000 ha by 2030 and reducing the area of degraded reclaimed land with peat soils up to 190,000 ha by 2030.

Pursuant to the Strategy for the Implementation of the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (approved by the Resolution of the Council of Ministers of the Republic of Belarus No.177 of 10.02.2009), the Republic of Belarus will undertake measures to conserve the main habitats of the populations of rare and endangered wild animals and plant species living or growing in wetlands, involving an area of at least 30,000 ha of open fen mires, 40,000 ha of floodplain meadows, and 160,000 ha of raised bogs and transitional mires.

Pursuant to the National Strategy for the Development of the System of Strictly Protected Areas until 2030 (approved by the Resolution of the Council of Ministers of the Republic of Belarus No.649 of 02.07.2014) efforts will be made to ensure further conservation of natural ecosystems, biological and landscape diversity, ensuring ecological balance of natural systems and sustainable use of protected areas covering at least 8.8% of the territory of the country.

b) Adaptation Measures

Forestry and agriculture are the sectors most vulnerable to climate change in the Republic of Belarus. Considering the significant influence of climate change on the sustainable development of the economy, and the well-being and health of the population of the country, the Republic of Belarus is formulating national policy on the adaptation to climate change through the elaboration of national strategies, sector-specific and regional programmes and plans for adaptation to climate change and their subsequent implementation. So far the Strategy for the Adaptation of Forestry to Climate Change until 2050 has been developed. The Strategy for the Adaptation of Agriculture to Climate Change is currently being developed.

In 2016-2019 the legislative and institutional basis for climate change adaptation will be formed; and mechanisms for the collection and transfer of information, fast response in emergency situations, accounting of current and future risks related to climate change, inclusion of adaptation measures into sector-specific programmes and programmes of the socioeconomic development of the Republic of Belarus and its administrative territories will be developed.

In 2017-2030, programmes of adaptation actions and practices will be developed as part of recreation and health-promotion activity, territorial development, planning of transport infrastructure, development of urban planning projects (general, special, detailed planning).

c) Assistance to developing countries

The Republic of Belarus has supported and will support developing nations, mainly in the area of awareness-raising, education, capacity building, and in the area of research and development relating to climate change issues.



BELIZE

(INDC)

Submitted to the UNFCCC on 1 October, 2015

1. National Context

Belize is a small country with relatively minor contributions to global greenhouse gas emissions and has limited capacity to contribute to mitigation of global climate change. However, Belize is committed to achieving the ultimate objective of the Convention and supports the even more ambitious target to limit the increase in global average temperature to 1.5 ° C, compared to pre-industrial levels. In light of these realities, the country has made significant strides towards fulfilling the objectives of the Convention through the development and implementation of new policies, projects and programmes and the implementation/strengthening of existing policies, regulations and projects geared towards GHG emissions abatement and overall low carbon development.

Belize is pleased to submit the first draft of its INDCs and is made on behalf of the government of Belize by the Climate Change Focal Point, without prejudice to the pending Cabinet consideration of the INDCs for which the outcome of Cabinet consideration may be different to the one submitted. Belize intends to utilize existing frameworks, policies, projects and activities that provide mitigation and sustainable development co-benefits to conceptualize the elaboration of its INDCs.

2. Belize's Mitigation Potential

Belize's mitigation potential will largely depend upon national circumstances, capacity and support. Belize's emissions profile is symptomatic of several factors including:

1. Vast extent of natural resources – a network of waterways and water bodies including 16 watersheds and numerous smaller ones), approximately 69 % remains under natural vegetation while 39.1% of the terrestrial area is made up of protected forests, and a great variety of terrestrial, marine and freshwater ecosystems¹
2. Socio-economic dependence on those resources for livelihood and for sustaining economic growth particularly through agriculture and tourism sectors;
3. A rapidly growing population (with over a third in poverty and a largely unskilled labor force).

4. Concomitantly increasing energy demands

Belize has developed several important policy frameworks over the last decade to respond to these issues with: (1) Horizon 2010-2030, (2) National Energy Policy Framework (2012-2017) (3) Sustainable Energy Action Plan 2014-2033 (4) National Climate Resilience Investment Plan (5) Growth and Sustainable Development Strategy 2014- 2017 and (6) the National Climate Change Policy, Strategy and Action Plan (2015-2020).

Horizon 2010-2030 is the national development framework that was developed after extensive stakeholder consultation inclusive of all political parties. One of its four main pillars is responsible environmental stewardship. The strategies to achieve this pillar namely integrating environmental sustainability into development planning and promoting sustainable energy for all, address the areas of concern earlier pointed out.

The National Energy Policy Framework aims to provide options that Belize can pursue for energy efficiency, sustainability and resilience over the next 30 years.

The Sustainable Energy Action Plan is a tool to achieve Belize's renewable energy and energy efficiency potential while meeting the Government's economic social and environmental goals. It provides a framework of actions and tasks to overcome barriers to sustainable energy for the period 2014-2033.

The National Climate Resilience Investment Plan provides the framework for an efficient, productive and strategic approach to building economic and social resilience and development. Special importance is given to building climate resilience and improving disaster risk management capacities across all sectors.

Growth and Sustainable Development Strategy is the guiding development plan for the period 2014 – 2017. It adopts an integrated, systemic approach and encompasses medium-term economic development, poverty reduction and longer-term sustainable development issues.

National Climate Change Policy, Strategy and Action Plan (NCCPSAP), 2015-2020, provides policy guidance for the development of an appropriate administrative and legislative framework, in harmony with other sectoral policies, for the pursuance of a low-carbon development path for Belize. In addition, the NCCPSAP also seeks to encourage the development of the country's Intended National Determined Contribution (INDC) and communicate it to the UNFCCC.

3. Mitigation

The first draft of Belize's INDCs focuses on its mitigation contribution and is framed on an action-based approach that is dependent on cost effective technology, capacity building and adequate financial support. Belize intends to provide information on adaptation at a later stage.

Information to facilitate clarity, transparency and understanding

Decision 1 CP/20 para 11 states that "small island developing states may communicate information on strategies, plans and actions for low greenhouse gas emission development..."

Belize considers that the upfront information provided addresses sectors with significant contribution to Belize's greenhouse gas emissions and satisfies the

requirement of clarity, transparency, and understanding of the aggregate effect of contributions to the achievement of the 1.5 degree C goal.

Name of Activity	Belize's mitigation actions, based on technology, financial and capacity building support are:
National REDD+ Strategy	Belize's contribution will address issues of deforestation and afforestation, maintaining healthy forest ecosystems by sustainable forest management, and increasing the resilience of human communities, especially those whose livelihoods depend on the use of forestry resources. Therefore, Belize will reduce greenhouse gas emissions from deforestation, and from forest degradation, conservation of forest carbon stocks, sustainable management of forests, enhancement of forest stocks through the development of a REDD+ strategy.
Key Biodiversity Protected Areas	Belize's contribution will also address the management and protection of key biodiversity areas that will support forest protection and sustainable forest management plans and practices in targeted Protected Areas (PAs), rehabilitation of critical areas of high conservation value by local communities, and community-based sustainable use of ecosystem goods and services; (ii) improving management and monitoring of PAs, including development and implementation of management plans in the targeted PAs, and improving legal framework for the protection of biodiversity and forests;
Transport Sector	<p>Belize's contribution is to achieve at least a 20% reduction in conventional transportation fuel use by 2033 and promote energy efficiency in the transport sector through appropriate policies and investments:</p> <p>These improvements include:</p> <ul style="list-style-type: none"> • Undertaking a traffic management study aimed at reducing traffic congestion in urban areas and along the Philip Goldson Highway into Belize City; • Improving public transportation; • Upgrading maintenance of bus fleet; • Improving scheduling; • Upgrading the industrial fleet; • Promoting the use of bio-fuels;
Sustainable Energy Plan	<p>Belize's contribution will be conducted through its Sustainable Energy Action Plan to improve energy efficiency and conservation in order to transform to a low carbon economy by 2033. The Sustainable Energy Action Plan has as its objective the reduction of Belize's GHG emissions by 24 million metric tonnes of CO₂e over the period 2014-2033.</p> <p>In addition, Belize expects to increase its share of its renewable energy (RE) in Belize's electricity mix by 85% by 2027 with a 62% carbon dioxide emissions reduction compared to a business as usual scenario (BAU).</p> <p>The strategic elements in the Plan are as follows:</p> <ol style="list-style-type: none"> 1. Improve Energy Efficiency to dramatically lower energy intensities

	<p>across key economic sectors Transport, Industry, Buildings (Commercial & Residential), Public lighting and Agriculture</p> <ul style="list-style-type: none"> • Improve energy efficiency in buildings and appliances. • Promote transition to sustainable transportation. • Develop appropriate financial and market-based mechanisms that support energy efficiency and renewable energy. <p>2. Develop Renewable Energy to shift the energy matrix away from fossil fuels (especially oil) to alternative renewable energy technologies.</p> <ul style="list-style-type: none"> • Develop Belize’s human, technological and institutional capacity to accelerate the uptake of appropriate clean energy and clean production technologies. <p>3. Promote and facilitate Clean Production systems in the processing of Agriculture and Forestry outputs to co-produce bio-fuels and/or electricity.</p> <ul style="list-style-type: none"> • Promote the adoption of appropriate processing technologies to convert biomass from waste, forestry, agriculture and microbial production into food, feed, fibre, chemicals and energy (electricity, heat and bio-fuels). <p>4. Enhancing national capacity in clean energy and clean production by developing human, technological, and institutional resources.</p> <ul style="list-style-type: none"> • Build the capacity of the Ministry of Energy, Science & Technology and Public Utilities (MESTPU) and supporting institutions with regard to effectively fulfilling their mandates. • Strengthen the ongoing development of an appropriate legal and regulatory framework, and other policy mechanisms to support the mainstreaming of the clean energy and clean production technologies. • Strengthen the Planning and Coordination functions of the MESTPU. <p>5. Promote and support universal access to affordable modern energy services including energy infrastructure.</p> <ul style="list-style-type: none"> • Expand access to electricity, clean fuels, water and sanitation for under-served communities and households. • Upgrading the electric grid and supply infrastructure to make it a smarter, more unified and integrated energy system
<p>Nation-wide improvements in the management of solid waste and reduction in the generation of GHG emissions.</p>	<p>Develop and implement a country-wide Integrated Solid Waste Management Programme for Belize. Such a programme will seek to address and enhance current initiatives including:</p> <ul style="list-style-type: none"> • Institutional strengthening • Waste segregation, storage, collection and transport, • Waste minimization, re-use and recovery • Education awareness ad stakeholder communications <p>Develop a solid waste mitigation strategy, and a detailed nationally appropriate mitigation action (NAMA) plan, including measuring, reporting and verification (MRV) and financing and support options for Clean Development Mechanism (CDM) projects, capping and closing open dumps, capturing and utilizing landfill gas, and ensuring proper waste handling and organics management.</p>
<p>Scope and coverage</p>	<p>Sectors covered: Energy and Land Use, Land Use Change and Forestry Gases covered: carbon dioxide</p>

Geographical coverage:	The INDC contribution will be national.
Intention to Use Market Mechanisms	Belize is willing to explore the potential of market mechanisms including CDM and other mechanisms under the UNFCCC process that demonstrate environmental integrity, result in real, permanent, additional, verified mitigation outcomes, prevent double counting and be easily accessible.
Assumptions and methodological approaches for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals	<p>The methodology for calculating emissions reductions for the electricity sector was based on the energy demands and consumption over the period 2014-2025.</p> <p>Greenhouse gas emission reduction from Land Use, Land Use Change and Forestry is not yet determined.</p>
Conditionality	Each activity is geared to address the sectors with significant contributions to Belize's greenhouse gas emissions. These are activities for which Belize will access international support for finance, technology and capacity and most importantly have the potential to provide co-benefits for sustainable development.
Unconditional	Enabling the existing policies, laws and projects, staff time and integration of development and climate change activities.

3. Fairness and Ambition

Currently Belize as a Small Island Developing States contributes less than 0.01 percent to the global emissions and accounts for a small share of past and current greenhouse gas emissions. Yet, Belize remains committed to strategically transition to a low carbon and climate resilient future and provides a fair contribution to the global efforts towards reaching a legally binding agreement in COP 21 in Paris.

Additional information

Belize's Climate Change Action Plan

Belize's Climate Change Action Plan focuses on building the capacity and resilience of the country to meet the challenges of climate change. In Belize, like most SIDs, GHG emissions are relatively small, but international commitments as well as opportunities to benefit from associated mitigation initiatives (reduced deforestation and energy conservation) has prompted their inclusion in the development of the National Climate Change Policy Strategy and Action Plan. Agriculture, land-use change and the forestry sector are considered prime areas for Climate Change adaptation but are also known to be contributors to GHG emissions and will require the development of policy initiatives to reduce such threats. The energy and transportation sectors, because of the benefits to be derived through the pursuit of sustainable energy and low-carbon development initiatives, will also require policy initiatives which seek to limit emissions of GHGs. Belize identified the following key sectors for which adaptation and mitigation strategy and action plans will be addressed are:

- Agriculture
- Forestry
- Fisheries and Aquaculture
- Coastal and Marine Resources
- Water Resources
- Land use and Human Settlements
- Human Health
- Energy
- Tourism
- Transportation
- Solid Waste
- Infrastructure

Enhance Food security and sustainability as per Article 2 of the Convention: Agriculture is critical to Belize's development, given its importance both in terms of food self-sufficiency, employment, and being one of the country's major exports and earnings of foreign exchange. Belize has developed a National Agriculture Sector Adaptation Strategy to Address Climate Change in Belize, in order to combat the detrimental effects of Climate Change. These recommendations include both short and long-term measures to address critical gaps in technological developments relevant to crop production, better soil management practices, diversification into drought resistant crops and livestock, and farm production adaptations which include, but is not limited to, land use, land topography and increasing use of low-water irrigation systemsⁱⁱ.

The estimated cost for planned activities totals approximately USD \$13,000,000.

Integrating Climate Change in Revised National Forest plan: Belize is well known for its pristine forests and is reported to have the highest forest cover in both Central America and the Caribbean (62% as a percentage of land, 37% of which are primary forests).

However, the forests of Belize (and its biodiversity), like other natural resource sectors, are anticipated to be impacted by the various manifestations of Climate Change. The proposed interventions to mainstream adaptation and mitigation to Climate Change will be achieved by providing guidance for actions that concerns the direct and indirect threats posed by global Climate Change on forests and forest dependent people in order to reduce their vulnerability, increase their resilience and adaptation to Climate Change. The estimated cost for planned activities totals approximately USD 5,158,000.

Sustainable management of the Fisheries Sector: The fisheries sector is important to Belize because it is an important food source, provides an income and livelihood for several persons as well as an earner of important foreign exchange. Given the importance of the fisheries sector as a source of food and earner of foreign exchange, it is imperative that management measures are introduced to ensure its sustainability including addressing the threats of Climate Change. Interventions under the fisheries sector aim to achieve the sustainable management of the fisheries resources, and the conservation and preservation of fisheries resources and marine habitats in promoting reef ecosystem resilience. Estimated cost is approximately USD 500,000-750,000.

Adoption and Implementation of the Belize Integrated Coastal Zone Management Plan: The importance of the coastal zone in the productive sector of Belize is increasing rapidly. Most industries in Belize are either directly or indirectly reliant on some component of the coastal environment to function. Industries such as fishing and tourism are dependent on the organisms that inhabit the coastal area to sustain them. Other industries such as agriculture, aquaculture, and petroleum use the coastal waters to transport their products, thereby allowing them to engage in overseas trade. Rapid economic development, directly attributed to tourism and recreational activities and population growth, have led to increasing pressures on coastal and marine resources, with implications to the livelihoods of those that depend upon them. These anthropogenic threats are compounded by natural hazards, global warming and rising sea levels and the vulnerability of sensitive coastal ecological systems to Climate Change. It is therefore, imperative to ensure that the coastal zone is managed and utilized in a manner that will continue to support important ecological functions, as well as social, cultural and economic prosperity for current and future generations. The overall objective is to promote the adoption and implementation of the Belize Integrated Coastal Zone Management Plan which will ensure responsible and sustainable use of Belize's coastal and marine resources in the face of Climate Change. The cost of activities to promote the adoption and implementation of the Belize Integrated Coastal Zone Management Plan is estimated at approximately USD 500,000 annually.

Improved integrated water resource management: Due to its geographic location, relatively high level of forest cover, and 18 different water catchment areas, Belize is recognized as having an adequate supply of freshwater. However, like other resource sectors, a number of anthropogenic factors (increases in demand due to expansion in the agricultural, industrial and tourism sectors, a growing population and accompanying water pollution and watershed destruction), together with impending threats of Climate Change, are placing a heavy strain on the sustainability of this resource. The overall goal is to enhance the protection and restoration of forest ecosystems and build the resiliency of water catchment areas. Resources including estimated cost for the following planned activities are yet to be determined.

Integrate Climate Change in the Tourism sector: In Belize, like most other SIDS, most of the tourist assets are located within the narrow coastal belt and the growth of the industry is perceived as having a potential detrimental effect on the environmental resources on which it is dependent. The goal is to assess the vulnerability of Belize's tourism system to Climate Change and ensuring the mainstreaming of Climate Change considerations throughout the sector to enhance ecosystem resilience, equitable distribution of tourism activities and fostering of sustainable tourism development, at a local and national scale.

Building resilience of human settlements: The strategy is to promote the adoption of an integrated land tenure and land classification policy and developing and implementing programmes which discourage the establishment of human settlements in areas prone to natural hazards (flooding, land slippages, high winds and storm surges), and develop housing and settlement patterns/practices that enhance Climate Change adaptation and are resilient to Climate Change.

The resources included estimated cost for the following planned activities are yet to be determined.

Enhance resiliency of Transportation sector: Several of Belize's roads and bridges are vulnerable to seasonal floods. Belize's waterways also become un-navigable during certain periods. In the absence of a transport policy, it is imperative that a vulnerability assessment is undertaken with greater focus being placed on assessing the vulnerability of the transport infrastructure, particularly in urban areas and other areas which are critical in sustaining the country's productive sectors (tourism, agriculture and ports). An improved and energy efficient transport sector will not only reduce the country vulnerability to storm surges and floods, but also assist in reducing GHG emission. The resources included estimated cost for the following planned activities are yet to be determined.

Strengthened and improved human health: It is important that the Ministry of Health undertake a Vulnerability and Capacity assessment for the health sector. This is important for the country to be well informed of the impacts of Climate Change on the health sector and the adoption of practices and technologies that will reduce exposure and health impacts from extreme heat, and improve physical infrastructure of health institutions and their functional capacity. The resources included estimated cost for the following planned activities are yet to be determined.

Improved waste management: Until a few years ago, the uncontrolled dumping and burning of garbage, as a form of final disposal throughout Belize, was quite common. Such practices, compounded by inadequate waste collection systems and the lack of technical and environmental controls have impact on the health of the population and pollution of the nearby ocean, thereby affecting coral reefs and affecting the livelihood of thousands of Belizeans whose livelihoods are directly and indirectly linked to fishing and eco-tourism. The overall goal is to implement a National Integrated Waste Management Programme including programmes to reduce, reuse, recover and recycle, solid waste and reduce GHG emissions into the atmosphere.

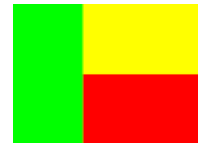
The resources included estimated cost for the following planned activities are yet to be determined.

National Climate Resilience Investment Plan

The Government of Belize developed its National Climate Resilience Investment Plan (NCRIP) that seeks to improve Belize's climate resilience to support the country's economic growth and safety of its citizen. It is a cross-sectoral plan that identifies both physical and non-physical interventions that take into account current and future risks posed by current and future climate variability. The NCRIP is expected to be integrated by Government of Belize into its Growth and Sustainable Development Strategy and is aligned with the Horizon 2010-2030. The cost of implementation is approximately USD 231.4 million.



FRATERNITE -JUSTICE-TRAVAIL



REPUBLIQUE DU BENIN

**MINISTERE DE L'ENVIRONNEMENT CHARGE DE LA GESTION DES
CHANGEMENTS CLIMATIQUES DU REBOISEMENT ET DE LA PROTECTION
DES RESSOURCES NATURELLES ET FORESTIERES**

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**CONTRIBUTIONS PREVUES DETERMINEES AU NIVEAU
NATIONAL
(CPDN)**

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RESUME EXECUTIF

Les Contributions Prévues Déterminées au niveau National (CPDN) de la République du Bénin s'appuient sur des mesures contenues dans ses Programmes nationaux de Réduction de la Pauvreté et de Gestion des Changements Climatiques dont l'objectif global est de contribuer au développement durable et résilient aux changements climatiques en apportant des solutions adéquates aux défis liés aux changements climatiques.

Elaborée à partir d'une démarche participative et inclusive ayant impliqué différentes parties prenantes (institutions publiques, secteur privé, société civile), la CPDN du Bénin situe la progression du pays dans la lutte contre les changements climatiques à l'horizon 2030 afin de contenir l'accroissement du réchauffement global en deçà des 2 degrés Celsius comme recommandé par la communauté internationale.

Dans le domaine de l'atténuation, le Bénin prévoit réduire globalement ses émissions cumulées de Gaz à Effet de Serre (hors secteur foresterie) par rapport au scénario de maintien du statu quo d'environ 21,4 % sur la période 2021 à 2030.

La part des efforts nationaux est de l'ordre de 16,4 % et celle de la contribution conditionnelle est de 83,6 %. La mise en œuvre des mesures envisagées pourrait également contribuer à accroître la capacité de séquestration du carbone cumulée du Bénin par rapport au scénario de maintien du statu quo de 5,7 % sur la période 2021-2030 à travers la réduction du taux annuel de déforestation des forêts naturelles de 41,7 %. Au titre de cet objectif, la contribution inconditionnelle est de l'ordre de 24,6 % et la contribution conditionnelle est d'environ 75,4 %. Par ailleurs, la réduction du taux annuel de déforestation de 41,7 % pourrait permettre au Bénin de réduire ses émissions cumulées dues au secteur de la foresterie par rapport au scénario de maintien du statu quo d'environ 110 Mt E-CO₂ sur la période 2021-2030. La part de la contribution inconditionnelle dans l'atteinte de cet objectif est de l'ordre de 20 % et celle de la contribution conditionnelle est de 80 %.

Par rapport à l'adaptation, les niveaux de vulnérabilité de la République du Bénin au plan national, sont en général moyens et parfois élevés. Tous les moyens et modes d'existence sont très vulnérables aux effets des changements climatiques. Les principaux secteurs concernés sont l'agriculture, les ressources en eau, la foresterie, la zone côtière, la santé humaine et l'énergie. Les principaux objectifs visés au titre de la CPDN concernent la réduction de la vulnérabilité des systèmes socio-économiques et des écosystèmes à la variabilité et aux changements climatiques en adoptant des politiques et mesures appropriées. Il s'agira donc de renforcer les systèmes de prévision de risques climatiques et d'alerte rapide pour la sécurité alimentaire dans les zones agro écologiques vulnérables, de renforcer la disponibilité des ressources en eau notamment pendant les périodes sèches, de protéger la zone côtière face à l'élévation du niveau de la mer et de contribuer au financement de l'adaptation au niveau des collectivités locales à travers le renforcement de la gouvernance locale en matière de planification et de budgétisation des activités.

La République du Bénin, pour réaliser ses ambitions d'atténuation des Gaz à Effet de Serre (GES) et d'adaptation aux effets néfastes des Changements Climatiques, aura besoin d'une enveloppe financière globale de l'ordre de 30 milliards dollars US dont 2,32 milliards comme contribution du Gouvernement béninois sur la période allant de 2021 à 2030. Les parts qui reviennent aux mesures d'atténuation et d'adaptation sont respectivement de 12,13 et de 18,35 milliards de dollars US.

Ce rapport portant sur la CPDN qui ne saurait être exhaustif, revêt un caractère dynamique et pourrait donc être affiné à la lumière de nouvelles données et informations. La Stratégie de Développement Sobre en Carbone et résilient aux Changements Climatiques en cours d'élaboration ainsi que le Plan National d'Adaptation constituent des opportunités d'opérationnalisation des engagements contenus dans ce document.

I. CIRCONSTANCES NATIONALES

La République du Bénin est située en Afrique Occidentale dans le Golfe de Guinée, entre les latitudes 6°30' et 12°30'N et les longitudes 1° et 3°40'E. Elle couvre une superficie de 114 763 km². Avec un taux moyen annuel de croissance démographique égal à 3,5 %, sa population est estimée à environ 10.725.000 habitants pour l'année 2015.

Deux types de climat régissent le pays à savoir : le climat subéquatorial dans le Sud et le climat tropical continental dans le Nord.

Le Bénin est un pays en développement dont l'économie repose surtout sur l'agriculture, le commerce et le transport avec les pays voisins. Cette caractéristique justifie les valeurs élevées des émissions de GES estimées pour l'agriculture et le transport par rapport aux autres secteurs en 2000. En dépit des efforts consentis sur le plan économique, le Produit Intérieur Brut (PIB) demeure en dessous du taux minimum de 7 % requis pour atteindre les Objectifs du Millénaire pour le Développement (OMD).

Les changements climatiques constituent un phénomène de dimension planétaire dont les conséquences se font ressentir aux plans national et local. Ce phénomène constitue une préoccupation du Gouvernement béninois qui développe des actions sur la base d'objectifs et d'orientations clairement définis à travers les structures étatiques, les collectivités locales, le secteur privé et les organisations de la société civile. Ces actions concernent entre autres :

- les aspects institutionnels à travers la création du Ministère de l'Environnement Chargé de la Gestion des Changements Climatiques du Reboisement et de la Protection des Ressources Naturelles et Forestières (MECGCCRPRNF), de la Direction Générale des Changements Climatiques (DGCC), du Fonds National pour l'Environnement et le Climat (FNEC) et de la mise en place du Programme National de Gestion des Changements Climatiques (PNGCC), la mise en place du Comité National sur les Changements Climatiques (CNCC), la mise en place de la Commission de Modélisation Economique des Impacts du Climat et de l'Intégration des Changements Climatiques dans le Budget Général de l'Etat (CMEICB) ;
- les aspects opérationnels relatifs aux mesures d'adaptation, d'atténuation et de renforcement des capacités nationales et locales.

Dans le souci de mettre en œuvre les recommandations du Sommet de la Planète Terre en 1992 (Rio de Janeiro), le Bénin a créé la Commission Nationale du Développement Durable (CNDD) et a élaboré son Agenda 21 national. Ce document de politique nationale de développement durable, comporte les orientations à long terme, les actions, les objectifs et les moyens d'exécution pour promouvoir le développement durable.

A cet égard, le Bénin s'est fixé les priorités suivantes : (i) réduire la pauvreté en liaison étroite avec la Stratégie de Croissance pour la Réduction de la Pauvreté (SCR3) ; (ii) maintenir un niveau élevé de croissance économique ; (iii) intégrer la problématique de l'environnement dans les politiques, stratégies, plans, programmes et projets de développement.

A l'instar des autres Pays les Moins Avancés (PMA), le Bénin reste un pays particulièrement vulnérable à la variabilité et aux changements climatiques. A travers son engagement dans le processus de mise en œuvre de la Convention-Cadre des Nations Unies sur les Changements Climatiques (CCNUCC) au même titre que d'autres Etats Parties, la République du Bénin s'est fixée les objectifs suivants :

- réduire la vulnérabilité des systèmes socio-économiques et des écosystèmes à la variabilité et aux changements climatiques en adoptant des politiques et mesures à moindre coût ;
- promouvoir des politiques et mesures visant à atténuer les changements climatiques ;

- développer des initiatives en matière d'atténuation et d'adaptation aux fins d'un développement durable ;
- participer à l'effort mondial de réduction des émissions de gaz à effet de serre ;
- promouvoir le transfert de technologie et le savoir-faire nécessaire en matière d'adaptation et d'atténuation aux changements climatiques ;
- promouvoir la recherche scientifique et technologique en matière d'adaptation et d'atténuation aux changements climatiques.

Le présent document a été élaboré sous la houlette du Ministère de l'Environnement Chargé de la Gestion des Changements Climatiques, du Reboisement et de la Protection des Ressources Naturelles et Forestières (MEGCCRPRNF) avec l'appui de l'Agence Française de Développement (AFD) et du Programme des Nations Unies pour l'Environnement (PNUE), selon une approche participative impliquant un groupe d'experts nationaux émanant du Comité National sur les Changements Climatiques et des experts de l'AFD ainsi que d'autres acteurs clés au niveau national notamment les représentants des ministères sectoriels, des Organisations de la Société Civile et du secteur privé. Il intègre les données et informations recueillies auprès de ces acteurs et a été validé puis adopté en Conseil des Ministres.

Le document s'articule autour de deux grandes thématiques à savoir l'Atténuation et l'Adaptation, y compris les aspects transversaux.

II. ATTENUATION

La République du Bénin fait partie des Pays les Moins Avancés (PMA) dont les émissions de gaz à effet de serre (GES) sont estimées à environ 6,3 Méga tonne Equivalent-CO₂ (Mt E-CO₂), soit environ 1 tonne E-CO₂ par habitant en 2000, secteur Utilisation des Terres, Changements d'Affectation des Terres et Foresterie (UTCATF) exclu. Ces émissions proviennent principalement des secteurs de l'agriculture et de l'énergie dont les contributions sont estimées à 68 % et 30 % respectivement (Figure 1).

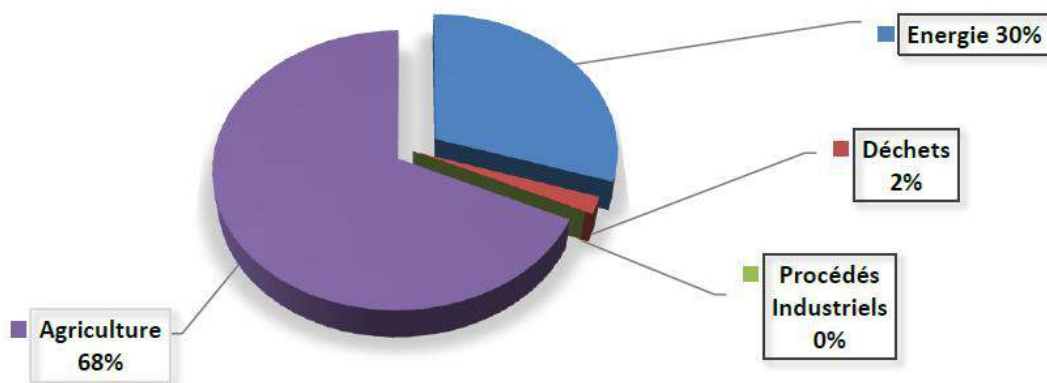


Figure 1 : Contribution de chaque secteur aux émissions globales de GES au Bénin en 2000.

En tenant compte du secteur UTCATF, le bilan des émissions (6,3 Mt E-CO₂) et des absorptions (11,3 Mt CO₂) de GES montre que le Bénin est globalement un puits de GES avec une capacité d'absorption de 5,1 Mt CO₂ en 2000, c'est-à-dire que ses émissions de GES sont largement compensées par l'absorption du CO₂ au niveau de son couvert forestier. Quoique le Bénin demeure un puits, sa capacité de séquestration du carbone, voire d'absorption du CO₂, au niveau de son couvert végétal est en régression, passant de (-16,5) Mt E-CO₂ en 1990 à (-11,3) Mt E-CO₂ en 2000, soit une diminution de 31 %, et à (-9,6) Mt E-CO₂ en 2005, soit une diminution de 40 %.

L'évaluation des tendances des émissions globales de GES (hors UTCATF) et des émissions dans les secteurs de l'agriculture et de l'énergie dans le contexte de maintien du statu quo sur la série temporelle 2000-2030 est traduite par la Figure 2. La tendance des émissions globales montre un accroissement de 258,3 %, celle du secteur de l'agriculture de 178,1 % et celle du secteur de l'énergie de 321,0 % sur cette période. Le total des émissions cumulées de GES sans aucune intervention sur la période 2021-2030 avoisine 193 Mt E-CO₂ (secteur UTCATF exclu).

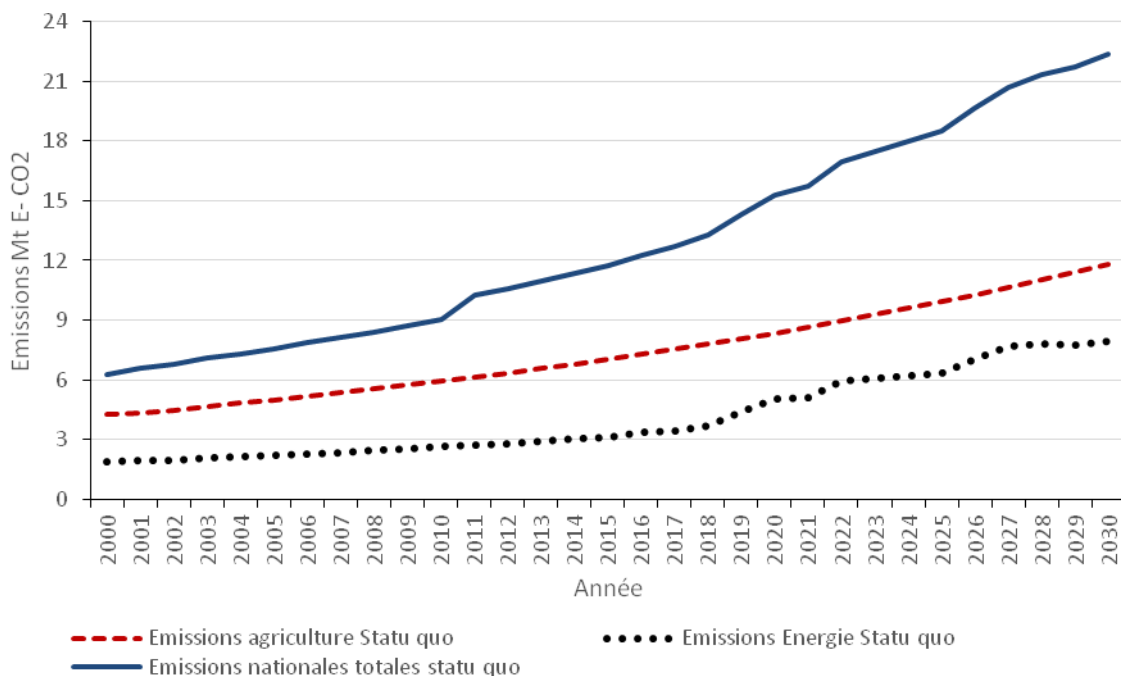


Figure 2 : Tendance des émissions globales et des émissions dans les secteurs de l'agriculture et de l'énergie (2000-2030) – scénario maintien du statu quo.

La tendance des émissions globales et des émissions dans les secteurs clés à partir de l'année 2000 fait apparaître la nécessité de prendre des mesures d'atténuations sans compromettre les priorités de développement économique et social (**Figure 2**). De nombreuses opportunités d'atténuation des émissions de GES ont été identifiées à cet effet.

Au niveau institutionnel, la création d'une Direction de l'Atténuation des Changements Climatiques et de la Promotion de l'Economie Verte au Ministère en charge des changements climatiques et la Direction des Energies Nouvelles et Renouvelables au Ministère en Charge de l'Energie, offre un cadre technique de promotion et de coordination des actions. Au niveau opérationnel, les secteurs de l'agriculture et de l'énergie, y compris les transports, portent les principaux leviers d'action. Par rapport au secteur de l'énergie, il s'agit d'une large marge d'amélioration de l'efficacité énergétique, de la conversion des sources de production (gaz naturel, énergie solaire photovoltaïque, énergie hydroélectrique) et de consommation d'énergie et de la logistique « Transports ». Il s'agit également d'un fort potentiel d'amélioration des itinéraires techniques culturaux, sylvicoles et des modes d'élevage dans le secteur de l'agriculture. Les projets « Villes Durables », « Lumière pour Tous » et « Développement sobre en carbone », en cours de conception ou d'élaboration avec l'appui de l'AFD et d'autres partenaires, constitueront des opportunités complémentaires lorsqu'ils seront mis en œuvre. Par ailleurs, dans le secteur de l'UTCATF, la mise en œuvre des aménagements durables des forêts naturelles et le renforcement des efforts de reforestation/plantation offrent des opportunités de réduction de l'intensité de régression de la capacité de séquestration du carbone des écosystèmes forestiers au Bénin.

Fort des considérations précédentes, le Bénin dans sa soumission, présente une contribution à l'atténuation de GES fondée sur des mesures contenues dans des stratégies, programmes et projets pour la période 2021– 2030 avec une spécification des secteurs d'activité et des GES considérés. Les principales stratégies sectorielles et les objectifs permettant la mise en valeur de la contribution ainsi que les hypothèses et approches méthodologiques sont présentés dans les Tableau 1 et Tableau 2 et illustrés par les Figures 3, 4 et 5.

Tableau 1: Mesures au titre des contributions prévues déterminées au niveau national à l'atténuation

Calendriers et/ou périodes de mise en œuvre	
Calendrier de mise en œuvre	2021-2030
Année de référence	2000
Type d'engagement	Contribution fondée sur des mesures contenues dans des stratégies, programmes et projets
Objectifs	
Objectif global	La mise en œuvre des mesures envisagées est susceptible de contribuer à réduire les émissions cumulées de GES (hors UTCATF) par rapport au scénario de maintien du statu quo d'environ 21,4 % d'ici à 2030 (Figure 3). La contribution inconditionnelle correspond à une réduction des émissions cumulées de GES par rapport au scénario de maintien du statu quo de 3,5 % d'ici 2030. La contribution conditionnelle pourrait permettre une réduction additionnelle des émissions cumulées de GES de 17,9 % par rapport au scénario de maintien du statu quo d'environ 3,5 % d'ici 2030. La mise en œuvre des mesures envisagées pourraient également contribuer à accroître la capacité de séquestration cumulée du Bénin par rapport au scénario de maintien du statu quo de 5,7 % sur la période 2021-2030 à travers la réduction du taux annuel de déforestation des forêts naturelles de 41,7 %. Au titre de cet objectif, la contribution inconditionnelle est de l'ordre de 1,4 % et la contribution conditionnelle est d'environ 4,3 %. La réduction du taux annuel de déforestation pourrait permettre au Bénin de réduire ses émissions cumulées dues au secteur de la foresterie par rapport au scénario de maintien du statu quo d'environ 110 Mt E-CO ₂ sur la période 2021-2030. La part de la contribution inconditionnelle dans l'atteinte de cet objectif est de l'ordre de 20 % et celle de la contribution conditionnelle est de 80 %.
Objectifs sectoriels	<ul style="list-style-type: none"> • Secteur de l'agriculture <ul style="list-style-type: none"> • Mesures relatives au secteur de l'agriculture (Tableau 1 en annexe) <p>Les mesures envisagées portent sur la promotion des techniques culturales améliorées dans le cadre de la production végétale. La mise en œuvre de ces mesures touchera aux catégories de sources comme les rizières, les sols agricoles, le brûlage des résidus agricoles, le brûlage dirigé des savanes.</p> <ul style="list-style-type: none"> • Emissions évitées escomptées dans le secteur de l'agriculture (Figure 4) <p>Les efforts d'amélioration des itinéraires techniques visant la limitation de la fermentation méthanique et des émanations d'oxyde nitreux dues à la nitrification/dénitrification dans les systèmes de culture permettraient d'éviter les émissions cumulées de ces gaz à hauteur d'environ 20,9 Mt E CO₂ par rapport au scénario de maintien du statu quo, soit une réduction de 20,6 % d'ici 2030 (contribution conditionnelle).</p> <ul style="list-style-type: none"> ❖ Secteur de l'énergie <ul style="list-style-type: none"> • Mesures relatives au secteur de l'énergie (Tableau 1 en annexe) : <p>- accroissement de la capacité nationale de production d'énergie électrique et promotion de l'utilisation du gaz naturel et des énergies renouvelables dans la production d'électricité à partir (i) des centrales bicom bustibles pouvant fonctionner au</p>

fioul ou au gaz naturel (400 MW), (ii) des centrales hydroélectriques (quatre centrales hydroélectriques totalisant une capacité à installer de 396,6 MW); (iii) des centrales solaires photovoltaïque (54,2 MWC) ;

- promotion de l'utilisation efficace du bois-énergie ainsi que l'utilisation du Gaz de Pétrole Liquéfié (GPL) comme énergie alternative de cuisson dans les ménages à travers (i) la promotion de l'accès de 270.000 ménages utilisant du kérosène à l'éclairage à l'électricité dans les localités qui seront raccordées aux réseaux de la Société Béninoise d'Énergie Électrique (SBEE) et (ii) l'économie du bois énergie par la promotion de l'accès (i) de 140.000 nouveaux ménages aux foyers améliorés et de (ii) 275.000 ménages aux équipements de cuisson.

- **Emissions évitées escomptées dans le secteur de l'énergie (Figure5)**

La mise en œuvre de ces mesures contribuera à réduire les émissions cumulées de GES dans ce secteur par rapport au scénario de maintien du statu quo de 19,4 Mt E CO₂ d'ici 2030, soit 28,6 % dont 18,6 % de contribution conditionnelle. Les émissions cumulées évitées se répartissent comme suit : (i) production d'électricité 63,4 % dont 46,9 % de contribution conditionnelle ; (ii) promotion de l'éclairage public aux fins de l'économie de kérosène 35,1 % dont 17,5 % de contribution conditionnelle ; (iii) économie de bois-énergie par la promotion de foyers améliorés 1,3 % dont 1,1 % de contribution conditionnelle.

❖ **Secteur UTCATF**

- **Mesures relatives au secteur de l'UTCATF (Tableau 1 en annexe)**

Le Bénin envisage d'accroître la capacité de séquestration du carbone de ses écosystèmes forestiers à travers la mise en œuvre des aménagements durables des forêts naturelles et le renforcement des efforts de reforestation/plantation. Les actions envisagées sont susceptibles de contribuer à :

- la protection et à la conservation des forêts naturelles, ce qui permettrait de réduire et de maintenir le taux de déforestation à 35 000 ha/an au lieu de 60.000 ha/an actuellement ;
- la mise en œuvre d'un plan de reboisement avec pour objectif de créer 15 000 ha de plantation forestière par an.

- **Objectifs dans le secteur de l'UCATF**

L'impact attendu de la mise en œuvre des mesures visant à limiter la déforestation est estimé pour les émissions évitées à 110 Mt E CO₂ et pour la séquestration du carbone à 32 Mt E CO₂ durant la période 2021-2030.

✓ **Objectifs inconditionnels relatifs au secteur UTCATF :**

- réduction des émissions cumulées dues au secteur UTCATF pendant la période 2021-2030 de 22 Mt E CO₂ par rapport au scénario maintien du statu quo à travers la réduction du taux annuel de déforestation de 5.000 ha/an.

- augmentation de la séquestration du carbone cumulée des forêts naturelles pendant la période 2021-2030 de 12,9 Mt CO₂ par rapport au scénario maintien du statu quo à travers la réduction du taux annuel de déforestation de 5.000 ha/an et la création de 15.000 ha de plantations forestières par an.

✓ **Objectifs conditionnels relatifs au secteur UTCATF:**

- réduction des émissions cumulées dues au secteur UTCATF pendant la période 2021-2030 de 88 Mt E CO₂ par rapport au scénario maintien du statu quo à travers la réduction du taux annuel de déforestation de 20.000 ha/an.

- augmentation de la séquestration des forêts naturelles pendant la période 2021-2030 de 19,1 Mt CO₂ (cumul des émissions évitées) par rapport au scénario maintien du statu quo à travers la réduction du taux annuel de déforestation de 20.000 ha/an.

Champ d'application et portée	
Gaz à effet de serre considérés dans la contribution	Dioxyde de carbone (CO ₂), méthane (CH ₄), oxyde nitreux (N ₂ O)
Secteurs/sources couverts par la contribution ¹	- Energie (transport, secteur résidentiel, industries énergétiques) - Agriculture (sols agricoles, rizières, brûlage des résidus agricoles, brûlage dirigé des savanes). - UTCATF (terres forestières incluant les forêts naturelles et les plantations).
Étendues géographiques couvertes par la contribution	Tout le territoire national

Tableau 2 : Hypothèses et approches méthodologiques

Méthodologie pour la comptabilisation des émissions pour l'année de référence	L'inventaire de l'année de référence est celui de la Deuxième Communication Nationale (DCN) du Bénin sur les Changements Climatiques. Les Directives Révisées de 1996 du GIEC pour les inventaires nationaux de GES (GL 1996), les Recommandations du GIEC en matière de bonnes pratiques et de gestion des incertitudes pour les inventaires nationaux de GES (GPG 2000) ont été utilisées pour tous les secteurs sauf le secteur UTCATF.
Approche concernant les émissions relatives au secteur de l'UTCATF pour l'année de référence.	Les Recommandations du GIEC en matière de bonnes pratiques pour le secteur UTCATF (GPG 2003), les Lignes directrices 1996 du GIEC.
Méthodologie de projection des émissions du scénario de statu quo	<p>Emissions globales : L'évaluation de la tendance des émissions globales de GES dans un contexte de maintien du statu quo sur la série temporelle 2000-2030 a été faite par extrapolation à partir des données démographiques et de l'émission de GES par habitant. Les résultats obtenus à partir de l'extrapolation ont été ajustés pour tenir compte des émissions estimées pour le secteur de l'Energie sur la période 2016-2030 sur la base des GPG 2000 et des GL 1996. Les émissions annuelles de GES par habitant ont été estimées à 1 t E-CO₂ pour l'année 1990-2010 sur la base des données présentées dans la DCN et à 1,1 t E-CO₂ pour la période 2011 -2030².</p> <p>Secteur de l'énergie : Période 1990-2015 : l'évaluation de la tendance des émissions a été faite par extrapolation à partir des données démographiques et de l'émission de GES par habitant (0,29 t E-CO₂ par habitant) estimée sur la base des émissions du secteur énergie en 2000 (DCN, 2011); Période 2016-2030 : l'évaluation de la tendance des émissions a été faite sur la base des GPG 2000 et des GL 1996 et des données sur les quantités de combustibles requises pour couvrir les besoins du pays en énergie électrique.</p> <p>Secteur de l'agriculture : L'évaluation de la tendance des émissions de GES sur la série temporelle 2000-2030 a été faite par extrapolation à partir des données démographiques et de l'émission de GES par habitant dans le secteur de l'agriculture estimée sur la base des émissions du secteur en 2000 (DCN, 2011).</p>
Méthodologie de projection des émissions du scénario avec mesures	<p>Secteur de l'énergie : GPG 2000 et GL 1996</p> <p>Secteur de l'agriculture : 500 000 ha de terres de culture seront touchées chaque année à travers la mise en œuvre des mesures envisagées dans le Tableau 1 en annexe.</p> <p>La mise en œuvre des mesures sur ces 500 000 ha de terre contribuera à réduire globalement les émissions annuelles provenant des rizières, des sols agricoles, du</p>

¹ Les secteurs préconisés par les Directives techniques du GIEC pour l'établissement des inventaires nationaux des GES

² <http://cait.wri.org/profile/Benin>

	brûlage des résidus agricoles, du brûlage dirigé des savanes de 30 %.
Méthodologie de projection des émissions du scénario avec mesures dans le secteur UTCATF	Le taux annuel de déforestation totale au niveau des forêts naturelles est estimé à 60 000 ha ; émission liée à la déforestation d'un hectare de forêt naturelle : 120 t E-CO ₂ ; capacité de séquestration des forêts naturelles tropicales 4 t E-CO ₂ /ha/an; capacité de séquestration du carbone des plantations forestières 2 t E-CO ₂ /ha/an ; mise en œuvre d'un plan de reboisement avec pour objectif de créer 15 000 ha de plantation forestière par an ; protection et conservation des forêts naturelles qui permettrait de réduire et de maintenir le taux de déforestation à 35 000 ha/an.
Potentiels de réchauffement de la planète (GWP)	Selon la Décision 17/CP.8 de la CCNUCC pour la préparation des Inventaires nationaux d'émissions, les valeurs de PRG utilisées sont: PRG CO ₂ = 1, PRG CH ₄ = 21, PRG N ₂ O = 310.
Contribution nette des mécanismes internationaux fondés sur le marché	Aucune contribution des crédits internationaux.

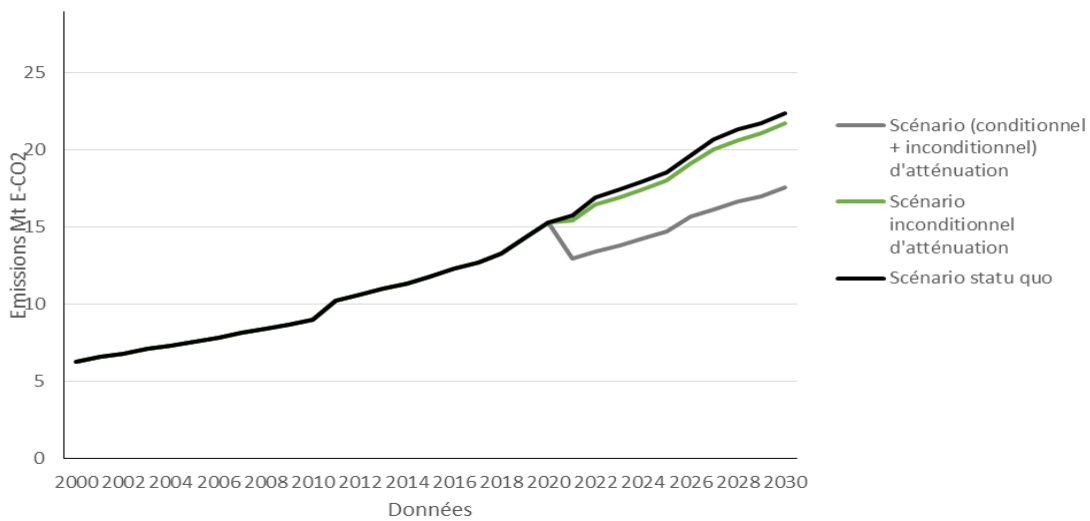


Figure 3 : Estimation des émissions globales des GES en cas du scénario de statu quo et en cas d'intervention.

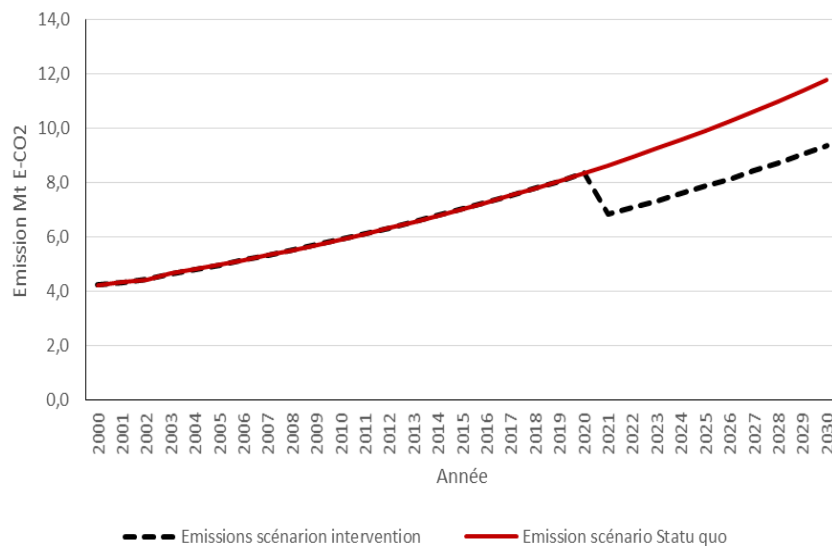


Figure 4 : Estimation des émissions des GES en cas du scénario de statu quo et en cas d'intervention dans le secteur de l'agriculture.

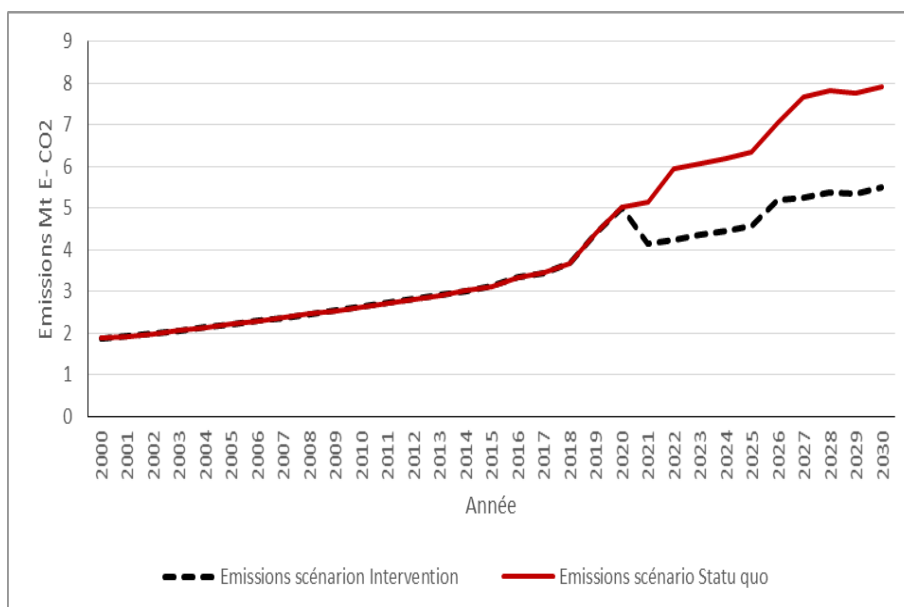


Figure 5 : Estimation des émissions des GES en cas du scénario de statu quo et en cas d'intervention dans le secteur de l'énergie.

III. ADAPTATION

L'adaptation dans le contexte des changements climatiques, se réfère aux initiatives, mesures, actions visant à réduire la vulnérabilité des systèmes naturels et systèmes socio-économiques.

Au Bénin, la prise en compte de l'adaptation dans la CPDN se justifie par le fait qu'elle constitue une priorité nationale au regard du degré de vulnérabilité du pays aux effets néfastes des changements climatiques. En outre, les mesures jusque là mises en œuvre ne concernent que les actions urgentes d'adaptation à court terme et de ce fait ne visent pas les moyen et long termes.

L'objectif global visé par la CPDN du Bénin en matière d'adaptation est d'accroître les efforts pour la réduction de la vulnérabilité aux impacts des Changements Climatiques des systèmes humains, à l'augmentation de la résilience des écosystèmes dans le contexte du réchauffement climatique.

Les travaux réalisés dans le cadre de l'évaluation concertée de la vulnérabilité aux changements climatiques dans les zones géographiques les plus vulnérables du Bénin (PANA, 2008) ont permis d'établir les résultats suivants :

- la sécheresse, les inondations et les pluies tardives et violentes constituent trois risques climatiques majeurs au Bénin ;
- les vents violents et la chaleur excessive sont aussi deux risques climatiques pouvant prendre une grande importance dans certaines localités, dans certaines situations ;
- l'occurrence de risques climatiques localisés, tels que l'élévation du niveau de la mer, ayant une faible emprise géographique, mais capable de grands impacts économiques et sociaux.

Dans les zones agro-écologiques du **centre** et du **nord**, (i) les bassins versants, l'agriculture vivrière et des ressources en eau et (ii) les petits exploitants agricoles, les maraîchers et exploitants agricoles émergents, et les pêcheurs sont fortement exposés aux risques climatiques.

Au niveau des zones agro-écologiques du **sud** (i), l'agriculture vivrière, les terres, les ressources en eau, la santé humaine et la biodiversité, et (ii) les petits exploitants agricoles, les pêcheurs et les éleveurs sont plus exposés aux risques climatiques.

Il est à noter que tous les moyens et modes d'existence sont concernés par les changements climatiques, à des échelles et à des degrés divers. Tous les secteurs clés de la problématique vulnérabilité/adaptation sont en cause : agriculture y compris élevage et pêche, foresterie, ressources en eau, zones côtières, santé humaine, énergie, etc.

Selon la Deuxième Communication Nationale du Bénin sur les Changements Climatiques (DCN, 2011), les tendances observées révèlent que la variabilité interannuelle des pluies au cours de la période 1951-2010, a été caractérisée sur l'ensemble du pays par de courtes périodes déficitaires alternant avec quelques courtes périodes excédentaires. Dans la région méridionale, les plus forts déficits ont été notés presque partout en 1977 et 1983 (années de sécheresse) tandis que les plus forts excédents pluviométriques remontent aux années 1988, 1997 et 2010 (années d'inondation). Au niveau de la région septentrionale, les années 1958, 1977 et 1983 accusent les plus forts déficits pluviométriques tandis que les années 1988 et 1998 enregistrent, dans bon nombre de localités, les plus forts excédents pluviométriques. Quant à la variabilité spatiale, elle reste en général moins marquée ou relativement faible dans les localités sises en dehors du littoral.

En ce qui concerne la température, les écarts par rapport à la moyenne, sont sensiblement de l'ordre de $-0,6^{\circ}\text{C}$ à $+0,8^{\circ}\text{C}$. La configuration des températures moyennes annuelles observées au cours de la période 1961-2010, n'affiche pas une nette tendance à la hausse ou à la baisse.

En somme, si à l'échelle annuelle, l'analyse du climat actuel ne révèle pas de tendances significatives dans les variations des précipitations, par contre l'analyse saisonnière fait apparaître de grandes différences durant la période postérieure à 1971.

Les manifestations des risques climatiques sus indiqués ont engendré au cours des trois dernières décennies de nombreux impacts en l'occurrence la baisse des rendements agricoles, la perturbation des calendriers agricoles, la baisse des niveaux d'eau dans les barrages d'approvisionnement en eau potable, la prolongation de la période d'étiage et la submersion des berges.

Les niveaux de vulnérabilité au plan national, sont en général moyens et parfois élevés.

Quant aux impacts futurs, les horizons temporels 2015, 2025, 2050 et 2100 ont été choisis pour intégrer les effets socioéconomiques et écologiques des changements climatiques (DCN, 2011) au moyen de modèles appropriés. Les projections, indiquent entre autres :

- une élévation continue du niveau de la mer pouvant atteindre environ 0,81m à l'horizon 2100 avec pour effets directs des inondations côtières et l'intrusion d'eaux salines dans les cours et nappes d'eau. Ce qui pourrait affecter les établissements humains, la santé, les activités de pêche ;
- une diminution probable des écoulements des eaux de surface à l'horizon 2050 sur l'ensemble du bassin du fleuve Ouémé dans un scénario de diminution de pluies dans le nord du pays ;
- un décalage des périodes de crue dans la portion béninoise du bassin du Niger, consécutive à une baisse sensible du régime pluviométrique à l'échelle saisonnière ;
- une baisse des rendements du maïs dans certaines zones agro-écologiques ;
- une baisse de la productivité des ressources halieutiques pouvant induire une baisse des prises et une raréfaction des denrées halieutiques au plan national.

En ce qui concerne le niveau de vulnérabilité au plan national, il est élevé notamment pour les systèmes socio-économiques.

Face aux impacts des changements climatiques, des stratégies et programmes d'adaptation aux changements climatiques ont été élaborés tels que le Programme d'Action National aux fins de l'Adaptation aux changements climatiques (PANA), la Stratégie de Développement Sobre en Carbone et Résilient aux Changements Climatiques en cours d'élaboration ainsi que le processus d'élaboration du Plan National d'Adaptation (PNA).

Les principaux objectifs visés concernent la réduction de la vulnérabilité des systèmes socio-économiques et des écosystèmes à la variabilité et aux changements climatiques en adoptant des politiques et mesures appropriées.

Les principales cibles sont les communautés vulnérables des huit zones agro écologiques du pays.

Des initiatives ont été mises en œuvre à travers la sensibilisation du public, le développement et la mise en œuvre de mesures d'adaptation telles que la mise en place de systèmes agro-météorologiques, la promotion des pratiques agricoles résilientes aux changements climatiques, la mise en œuvre du Système d'Alerte Précoce, l'aménagement des bas-fonds ainsi que le développement des capacités de divers acteurs concernés (niveaux national et local), etc.

La mise en œuvre de ces initiatives a bénéficié de l'appui de plusieurs sources de financement dont le Budget national, le Fonds National pour l'Environnement et le Climat (FNEC), les Fonds PMA (LDCF) du Fonds pour l'Environnement Mondial (FEM), le Programme des Nations Unies pour le Développement (PNUD), la coopération allemande, l'Union Economique et Monétaire de l'Ouest Africaine (UMEOA), le Fonds d'Équipement des Nations Unies (FENU), le Centre de Recherche pour le Développement International (CRDI).

Les principaux gaps et barrières en matière d'adaptation concernent principalement l'expertise technique limitée, l'insuffisance et la qualité des données et informations, les réformes institutionnelles inadaptées, l'insuffisance de ressources financières, la quasi-inexistence de textes législatif et réglementaires en matière d'adaptation aux changements climatiques, l'inaccessibilité aux ressources technologiques appropriées, etc.

Au vu des gaps et barrières susmentionnés, les besoins nécessaires à la mise en œuvre des activités d'adaptation, tous secteurs confondus, concernent principalement le renforcement de l'expertise technique sur les méthodologies et outils d'évaluation des impacts et de la Vulnérabilité ainsi que la formulation des réponses adaptatives, l'amélioration des capacités institutionnelles, les besoins technologiques (système de surveillance et de prévision du climat, technologies appropriées d'adaptation dans divers secteurs socio-économiques, etc.), et les ressources financières. Les principales stratégies ainsi que les plans/programmes adoptés par le Bénin en vue de réduire sa vulnérabilité dans le cadre de la CPDN sont consignés dans le tableau 2 en annexe.

En matière de suivi et de notification, une liste d'indicateurs sera établie et un mécanisme de suivi sera mis en place et permettra de renseigner périodiquement ces indicateurs et d'évaluer les progrès accomplis dans l'atteinte des objectifs en matière d'adaptation. Le processus PNA offre l'opportunité de concrétiser les éléments de suivi et d'évaluation.

IV. AMBITION ET ÉQUITÉ

La République du Bénin fait partie des pays les moins avancés (PMA) dont les émissions de GES sont estimées à environ 1 t E-CO₂ par habitant en 2000 et largement compensées par la séquestration du carbone au niveau du couvert forestier national. Ses émissions sont donc insignifiantes par rapport aux émissions globales. Malgré cette responsabilité très négligeable dans le réchauffement climatique et sa situation de PMA, le Bénin s'est doté d'un programme de gestion des changements climatiques incluant toutes les actions d'intervention dans le domaine de la gestion des changements climatiques. A travers la mise en œuvre de sa contribution, le Bénin renforcera son potentiel de séquestration de carbone au niveau du couvert forestier national pendant que ses émissions cumulées régresseront par rapport à l'année de référence d'ici à 2030. Un effort est en cours pour lutter contre la pollution atmosphérique à travers l'amélioration de la fluidité du trafic (construction d'ouvrages spécifiques de type échangeurs aux grands carrefours, aménagement de pistes cyclables, aménagement des voies piétonnes) notamment dans la ville de Cotonou, l'exonération fiscale et douanière sur les motocyclettes à 4T et leurs pièces détachées au détriment des motocyclettes à 2T, la réhabilitation et la modernisation du réseau ferroviaire existant pour le développement des transports en commun malgré la pression qu'exercent ces mesures sur son budget. Dans le secteur énergétique, la biomasse-énergie (bois de feu, charbon de bois) est la forme d'énergie la plus consommée au Bénin. Le pays dépend de l'extérieur pour son approvisionnement en énergies commerciales (produits pétroliers et électricité). Les mesures envisagées dans la CPDN, en même temps qu'elles visent le bien-être des populations, sont orientées vers des énergies moins polluantes et l'économie d'énergie notamment l'efficacité énergétique, la production d'électricité à partir des sources d'énergies renouvelables malgré les surcoûts qu'elles engendrent.

V. CADRE INSTITUTIONNEL DE MISE EN ŒUVRE

La contribution du Bénin sera mise en œuvre sous l'égide du Ministère en charge des Changements Climatiques qui assure le rôle de Point Focal National de la Convention-Cadre des Nations Unies sur les Changements

Climatiques avec la participation effective de toutes les parties prenantes (Ministères sectoriels, collectivités locales, secteur privé, société civile, etc.)

Le Comité National sur les Changements Climatiques (CNCC) et la Commission de Modélisation Economique des Impacts du Climat et de l'Intégration des Changements Climatiques dans le Budget Général de l'Etat (CMEICB) constituent des organes d'aide à la décision et du suivi de la mise en œuvre de la CPDN.

Le Bénin dans son Programme National de Gestion des Changements Climatiques a développé un niveau d'organisation de suivi-évaluation de la vulnérabilité et de l'adaptation aux changements climatiques visant à doter le programme d'un comité de pilotages national (CNCC), d'un comité départemental et communal d'orientation et des commissions techniques intersectorielles, permettant de donner des orientations générales, d'assurer le suivi de la vulnérabilité climatiques et les actions en matière d'adaptations/atténuation aux changements climatiques.

VI. MOYENS DE MISE EN ŒUVRE

Les activités prévues dans le cadre de la mise en œuvre de la CPDN du Bénin requièrent des moyens financiers, technologiques et de renforcement des capacités.

6.1- Besoins en Transfert de Technologies :

En ce qui concerne les ressources technologiques, l'accent sera mis sur les technologies endogènes et le transfert Sud-Sud et Nord-Sud y compris le savoir-faire nécessaire. Les principaux besoins en transferts de technologies identifiés concernent les secteurs de l'agriculture/foresterie, de l'énergie, des déchets et du transport (tableau 3).

Tableau 3 : Besoins en transfert de technologies.

Secteur énergie	Secteur agriculture/foresterie	Secteur déchet	Secteur transport
<ul style="list-style-type: none"> - Moteur de véhicule et de groupe électrogène à basse consommation - Foyer économique et autocuiseur performant - Gaz butane et équipements associés ; - Promotion des énergies renouvelables - Promotion de l'efficacité énergétique (secteur résidentiel et industriel) 	<ul style="list-style-type: none"> - Agroforesterie - Production de biogaz - Densification des résidus et déchets agricoles en briquettes - Variétés de culture à cycle court et moins exigeantes en eau - Compostage par tas - Pratique carbonisation améliorée (meule Casamance) - Gestion durable des forêts 	<ul style="list-style-type: none"> - Gestion écologiquement rationnelle des déchets par filière - Technique de traitement CALCIOR - Technique de valorisation des déchets par procédé ECOSAN 	<ul style="list-style-type: none"> Promotion de transport en commun et des véhicules propres

6.2- Renforcement de capacités :

Le renforcement des capacités consistera au développement des compétences et de l'amélioration des capacités institutionnelles (tableau 4).

Tableau 4 : Besoins en renforcement des capacités.

Secteurs/domaines prioritaires	Besoins en renforcement des capacités
Système d'Observation et de surveillance du climat	Mise en place d'un système d'observations et de surveillance du climat fiable sur l'ensemble du système climatique, notamment les composantes Terre, Océan et Atmosphère.
	Renforcement des stations de mesures de la pollution atmosphérique.
	Mise en place des capacités de surveillance et de prévision des fluctuations et des changements atmosphériques, des systèmes d'alerte précoce et d'évaluation des impacts socio-économiques, environnementaux, etc.
Cadre institutionnel	<p>Renforcement des structures actuelles qui opèrent dans le domaine de la protection de l'atmosphère.</p> <p>Création ou renforcement des structures s'occupant des questions relatives à l'adaptation.</p> <p>Création ou renforcement des structures s'occupant des questions de l'atténuation.</p> <p>Définition des plans nationaux climats et renforcement de la prise en compte des changements climatiques dans les programmes/ stratégie de développement .</p>
Agriculture	Création de cellules de gestion de risques et crises agro-climatiques et mise en place d'un comité de coordination et de suivi de la mise en œuvre de la CCNUC dans le secteur agricole.
	Intégration des questions relatives aux Changements Climatiques dans les politiques, plans et programmes de développement agricole.
	Formation des agents de développement rural sur la problématique des relations climat – agriculture.
	Formation des acteurs (techniciens, paysans, autorités locales) par le truchement de la conception de projets de développement orientés sur les relations climat – agriculture.
	Développement de technologies (pratiques agricoles, semences ou variétés culturales adaptées au contexte de climat modifié, biotechnologie agricole, techniques d'irrigation et d'économie de l'eau, appropriation des dispositifs de mise en œuvre des systèmes d'alerte rapide en situation de crises).
	Utilisation des modèles en agro-climatologie (renforcement des capacités en modélisation des risques agro-climatiques, familiarisation aux logiciels DSSAT, SARRAH, etc.).
	<p>Vulgarisation des savoirs locaux en matière de gestion des risques ou crises agro-climatiques.</p> <p>Suivi-évaluation des projets de développement agricoles et hydro-agricoles.</p>
Energie	Promotion et amélioration de l'accès aux sources d'énergies renouvelables aux fins de sauvegarder les ressources forestières et de réduire la vulnérabilité des populations aux effets induits par les Changements Climatiques.
	Renforcement des capacités sur les initiatives et les mesures d'économie d'énergie dans le secteur domestique.
	Adoption de labels et normes pour les lampes efficaces et les climatiseurs.
Ressources en eau	Renforcement des aptitudes des services décentralisés de la Direction Générale de l'Eau à prévoir les risques et à gérer les crises hydro-climatiques.
	Renforcement des capacités en matière de prise en compte des questions relatives aux Changements Climatiques dans les politiques de gestion des ressources en eau.
	Formation des cadres techniques dans le domaine de la vulnérabilité des systèmes hydriques aux Changements Climatiques et sur la méthodologie d'étude de la

Secteurs/domaines prioritaires	Besoins en renforcement des capacités
	<p>vulnérabilité des ressources en eau aux Changements Climatiques.</p> <p>Elaboration de projets de gestion intégrée des ressources en eau en condition de Changements Climatiques.</p> <p>Modélisation hydro climatique (fonctionnement hydrologique des bassins versants, fonctionnement hydrogéologique des aquifères, processus d'intrusion saline dans les champs de captage dans la zone côtière).</p>
Biodiversité	<p>Mise en place de cellules chargées des questions de Changements Climatiques dans leur relation avec la biodiversité.</p> <p>Prise en compte de la problématique des Changements Climatiques dans la gestion des ressources biologiques.</p> <p>Formation des acteurs (décideurs, techniciens, paysans, autorités locales) en élaboration de projets intégrés de conservation des ressources biologiques en situation de climat modifié et en méthodologie de conservation ex situ et in situ.</p> <p>Vulgarisation des savoirs locaux en matière de gestion des ressources biologiques.</p> <p>Mise en place des systèmes d'information et d'alertes sur les effets néfastes des Changements Climatiques sur la biodiversité</p> <p>Valorisation des connaissances traditionnelles en matière de relation climat - diversité biologique.</p> <p>Elaboration et diffusion en langues locales des textes de lois et règlements relatifs à la gestion de la biodiversité.</p> <p>Valorisation des connaissances traditionnelles en matière de diversité biologique pour le renforcement des puits de séquestration du carbone.</p>
Etablissements humains	<p>Intégration des questions de Changements Climatiques dans les plans stratégiques de développement humain.</p> <p>Formation et information des acteurs (décideurs, agents de santé, populations, autorités locales) sur les effets néfastes des Changements Climatiques sur les établissements humains.</p> <p>Protection des systèmes socio-économiques contre la dégradation de l'environnement côtier et l'élévation du niveau marin.</p> <p>Elaboration participative et suivi-évaluation de projets de développement humain intégrant les questions de Changements Climatiques.</p> <p>Renforcement des capacités, à différents échelons, pour interpréter et communiquer les informations climatiques pertinentes et conseiller les communautés locales.</p> <p>Renforcement des capacités institutionnelles et techniques de l'Administration, des organisations de la société civile et des communautés, pour l'évaluation des risques et des vulnérabilités locales, et la formulation de plans et politiques de développement sensibles au climat.</p> <p>Promotion de solutions d'adaptation pratiques à la variabilité du climat et aux risques futurs de changement climatique.</p> <p>Promotion du renforcement et du partage de connaissance sur le changement climatique, par des activités de sensibilisation, de gestion des risques et d'élaboration de</p>

Secteurs/domaines prioritaires	Besoins en renforcement des capacités
	politiques sensibles au genre.
Santé	Formation des acteurs de la pyramide sanitaire sur les changements climatiques et leurs impacts sur la santé.
	Mise en place d'un système de surveillance et d'information sur l'impact des changements climatiques sur la santé.
Déchets	Gestion écologiquement rationnelle des déchets par filière

6-3- Financement :

L'appui financier extérieur (bilatéral ou multilatéral) sera complété par les ressources du Budget National.

Le coût total estimatif pour l'exécution des plans, programmes et projets inscrits au titre de la CPDN du Bénin s'élève globalement à 30,13 milliards de dollars US dont 2,32 milliards de dollars US en option inconditionnelle et 27,81 milliards de dollars US en option conditionnelle. Les parts qui reviennent aux mesures d'atténuation et d'adaptation sont respectivement de 12,13 et de 18 milliards de dollar US. Cette estimation est basée sur les expériences actuelles du pays dans la mise en œuvre des projets d'atténuation et d'adaptation aux changements climatiques.

Afin de mesurer les progrès accomplis dans la mise en œuvre desdites activités, des systèmes de suivi-évaluation seront mis en place. Le système (Mesure, Notification et Vérification) sera d'une utilité certaine à cet égard.

ANNEXES

Annexe 1

Tableau 1 : Synthèse des mesures d'atténuation au titre des contributions prévues déterminées au niveau national

Stratégies sectorielles	Objectifs de la mesure proposée	Objectif quantifié (horizon 2030)	Options et couts				
			Inconditionnelle *	Coût total en milliards US	Conditionnelle *	Coût en milliards US	Coût en milliards \$
Secteur Energie	Promouvoir l'éclairage public solaire photovoltaïque dans les milieux ruraux et périurbains ;	1000000 de lampes et torches solaires dans les ménagers	100%	0,151	0%	0	0,151
	Promouvoir la construction des centrales solaires	construction de centrales solaires 40 MW	50 %	0,04	50%	0,04	0,08
	Accroître la production hydroélectrique	construction de barrages hydroélectrique 259,9 MW	0	0	100%	0,892	0,892
		Electrification des localités (objectif global : 1000 localités)	30%	0,105	70%	0,245	0,35
		Promotion de l'accès des ménages aux lampes à basse consommation d'énergie (objectif : 1 200 000 lampes)	33,33	0,00096	66,67	0,00192	0,00288
		Appui l'acquisition de par la SBEE de 200 000 kits de branchement des ménages	0	0	100%	0,044	0,044

Promouvoir l'accès des ménages aux équipements de cuisson à gaz butane ;	275 000 ménages et subvention à 35% des recharges de gaz	0,63	0,00125	99,36%	0,197	0,19825
Accroître la production d'électricité à partir du gaz naturel	construction de centrale fioul/gaz (400MW)	42,82%	0,145	57,18	0,1936	0,3386
Construire au port de Cotonou une unité de stockage et de regazéification de gaz naturel liquéfié + pipeline de raccordement au gazoduc	unité de stockage et de regazéification du gaz	0%	0	100%	0,33	0,33
Promouvoir les foyers économiques.	140 000 foyers améliorés	28,73%	0,000125	71,27%	0,00031	0,000435
Promouvoir les fours de carbonisation à haut rendement	-	0%	0	100%	0,0048	0,0048
Créer des plantations de bois-énergie.	5000 ha	1%	0,01	99%	0,99	1
Développer un système de transport fluvio-lagunaire sur les plans et cours d'eau navigables du Bénin ;	les cinq (5) communes lacustre/riveraines du lac Nokoue	0%	0	100%	0,002	0,002
Développer le transport en commun intra et inter- urbain	Cotonou, Porto-Novo et Parakou	0%	0	100%	2,7853	2,7853
Instaurer la taxation différentielle en faveur des véhicules d'occasion âgés d'au plus cinq (05) ans ;		100%	0,001	0%	0	0,001
Instaurer l'exonération des droits d'impôts sur les véhicules de transport en commun		100%	0,001	0%	0	0,001
	-					

	Poursuivre la promotion des vélomoteurs quatre temps 4T au détriment des vélomoteurs 2T (l'exonération fiscale et douanière sur les motocyclettes à 4T et leurs pièces détachées) ;	-	100%	0,001	0%	0	0,001
secteur forestier	Promouvoir les plantations domaniales, communales et privées	superficie de 100 000 ha	8%	0,08	92%	0,92	1
	Restaurer les forêts naturelles dégradées	532 961 ha	2,56%	0,02	97,44%	0,76	0,78
	Rationaliser l'exploitation des ressources forestières	sur une étendue d'au moins 1 330 000 ha ;	3,84%	0,01	96,16%	0,25	0,26
	Sécuriser les limites des domaines forestier de l'Etat ;	2 664 805 ha	8,57%	0,03	91,43%	0,32	0,35
	Promouvoir les activités alternatives à l'exploitation des ressources forestières.	Au plan national-	4,65%	0,02	95.35%	0,41	0,43
Secteur Agriculture	Promouvoir les engrais spécifiques et autres intrants organiques biologiques pour une gestion durable de la fertilité des sols.	Les grandes zones agricoles	0%	0	100%	0,23755	0,23755
Secteur déchet et assainissement	Elaborer et mettre en œuvre des plans directeurs d'assainissement ;	Toutes les municipalités	100%	0,001	0%	0,216	0,217
	Promouvoir la gestion des déchets axés sur un accroissement de la capacité de valorisation par filière biodégradable et non biodégradable ;	Toutes les municipalités	0%	0	100%	0,488372	0,488372
	Optimiser les systèmes de collecte de déchets ;	Toutes les municipalités	100%	0,04712	0%	0	0,04712

	Mettre en place un système de gestion décentralisé des déchets par filière au plan national.	Toutes les municipalités	0%	0	100%	0,15	0,15
	Doter les municipalités du Bénin de décharges contrôlées ;	77 communes	33,33%	0,02	66,67%	0,04	0,06
	Limiter les impacts négatifs des déchets solides sur l'environnement dans les municipalités ;	Toutes municipalités	25%	0,002	75%	0,006	0,008
	Améliorer les capacités techniques et la gestion des ONG de pré-collecte	Au plan national	0%	0	100%	0,06	0,06
	Augmenter le taux de pré-collecte et de collecte dans les municipalités (actuellement allant de 2 à 30 % dans certaines municipalités à environ 60 % d'ici à 2030)	Toutes les municipalités	100%	0,02	0%	0	0,02
Cadre institutionnel et réglementaire	Promouvoir des systèmes de production résilients aux changements climatiques		0%	0	100%	0,06	0,06
	Faire acquérir aux populations les connaissances, les valeurs, les comportements et les compétences pratiques nécessaires en matière d'atténuation et d'adaptation aux changements climatiques ;		2,44%	0,01	97,56%	0,4	0,41
	Protéger les écosystèmes et les établissements humains contre les risques liés aux changements climatiques ;		0%	0	100%	0,7	0,7

	Contribuer à la prévention et à la gestion des risques de catastrophes naturels au plan national;		50%	0,07	50%	0,07	0,14
	Renforcer le cadre institutionnel et réglementaire du sous-secteur Gestion des Changements Climatiques ;		100%	0,009	0%	0	0,009
	Promouvoir la recherche scientifique, technique et technologique en matière d'adaptation et d'atténuation aux changements climatiques;		0%	0	100%	0,423256	0,423256
	Promouvoir le transfert de technologie et savoir-faire en matière d'adaptation et d'atténuation aux changements climatiques.		0%	0	100%	0,1	0,1
TOTAL			33,79	0,795455	66,21	11,337108	12,132563

ANNEXE 2

Tableau 2 : Synthèse des mesures d'adaptation au titre des contributions prévues déterminées au niveau national

N°	Stratégies/Plans/Programmes d'Adaptation aux Changements Climatiques	Objectifs	Observations/état de mise en œuvre	Options et coûts				
				Inconditionnelle	Coût en milliards \$	Conditionnelle	Coût en milliards \$	Coût en milliards \$
I	Renforcement du système de prévision de risques climatiques et d'alerte rapide pour la sécurité alimentaire dans les zones agro-écologiques vulnérables	<p>Mettre à la disposition des acteurs et des communautés agricoles des avis et des alertes en cas d'événements météorologiques et climatologiques significatifs annoncés, dommageables aux systèmes de production</p> <p>-Promouvoir les systèmes appropriés de production agricole d'adaptation aux changements climatiques pour la sécurité alimentaire et nutritionnelle</p> <p>-Mettre au point de nouveaux calendriers agricoles permettant aux acteurs de l'économie agricole et pastorale de planifier et d'exécuter des opérations de production avec une bonne sécurité</p> <p>- Contribuer à la sécurité alimentaire et à une croissance économique forte et inclusive au Bénin</p>	<p>- Programme intégré d'adaptation aux changements climatiques dans le secteur agricole dans 4 zones agro-écologiques vulnérables (2011-2015). Une mise à échelle est envisagée.</p> <p>- Programme Intégré d'Adaptation aux Changements Climatiques par le Développement de l'Agriculture, du Transport fluvial, du Tourisme, dans la vallée du Niger au Bénin (PIACC-DAT-Vallée du Niger au Bénin) non encore mis en œuvre</p> <p>- Projet d'adaptation des calendriers agricoles au nouveau contexte des changements climatiques non encore mis en œuvre</p> <p>- Projet d'Appui aux Infrastructures dans la Vallée de l'Ouémé (PAIA-VO) en cours de mise en œuvre (2013-2020)</p> <p>- Projet de Développement d'Infrastructures Socio-économiques et de Sécurité Alimentaire (PDISSA) (Aménager 750 ha de périmètres irrigués dans le bassin du Niger) non encore mis en œuvre</p>	09,52%	1,0	90,48%	9,5	10,5

2	Mobilisation des eaux de surfaces aux fins d'adaptation aux changements climatiques (micro-barrages)	Renforcer la disponibilité de l'eau pendant les périodes sèches aux fins d'adaptation des populations aux changements climatiques ; Promouvoir la gestion intégrée des ressources en eau	Mesure identifiée dans PANA, 2008 et DCN, 2011 - Plan d'action national de gestion intégrée des ressources en eau (PANGIRE) (2011-2015) en cours d'actualisation - Schéma Directeur d'Aménagement et de Gestion des Eaux du Bassin de l'Ouémé (2013-2025)	11,11%	0,35	88,89%	2,80	3,15
3	Réduction de la vulnérabilité des femmes enceintes et des enfants de moins de cinq ans face aux maladies liées aux risques climatiques au Bénin	Contribuer à la réduction de la morbidité et la mortalité dues au paludisme et autres maladies liées aux risques climatiques au Bénin.	Mesure identifiée au titre du PANA mais non encore mis en œuvre	2,08%	0,05	97,92%	2,35	2,40
4	Protection de la zone côtière face à l'élévation du niveau de la mer/érosion côtière.	- Corriger le déséquilibre sédimentaire, le démaigrissement et le recul de la plage, - Restaurer les écosystèmes fragiles (mangrove) et promouvoir une technologie améliorée d'extraction du sel combinant l'énergie solaire et le vent.	Mesure identifiée au titre du PANA mais non encore mise en œuvre - Projet de protection de la côte à l'Est de Cotonou (2009-2015) - Projet de protection de la côte entre Hilacondji et Grand Popo (2012-2018)	21,05	0,04	78,95%	0,46	0,5
5	Renforcement de la gouvernance locale en matière de financement de l'adaptation aux changements climatiques	Contribuer à combler le déficit de financement de l'adaptation aux changements climatiques au niveau des collectivités locales tout en développant leur capacité institutionnelle et technique pour faire face aux risques et défis climatiques dans le processus de développement local.	Un projet pilote est en cours de mise en œuvre dans 03 communes sur les 77 que compte le pays(2014-2016). Il y a donc nécessité de l'étendre aux 77 autres communes.	07,32%	0,03	92,68%	0,38	0,45

6	Renforcement des capacités en matière d'observation du climat	renforcer les capacités de suivi, les systèmes d'alerte précoce et la disponibilité d'informations en matière de changements climatiques pour faire face aux chocs climatiques et planifier l'adaptation aux changements climatiques au Bénin	<p>- Projet de renforcement de l'Information sur le climat et système d'alerte précoce en Afrique pour un développement résilient au climat et adaptation aux changements climatiques (SAP-Bénin) en cours de mise en œuvre (2013-2017)</p> <p>- Projet de renforcement du système d'observation aux fins d'une meilleure surveillance du climat et de sa variabilité dans la portion nationale du fleuve Niger non encore mis en œuvre</p>	03,70%	0,05	96,30%	1,30	1,35
	Total			8,44%	1,52	91,56	16,83	18,35



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དཔལ་ལྷན་འབྲུག་གཞུང་།
National Environment Commission
Royal Government of Bhutan



NEC/CC/FCCC/2015/ 706

30 September 2015

Ms. Christiana Figueres
Executive Secretary
UN Climate Change Secretariat
Bonn
Germany

Sub: Communication of INDC of the Kingdom of Bhutan

Excellency,

I have the honour to communicate the intended nationally determined contribution of the Kingdom of Bhutan.

Bhutan's INDC builds on the declaration to remain carbon neutral made in 2009 and as a highly vulnerable landlocked mountainous least developed country, an adaptation component is also included in our INDC.

Bhutan remains committed to the ideals and missions of the UNFCCC and the negotiations process to adopt a legally binding agreement at the twenty first session of the conference of parties in December 2015.

Please accept, Excellency, the assurance of my highest consideration.

Yours sincerely,


Yeshey Dorji
Vice Chair of National Environment Commission
Minister for Agriculture and Forests

Attachment: INDC of the Kingdom of Bhutan (8 pages)

Kingdom of Bhutan

Intended Nationally Determined Contribution

Introduction

The Kingdom of Bhutan is committed to a successful conclusion of negotiations under the Adhoc-Working Group on the Durban Platform for Enhanced Action (ADP) to adopt a new legally binding agreement under the UNFCCC to be implemented from 2020. In accordance with relevant paragraphs of Decisions 1/CP.19 and 1/CP.20 the Kingdom of Bhutan communicate its Intended Nationally Determined Contribution (INDC) and re-communicates our resolve to remain carbon neutral by ensuring that our emission of GHGs does not exceed the sink capacity of our forests.

The Kingdom of Bhutan made the commitment to remain carbon neutral in 2009¹ despite our status as a small, mountainous developing country with many other pressing social and economic development needs and priorities. This commitment was made with the view that there is no need greater, or more important, than keeping the planet safe for life to continue. While making this sincere commitment to remain carbon neutral, we also called on the global community to support our resolve and efforts to fulfil this commitment and support us to undertake appropriate mitigation and adaptation measures.

As a land-locked least developed country located in a fragile mountainous environment, Bhutan remains highly vulnerable to the impacts of climate change and will disproportionately bear the impacts of climate change. Therefore an adaptation component is also included in the INDC from Bhutan.

Considering the historical and current emissions from Bhutan and our imperatives for sustainable development, Bhutan's INDC is most ambitious and more than our fair share of efforts to combat climate change. Therefore, in putting forward this INDC, we once again call on the international community to support our efforts to mitigate and adapt to climate change.

National Context

The Kingdom of Bhutan is a small landlocked and least developed country with a total area of 38,394 sqkm and is characterized by rugged mountainous terrain with elevations ranging from around 160 meters to more than 7000 meters above sea level. The population is projected to be around 745,000 with 56.3% of the total engaged in agriculture and forestry².

¹ Declaration of the Kingdom of Bhutan - the Land of Gross National Happiness to Save our Planet, dated 11 December 2009.

² Statistical Yearbook of Bhutan 2014, NSB

Export of electricity from hydropower projects form a major source of revenue for the government and development activities³.

According to the second national GHG inventory, Bhutan is a net sink for greenhouse gases. The estimated sequestration capacity of our forest is 6.3 million tons of CO₂ while the emissions for year 2000 is only 1.6 million tons of CO₂ equivalent. This is largely due to huge areas of forest cover, low levels of industrial activity and almost 100% electricity generation through hydropower.

Although the highest emissions are from the agriculture sector they have more or less remained constant, but emissions from sectors such as industrial processes and transport are showing a rapidly increasing trend⁴. During the period 2000-2013, emissions from the energy sector increased by 191.6% from 0.270 million tons of CO₂e in 2000 to 0.79million tons of CO₂e in 2013. During the same period, emissions from industrial processes increased by 154.3% from 0.24 million tons of CO₂e to 0.6 million tons of CO₂e. Emission from waste management also increased by 247.54% from 0.047 million tons of CO₂e to 0.16 million tons CO₂e.

Forests currently cover 70.46%⁵ of the land area of Bhutan and sequestration by forests is estimated⁶ at 6.3 million tons of CO₂ and emissions in 2013 are estimated at 2.2 million tons of CO₂ equivalent⁷.

As reported in the Second National Communication, Bhutan is highly vulnerable to adverse impacts of climate change due to the fragile mountainous ecosystem and economic structure. The most vulnerable sectors are water resources, agriculture, forests & biodiversity and hydropower sectors. It is projected that both the frequency and intensity of extreme climate events would increase with changing climate.

Major existing laws and policies applicable to the INDC from Bhutan include the Constitution of the Kingdom of Bhutan, National Environment Protection Act (NEPA) 2007, National Forest Policy 2011, and Economic Development Policy (EDP) 2010.

Mitigation

Bhutan intends to remain carbon neutral where emission of greenhouse gases will not exceed carbon sequestration by our forests, which is estimated at 6.3 million tons of CO₂. Bhutan will maintain a minimum of 60 percent of total land under forest cover for all time in accordance the Constitution of the Kingdom of Bhutan. Efforts will also be made to maintain current levels of forest cover, which currently stand at 70.46%, through sustainable forest management and conservation of environmental services.

³ National Accounts Statistics 2014, NSB

⁴ Second National Communication from Bhutan to UNFCCC, 2011

⁵ Land Cover Mapping Project, 2010, NSSC

⁶ Second National Communication from Bhutan to UNFCCC, 2011

⁷ Unpublished estimates by NECS, RGOB 2015

Hydropower from run-of-the-river schemes account for almost 100% of electricity generation in Bhutan with almost 100% access to electricity in urban areas and 94% in rural areas. Presently, Bhutan offsets 4.4 million tons of CO₂e through exports of hydroelectricity. In addition, Bhutan can offset up to 22.4 million tons of CO₂e per year by 2025 in the region through the export of electricity from our clean hydropower projects.

Various other policies and initiatives are also already in place that contribute to mitigation such as sustainable land management practices, improved livestock management, promotion of organic agriculture and promotion of zero emission vehicles. The Economic Development Policy of 2010 and draft of 2015 also provide several measures to promote “green growth” for industrial development. The present five year development plan (2013-18) has also integrated carbon neutral development as part of the national key result areas to guide planning and implementation of development activities within all sectors.

As a least-developed country, Bhutan has a development imperative and will pursue ecologically balanced sustainable development in line with our development philosophy of Gross National Happiness. To remain carbon neutral, growing emissions from economic development will need to be mitigated by pursuing low emission development pathways across all sectors. However international support will be essential to ensure success in implementing the strategies, plans and actions for low GHG development.

Strategies, plans and actions for low GHG emission development

While the basis of our mitigation efforts rests on conserving our forests as carbon sinks, managing the growing emissions as a result of economic development will be through priority strategies, plans and actions for mitigation to support a low emission development pathway. These plans and priority actions, listed below, are based on the National Environment Protection Act, National Strategy and Action Plan for Low Carbon Development (2012), Economic Development Policy (2010 and draft 2015), Bhutan Transport 2040: Integrated Strategic Vision, National Forest Policy, and other sectoral plans and strategies.

The gases covered include carbon dioxide, methane and nitrous oxide as they were shown to be the priority gases in our second national communication.

1. Sustainable forest management and conservation of biodiversity to ensure sustained environmental services through:
 - Sustainable management of forest management units (FMUs), protected areas, community forests, forest areas outside FMUs, and private forests
 - Enhancing forest information and monitoring infrastructure through national forest inventories and carbon stock assessments
 - Forest fire management and rehabilitation of degraded and barren forest lands
2. Promotion of low carbon transport system by:
 - Improving mass transit and demand side management of personal modes of transport

- Exploring alternative modes of transport to road transport such as rail, water and gravity ropeways
 - Improving efficiency in freight transport
 - Promoting non-motorized transport and non-fossil fuel powered transport such as electric and fuel cell vehicles
 - Improving efficiency and emissions from existing vehicles through standards and capacity building
 - Promoting use of appropriate intelligent transport systems
3. Minimize GHG emission through application of zero waste concept and sustainable waste management practices:
 - Enhancement of the three R principles including the conversion of waste to resources
 - Improving the current system and infrastructure for waste management
 4. Promote a green and self reliant economy towards carbon neutral and sustainable development through:
 - Improvement of manufacturing processes in existing industries through investments and adoption of cleaner technology, energy efficiency and environmental management
 - Enhance and strengthen environmental compliance monitoring system
 - Promote investment in new industries that are at higher levels in the value chain, and green industries and services.
 - Promote industrial estate development and management in line with efficient, clean and green industry development objectives
 5. Promote clean renewable energy generation:
 - Pursue sustainable and clean hydropower development with support from CDM or other climate market mechanisms to reduce emissions within Bhutan and the region by exporting surplus electricity
 6. Promote climate smart livestock farming practices to contribute towards poverty alleviation and self sufficiency through:
 - Organic livestock farming and eco-friendly farm designs
 - Improvement of livestock breeds, including conservation of native genetic gene pool/diversity
 - Expansion of biogas production with stall feeding
 - Agro-forestry or agro-silvo pastoral systems for fodder production
 7. Promote climate smart agriculture to contribute towards achieving food and nutrition security through:
 - Organic farming and conservation agriculture
 - Development and promotion of sustainable agricultural practices
 - Integration of sustainable soil and land management technologies and approaches

8. Energy demand side management by promoting energy efficiency in appliances, buildings and industrial processes and technologies.
9. Integration of low emission strategies in urban and rural settlements through green buildings, sustainable construction methods and climate smart cities.

Adaptation

Adaptation to the adverse impacts of climate change is a priority for Bhutan. In addition to being a land locked and least developed country with a fragile mountainous environment, Bhutan is further threatened by climate change due to the high dependence of the population on agriculture and the significant role of hydropower for economic development. Bhutan also faces increasing threats from climate hazards and extreme events such as flash floods, glacial lake outburst floods (GLOF), windstorms, forest fires and landslides.

Despite following a cautious approach to development by balancing the need for environmental conservation and economic development, climate change threatens to derail the substantial gains made by Bhutan towards sustainable socio-economic development. Therefore, international support is essential to address the adverse impacts of climate change that are already starting to take place in Bhutan and also to safeguard the gains made towards sustainable development.

Bhutan prepared its National Adaptation Program of Action (NAPA) in 2006 and also updated the project profiles (2012) and is now implementing few of the priority actions identified as urgent and immediate needs. For the medium to long term, Bhutan views the process to formulate and implement National Adaptation Plans (NAPs) as an important means towards reducing vulnerability by both integrating climate change adaptation into national development planning and also implementing priority adaptation actions on the ground. Bhutan will be fully engaged in the NAP process and begin the formulation of the first NAP once support is received.

Based on the information presently available through the NAPA, the vulnerability and adaptation assessment in the Second National Communication and other plans and programs in sectors, priority adaptation actions are foreseen in key sectors and areas as follows:

Priority adaptation needs

1. Increase resilience to the impacts of climate change on water security through Integrated Water Resource Management (IWRM) approaches including:
 - Water resources monitoring, assessment, and mapping
 - Adoption and diffusion of appropriate technologies for water harvesting and efficient use
 - Climate proofing water distribution systems
 - Integrated watershed and wetland management

2. Promote climate resilient agriculture to contribute towards achieving food and nutrition security through:
 - Developing and introducing climate resilient crop varieties and conservation of plant genetic resources
 - Developing and institutionalising surveillance of crop pests and diseases
 - Enhancement of national capacity to develop and implement emergency response to agricultural pest and disease outbreaks/epidemics
 - Establishment of cold storage facilities at sub-national regions
 - Improving and increasing investment in irrigation systems and management
 - Initiating crop insurance programs against climate induced extremes
 - Promotion of sustainable soil and land management technologies and approaches
3. Sustainable forest management and conservation of biodiversity to ensure sustained environmental services through:
 - Sustainable management of forest management units (FMUs), protected areas, community forests, forest areas outside FMUs, and private forests
4. Strengthen resilience to climate change induced hazards through:
 - Improved monitoring and detection of hydromet extremes using remote sensing and satellite-based technologies and approaches
 - Continual assessment of potentially dangerous glacial lakes and improvement of early warning system for GLOFs
 - Develop a monitoring, assessment, and warning systems for flash flood and landslide hazards and risks
 - Forest fire risk assessment and management
 - Assessment and management of risk and damage from windstorms on agricultural crops and human settlements.
 - Enhancement of emergency medical services and public health management to respond to climate change induced disasters
 - Enhancing preparedness and response to climate change induced disasters at the national and local levels
5. Minimize climate-related health risks through:
 - Strengthening integrated risk monitoring and early warning systems and response for climate sensitive diseases
 - Promotion of climate resilient household water supply and sanitation
6. Climate proof transport infrastructure against landslides and flash floods, particularly for critical roads, bridges, tunnel and trails
7. Promote climate resilient livestock farming practices to contribute towards poverty alleviation and self sufficiency through:
 - Climate change resilient farm designs and practices
 - Livestock insurance against climate induced extremes

8. Enhancing climate information services for vulnerability and adaptation assessment and planning through:
 - Improvement of hydro meteorological network and weather and flood forecasting to adequate levels of temporal and spatial scales
 - Development of climate change scenarios for Bhutan with appropriate resolution for mountainous situation
9. Promote clean renewable and climate resilient energy generation by:
 - Diversifying energy supply mix through promotion of renewable energy (solar, wind, small hydro, biomass) other than large hydro and creating investment opportunities
 - Ensuring energy security during the lean dry season through water storage and reservoirs
 - Protecting catchment areas for hydropower through watershed and sustainable land management approaches
10. Integrate climate resilient and low emission strategies in urban and rural settlements through:
 - Promotion of climate smart cities
 - Improvement of storm water management and sewer systems
 - Environmental management and safeguards of development activities

Means of Implementation

As the vast forest sink of Bhutan will form the cornerstone of our commitment to remain carbon neutral, measures to manage and conserve the forests will need to be supported by a robust forest monitoring system. The first comprehensive national forest inventory presently underway will provide an updated state of the forests in Bhutan by end of 2016. The forest monitoring and inventory system being developed in conjunction with a national forest monitoring system for REDD+ will enable monitoring and assessment of forest cover over time.

Mitigation measures to manage and reduce emissions in priority areas and sectors will need to be implemented through relevant low emission development strategies, programs and plans. A combination of fiscal incentives within the NEPA and EDP, financial and technical support from international climate mechanisms, and enforcement of existing legislation for environmental safeguards such as NEPA and Environment Assessment Act 2000 will also be required.

In order to ensure efficient and coordinated approaches to implementation of mitigation and adaptation priorities, existing institutional arrangements such as the National Environment Commission (which also acts as the high level National Climate Change Committee) and Multi-Sectoral Technical Committee on Climate Change will play the lead role in coordinating action on climate change in Bhutan. Synergies will also be considered in planning and implementation of mitigation and adaptation actions across relevant agencies

and sectors, between national and local level planning, across sub-national regions, and also with actions under other multilateral environmental agreements. Public private partnership (PPP) model of implementing actions will also be considered where appropriate.

Enhancing awareness and capacity through education, research on areas of concern in Bhutan and institutional strengthening will also be essential for successful implementation of the intended actions. Other indirect success may also be achieved through advocacy and behavioural changes to promote sustainable consumption, energy efficiency and other climate friendly actions.

Since the intended actions in the INDC apply to the post 2020 period, the priority mitigation and adaptation actions within this INDC will be considered and integrated in the preparation of the 12th Five Year Development Plan (2018-2023) and also subsequent five year plan periods. The cycles of the national five-year development plan process along with the cycles of the INDCs, yet to be determined under the new climate agreement, will form the basis for the national process to review progress in actions and support received.

Bhutan is already spending its own resources for some climate change adaptation and mitigation actions through the budgeting for the current five-year plan, which includes an objective for carbon neutral and climate resilient development. Our hydropower projects are also being built at great additional expense to take into account the need to withstand catastrophic GLOF events. The Bhutan Trust Fund for Environmental Conservation also provides local funding for projects addressing mitigation and adaptation.

However the scale of funding available to address both development needs and the additional burden of mitigation and adaptation will be significantly higher than presently available. As a least-developed country, with a young population and pressing needs and imperatives for economic development, the successful implementation of our intended actions to mitigate will depend on the level of financial and technical support received. Implementing adaptation measures through the NAP process with sufficient funding will also be required to ensure that progress made over the past few decades are not derailed by the adverse impacts of climate change.

Bhutan remains committed to a globally collective effort in addressing climate change and keeping the planet safe for all life, and strives towards an ambitious and legally binding agreement to keep global temperature increase at safe levels of not more than 1.5 degrees Celsius.



INTENDED NATIONALLY DETERMINED CONTRIBUTION FROM THE PLURINATIONAL STATE OF BOLIVIA

In accordance with the relevant paragraphs of Decisions 1 / CP.19 and 1 / CP.20, Bolivia communicates its Intended Nationally Determined Contribution (INDC), conditional to the new climate agreement to be approved at the COP 21 effectively reflects article 4.7 of the United Nations Framework Convention on Climate Change (UNFCCC), which states: " ... the extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties."

Respecting and demanding compliance with the UNFCCC, the Plurinational State of Bolivia observed the intention of several Annex I countries to standardize the emission reduction responsibilities eliminating the principle of Common but Differentiated Responsibility, through the figure of a standard "contribution" for all countries, regardless of the historical responsibility, as well as limiting responsibility for the provision of means of implementation under article 4.7 of the UNFCCC aforementioned.

Therefore, in Warsaw COP19 the Plurinational State of Bolivia submitted a "LEGAL INTERPRETATION" in regards to the INDC, stating that to Bolivia, decision FCCC/ADP/ 2013/L.4/Add.1 should be applied in strict accordance to Article 4, in particular paragraph 7 of the Convention.

Consequently, the contribution made by Bolivia applies under strict compliance with Article 4.7 of the UNFCCC.

Bolivia's contribution bears into account that the new climate agreement must be developed over the basis of the vision of the peoples and social organizations, to be revealed in the conclusions of World People's Conference on Climate Change and the Defence of Life in October 2015, rejecting in turn the vision of empires and transnational corporations, paving the way for a solution to the climate crisis from another alternative to the current view.

The structural cause that has triggered the climate crisis is the failed capitalist system. The capitalist system promotes consumerism, warmongering and commercialism, causing the destruction of Mother Earth and humanity. The capitalist system is a system of death. Hence, capitalism is leading humanity towards a horizon of destruction that sentences

nature and life itself to death. In this regard, for a lasting solution to the climate crisis we must destroy capitalism.

The capitalist system seeks profit without limits, strengthens the divorce between human beings and nature; establishing a logic of domination of men against nature and among human beings, transforming water, earth, the environment, the human genome, ancestral cultures, biodiversity, justice and ethics into goods. In this regard, the economic system of capitalism privatizes the common good, commodifies life, exploits human beings, plunders natural resources and destroys the material and spiritual wealth of the people.

Thus, Bolivia presents its intended contribution consistent with its vision of holistic development, according to the provisions of the State Constitution, Law No. 071 of The Rights of Mother Earth and Law N° 300 of Mother Earth and Integral Development to Live Well, guided by the 2025 Patriotic Bicentennial Agenda and its 13 pillars, as well as national plans for medium and long-term.

Bolivia understands Living Well as the civilizational and cultural horizon alternative to capitalism, linked to a holistic and comprehensive vision that prioritizes the scope of holistic development in harmony with nature and as structural solution to the global climate crisis. Living Well is expressed in the complementarity of the rights of peoples to live free of poverty and the full realization of economic, social and cultural rights and the rights of Mother Earth, which integrates the indivisible community of all systems life and living, interrelated, interdependent and complementary beings who share a common destiny.

Distribution of global emissions budget

Protecting the integrity of Mother Earth, and especially the rights to regeneration in the context of climate change can be achieved through the distribution of the budget surplus of carbon emissions and greenhouse gases among all countries of the world in the context of climate justice criteria.

The climate crisis which we live has been generated by the exploitation of atmospheric space by and in favor of developed countries, as expressed in the third paragraph of the UNFCCC, "*Noting* that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs."

The AR5 IPCC report states that a total of 2,000 GtCO² were emitted between 1750 and 2010, 1,160 correspond to the member countries of the Organization for Economic Cooperation and Development (OECD) till 1990 and the transition economies, in other words Annex I countries.

Much of the corresponding non- Annex I emissions during historical periods of colonialism and neo- colonialism favored the enrichment of the industrial and imperialist countries; configuring a climate colonialism expressed through the control of atmospheric space.

Country contributions should be consistent with the recognition of historical responsibility and as expressed in paragraph 2 of decision 1 / CP18 " ... the efforts of the parties should be made on the basis of equity and common but differentiated responsibilities and respective capabilities ... and should take into account the imperatives of equitable access to sustainable development, the survival of countries and protecting the integrity of Mother Earth. "

Bolivia has proposed a fair and equitable sharing of atmospheric space, taking into account the capacity for regeneration and protection of the integrity of Mother Earth. To not exceed 1.5 degree temperature by 2050, the budget set by the Intergovernmental Panel on Climate Change (IPCC) is 650 GtCO². In order to implement the distribution of remaining carbon budget that would ensure the stabilization of concentrations of greenhouse gases in the atmosphere, Bolivia has proposed a Climate Justice Index for the fair and equitable sharing of the global emissions budget; moreover this means of distribution would impart the carbon budget based on the following indicators:

- a) *Historical responsibility*. Includes responsibility for the cumulative emissions since the pre-industrial era (1750-2010).
- b) *Ecological Footprint*. A calculation based on the amount of land, water and forest people of the countries need to satisfy all the goods consumed and to assimilate the waste they generate.
- c) *Capacity development*. Represents the conditions of economic and social development of each country.
- d) *Technological capacity*. Measures the ability of countries considering their technological development based on expenditures on Research & Development and industrial performance of each of them, considering their capacity to produce and export goods with high technology.

This index fairly determines the effort required by each country to stay within the budget of remaining emissions that corresponds to them. This implies that countries with high historical responsibility, high ecological footprints, greater development and greater technological capabilities, have a smaller share of the budget.

As a result of implementing the Bolivian index proposal, non- Annex I countries would have a total of 89% of the budget and Annex I countries only 11%. Also, to perform monitoring and sanction non-compliance with international commitments involves establishing an *International Climate Justice Tribunal*.

National Circumstances

Bolivia has all the climates of the intertropical zone, from tropical climate in the plains to polar climate— as it reaches the high mountains, thus the impacts of climate change are diverse. During the past 50 years, the country has lost about 50% of the glacier surface and higher temperatures and stronger precipitation events are expected during the rainy season, which will expose different regions of the country to prolonged dry periods and an increase in the frequency and magnitude of floods, flash floods, hailstorms, overflowing

rivers, landslides and frost. The effects are evident in the social sectors (health, education, housing), economic (agriculture and industry) and infrastructure and services, which affect the way of life and production of the most vulnerable populations.

From 1982 to 2014, more than 4 million people have been directly affected by these phenomena, reaching about 40% of the population with an economic impact between 1-2% of GDP, depending on the severity of the weather event. By 2030, 27% of the country could be affected by persistent drought and 24% with highly recurrent floods.

Extreme poverty in Bolivia reached 17.3% of the population in 2015, and this will be eradicated by 2025. However, this is not possible if there are no actions to fully develop the national economy and reduce the impacts of change climate. Thus, Bolivia has prioritized a linkage of mitigation and adaptation actions in complementarity with the holistic development in the areas of water, energy, forests and agriculture as part of its 2025 Patriotic Agenda, and national development plans.

Bolivia has launched programs "My Water" and "My Irrigation" that have led to increased drinking water coverage to 90% in urban areas and 61% in rural area by 2012, and in relation to irrigation, irrigation coverage has increased to 362,000 hectares by 2014, on the basis of comprehensive and community management of water resources. In the immediate future, Bolivia plans to implement multipurpose hydro projects to enable coverage of irrigation and water storage capacity in the country and thereby strengthening adaptation to climate change.

Bolivia has large forest areas, with 52.5 million hectares in 2015. In Bolivia, forests provide livelihoods for communities and small producers and their environmental functions promote and contribute to the *living well* of urban and rural populations. Protected areas in Bolivia cover 22.5% of the national territory, of which 17 million hectares are under national jurisdiction. Bolivia considers that forests facilitate the provision of environmental functions, strengthen food security and livelihoods of local and national population in a complementary manner and promote timber and non-timber forest production and agroforestry systems, consolidating their contribution to development of the country. Thus forests contribute jointly to mitigation and adaptation to climate change.

With regard to agricultural production, Bolivia faces the challenge of expanding the area of food production in areas with agricultural potential mindful of environmental functions and promoting community and small farmers production. To date, Bolivia has an area of 3.5 million hectares for agricultural production and 2.2 million hectares for livestock production, which represents 5% of the country. Small farms and communities comprise a total of 57% of the titled area, 33% owned by the State, including protected areas and public land, and 9% are medium and large properties. Thus, agricultural production with the participation of smallholders and communities has an important contribution to climate change adaptation.

With regard to energy, Bolivia has increased access to electricity to 82% of the population in national average, and plans to achieve universal electricity coverage by 2025. Energy development is a key factor in expanding economic diversification, producing renewable energy and improving energy efficiency. Electric power will become one of the generators

of wealth for Bolivians through investments in hydropower and alternative energy. This will also increase the export capacity of energy from renewable sources to neighbouring countries. Therefore, energy is an important part of efforts to mitigate climate change.

Bolivian Context for actions on mitigation and adaptation to climate change

Living Well with the vision of holistic development in which the Intended Nationally Determined Contribution of Bolivia is based on, includes the construction of a holistic human being without material, social and spiritual poverty; universal access of the population to all basic services, in the context of the human right to water; a social and community production model that generates wealth and redistributes it to build a more equal society; productive growth based on diversification by strengthening the energy, agriculture and tourism, and boosting oil and mining sectors with industrialization; roadside, railway and river integration of the country, connecting populations and the flow of goods between the Atlantic Ocean and Pacific Ocean; and an environmental management model for living systems to eradicate poverty, fully develop the local and national economies in a complementary way with the conservation of environmental functions and the development of sustainable production systems.

Bolivia considers that it must make fair and ambitious efforts to address the impacts of climate change, although it has not caused the phenomenon of global warming. Also, Bolivia defines its national contribution in the context of the 17 Sustainable Development Goals and its 169 goals, which are part of the new development agenda, from a holistic view of the commitments, to be implemented voluntarily by each State and framed by the Political Declaration of the General Assembly resolution document. The fight against climate change for sustainable and harmonious development with nature on the basis of management systems life is present in this vision.

This contribution responds to the application of a holistic approach to the construction of Living Well with joint impacts of mitigation and adaptation to climate change and takes place in a context of expanding the productive capacity of the country with diversification in the fields of agriculture and energy as sustainable sources of income for the country, strengthening the environmental functions, and the role of forests in the integral development, eradicating poverty as the basis of living well.

Bolivia will make an ambitious contribution in the context of national efforts; However, results and actions to mitigate and adapt can increase if it has the provision of means of implementation through mechanisms of international cooperation in the framework of the Convention, in accordance with the principles and provisions of the Convention, in particular Articles 4.4 and 4.7.

Bolivia considers that the joint approach between mitigation and adaptation in the context of overall development plans, is the only way to systematically address climate change, including the links between the different social, economic and environmental dimensions. Bolivia raises the need to establish a mechanism for international cooperation to support the integral development and climate resilience and the start of implementation of a Joint Mitigation and Adaptation Mechanism for Integral and Sustainable Management of Forests to strengthen synergies between mitigation and adaptation climate change in the field of

forests.

Comprehensive structural solutions and results and national action on climate change

To contribute in solving the climate crisis based on the alternative vision of living well, helping to implement proposals that allow the world to advance structural solutions to the climate crisis, Bolivia presents the following contribution in two dimensions: one linked to the structural solutions, and other results and national actions within the framework of holistic development.

Structural solutions to the climate crisis

1. Adoption of a new model of civilization in the world without consumerism, war-mongering, and mercantilism, a world without capitalism; build and consolidate a world order of Living Well that defends and promotes the integral rights of our peoples, undertaking the path of harmony with nature and respect for life.
2. Construction of a climate system based on responsibility to Mother Earth, the culture of life and the full realization of humanity in their holistic development, humanizing the economy, surpassing the simplistic approach to decarbonization of the economy.
3. Protection of the Rights of Mother Earth in an articulated and complementary manner to the rights of peoples to their development.
4. Defense of universal common goods such as the seas and oceans, water, atmospheric space, as well as the technological monopoly, promoting people's access to the common heritage.
5. Elimination of patents on technologies and recognition of the human right to science and technology of life.
6. Effective implementation by governments of the human right to water.
7. Establishment of the International Court of Justice Climate and Mother Earth to enable countries to fulfill their international commitments to climate change in a context of respect for the rights of peoples and of Mother Earth.
8. Allocate the resources of the military machinery of the imperial powers and the war-mongers to finance the activities of the peoples against climate change.
9. Eradication of commodification of nature and carbon markets promoting business climate millionaires, which do not solve the problem of the climate crisis.
10. Decolonize natural resources environmental colonial biased views that see the peoples of the South as forest rangers of Northern countries and communities as enemies of nature.

Results and national actions in the context of holistic development

Bolivia considers its nationally determined contributions as an ambitious and just effort, considering its national circumstances. Bolivia's contribution articulates in two periods in an integrated manner. The first is linked to the 2015-2020 period, in the understanding that all countries should undertake ambitious efforts now in order to achieve ambitious reduction in increase of global temperature. The second is related to the 2021-2030 scenario. Also, both periods consider the additional results that could be achieved with the support of international cooperation and the financial mechanism of the UNFCCC, understanding cooperation as grant-based finance and technology transfer.

The contribution seeks in an integrated and complementary manner different intended results linked to the achievement of living well in the context of climate change with regards to water, energy, forest and agriculture and livestock, in the following manner:

1. **2015-2030 Period with National Efforts.** The Plurinational State of Bolivia estimates reaching the following objectives and results in mitigation and adaptation in the framework on holistic development by 2030, with a 2010 reference year:

- Water. Increase in a holistic manner the adaptation capacity and systematically reduce the hydric vulnerability in the country.
 - Energy. Increase the electric generation capacity through renewable energies for local and regional development.
 - Forest and agriculture. Increase the capacity of joint adaptation and mitigation through the comprehensive and sustainable management of forests.
- i) **With regards to water**, actions will be promoted with a focus on adaptation to climate change and risk management, aiming for the following results:
- Triplicate (3.779 million m³) water storage capacity by 2030, in relation to 596 million m³ in 2010.
 - Achieve 100% drinking water coverage by 2025, with resilient delivery services. 100% coverage of drinking water achieved by 2025, with resilient delivery systems and services.
 - Reduction of the water component of the Unsatisfied Basic Needs (NBI, for its name in Spanish) to 0.02% by 2030.
 - Triplicate irrigation surface to over 1 million hectares by 2030 with regards to 296.368 hectares in 2010, duplicate food production under irrigation by 2020 and triplicate by 2030, with regards to 1,69 million metric tonnes of 2010. In this manner, resilient agriculture and livestock systems will be achieved.
 - Significant improvement of social participation for local water management, increasing to 80% the number social organizations with resilient systems with respect to 35% of 2010.
 - Increase food production under irrigation, to more than 6 millions metric tonnes by 2020 with regards to 2010.
 - Increase the Gross Domestic Product (GDP) to 5,37% by 2030, with the contribution of resilient water and irrigation systems.
 - Reduction of water vulnerability from 0,51 to 0,30 units by 2030 with regards to 2010, which is measured with the *National Index of Hydric Vulnerability* in the country, considering aspects related to exposures (treats), hydric sensitivity (hydric scarcity) and adaptation capacity.
 - Increase adaptation capacity from 0,23 units of 2010 to 0,69 units by 2030, which is measured through the *National Index of Adaptation Capacity of Water*

The following measures and actions will be developed for the achievement of results linked with water:

- Development of resilient infrastructure for the production and service sector.
- Construction of coverage networks of drinking water and sewage.

- Reuse of water for productive purposes to increase food production.
- Restoration of vegetation cover (trees, grasslands, wetlands and others) to prevent erosion and reduce damage due to adverse climatic events.
- Increase in irrigated area through revitalized irrigation systems, irrigation technology, irrigation dams, water harvesting, and multipurpose water reuse projects.
- Construction of multipurpose hydropower to expand the water storage capacity.
- Treatment plants for domestic and industrial wastewater including from mining and other activities.
- Strengthening community management, union and local capacities for adaptation to climate change, including community irrigation management and collective management of water services.
- Implementation of ancestral practices and knowledge, in the context of integrated water management.
- Risk management actions to mitigate common threats of the risks of drought and flooding.
- Installation of hydrometeorological, geological and seismic stations articulated nationally.
- Management of water quality service and loss reduction, including promoting the use of artefacts in low water consumption, efficient health systems and alternative technologies.
- Rainwater harvest for various domestic uses, as well as the re-use of gray water from showers, sinks, laundries and downspouts, for various domestic purposes, except for human consumption.
- Broader use of water harvesting technologies, conservation of soil moisture and water more efficiently (irrigation and livestock) (such as when there are shortages and stock up as store when there are plenty).
- Implementation of treatment systems and water purification to improve water quality for human consumption.

ii) **With regard to energy**, actions are promoted with a focus on mitigation and adaptation to climate change and holistic development, achieving the following results:

- Increased participation of renewable energy to 79% by 2030 from 39% in 2010.
- Increased participation of alternative energy and other energy (steam combined cycle) from 2% in 2010 to 9% in 2030 in the total electrical system, which implies an increase of 1,228 MW by 2030, compared to 31 2010 MW.
- Increased power generation to 13,387 MW electricity sector by 2030, compared to 1,625 MW by 2010.
- Reduced the Unsatisfied Basic Needs (NBI) for electricity coverage from 14.6% in 2010 to 3% by 2025.
- Develop the export potential of electricity, generated mainly by renewable energies, reaching to export an estimated 8,930 MW by 2030, increasing energy state income.

- Reduce moderate poverty to 13.4% in 2030 and eradicated extreme poverty by 2025, according to impact, among others, of the generation and energy coverage, including growth, distribution and redistribution of energy income.
- Contribution to the growth of Gross Domestic Product (GDP) to 5.4% in 2030 due to the impact of the energy sector.

To achieve results related to energy the following measures and actions will be promoted:

- Change and diversification of the energy matrix with renewable energy growth through the construction of hydropower (small and medium hydropower plants, large hydro and multipurpose) and boost alternative energy (wind, biomass, geothermal and solar), and use other sources of energy (steam combined cycle).
- Universal energy that promotes universal access to clean energy with emphasis on the poorest population.
- Large networks of power lines for transmission and distribution services coverage.
- State participation in energy generation, creating income and implementing policies and redistribution of wealth.
- Promotion of energy surplus export from renewables sources, positioning Bolivia as a regional powerhouse with clean energy.

iii) **In relation to forests and agriculture**, actions will be promoted with a focus on joint mitigation and adaptation to climate change and holistic development, achieving the following results:

- Zero illegal deforestation by 2020
- Increased the surface of forested and reforested areas to 4.5 million hectares by 2030.
- Increased forest areas with integrated and sustainable community management approaches with 16.9 million hectares in 2030, in reference to 3.1 million hectares by 2010.
- Strengthened environmental functions (carbon capture and storage, organic matter and soil fertility, biodiversity conservation and water availability) in about 29 million hectares by 2030.
- Contribution to Gross Domestic Product (GDP) growth of 5.4% in 2030, boosted by agricultural and forestry production complementary to conservation.
- Reducing extreme poverty to zero in the population dependent on forests by 2030, based on approximately 350 thousand people by 2010.
- Increase net forest cover more than 54 million hectares by 2030, compared to the 52.5 million of 2010.
- Contributing to an increase in Gross Domestic Product (GDP) of 5.4 % in 2030, furthered by agricultural and forestry production, complementing conservation efforts.
- Extreme poverty has been reduced to zero within the population that depends on forests by 2030 from approximately 350 thousand people in 2010.
- Net forest coverage has increased in 2030 to more than 54 million hectares compared to the 52.5 million in 2010.
- Joint mitigation and adaptation capacity has increased in areas covered by forests, agricultural and forestry systems from 0.35 units in 2010 to 0.78 in 2030, as measured by the *Index of Sustainable Forest Life*, achieving productivity and

conservation systems that are both complementary and resilient.

To achieve the results mentioned beforehand in forests and in agricultural, forestry and agro-forestry production systems, the following measures and actions will be implemented:

- Resilience has been achieved through the strengthening of environmental functions and the productive capacities of agricultural and agroforestry systems.
- Integrated and sustainable management of forests has strengthened through the management of timber and non-timber products in an integrated and sustainable manner.
- Conservation of areas with high environmental functions.
- Restoration and recovery of degraded soils and forests.
- Consolidation and strengthening of regenerative capacities of forests and forest systems.
- Implementation of control, monitoring, and tracking systems for the appropriate use of areas of forest life.
- Actions related to supervision and control for the proper management of forests has been achieved.
- Actions pertaining to the proper management of protected areas and forest areas with conservation priority have been achieved.
- Consolidation of agroforestry systems.
- Transition to semi - intensive systems of livestock management and integrated management of agroforestry and silviculture techniques.
- Transition to agricultural systems with sustainable management practices.
- Reduction of vulnerabilities in agricultural, fisheries, and agro-forestry systems of production.
- Sustainable use of biodiversity resources, wildlife and aquatic life for food security and sustainable industrialization.
- Control of illegal deforestation and establishment of systems of control and monitoring of deforestation, fires and forest fires.
- Training in technologies adapted to climate change (local knowledge and modern technologies).
- Actions to reduce the vulnerability of production systems in a climate change scenario.
- Usage of better local adapted varieties of species suited for the climate, and resistant to pests and diseases.
- Measures of agricultural and livestock production insurance to include additional conservation actions, making resilient agricultural and forestry production systems.
- Development of research and information on alternatives for climate change and adaptation technologies.
- Strengthening of local capacities for adaptation to climate change.
- Strengthening community based stewardship in forest management and farming systems.
- Forestation and reforestation, forest plantations, parks and urban forests.

2. **Period 2015-2030 with International Cooperation.** In the framework of international cooperation and with the support of the financial mechanism of the United Nations Framework Convention on Climate Change estimates that Bolivia could increase their results as detailed below:

i) In regards to water, the following results is estimated:

- Water storage capacity has quadrupled in 2030 (3.779 million m³) compared to 2010 (596 million m³).
 - Agricultural irrigation has increased to 1.5 million hectares by 2030, compared to 2010 with 296,000 hectares.
 - Agricultural production under irrigation has quadrupled by 2030 (9.49 million tons) compared to 2010 (1.69 million MT) .
 - Local water management by social organizations has increased to 90 % by 2030.
- ii) In regards to energy, the following results is estimated:
- Increased participation of renewable energy to 81% by 2030, compared to 39 % in 2010 .
 - We have consolidated the participation of alternative energy and other energy (steam combined cycle) to 9 % of the total electrical system with an installed capacity of 1,378 MW by 2030.
 - Bolivia's energy export potential has increased, generated mainly from renewable energy to power 10,489 MW by 2030.
- iii) In regards to forests and agriculture, the following results is estimated:
- Community forest management has increased sevenfold in the area of forest management in 2030.
 - Timber and non-timber production has increased by 40%, doubling food production from the integrated management of forest and agricultural systems in 2030.
 - Increased reforestation by 6 million hectares by 2030.

ANNEX

Additional information Intended Nationally Determined Contribution by

the Plurinational State of Bolivia

This annex contains the methodologies used to calculate the results of the Intended Nationally Determined Contribution by the Plurinational State of Bolivia.

Global emissions budget

Bolivia has developed the *Climate Justice Index* to calculate the participation of countries in the distribution of CO2 budget fairly and with a climate justice criterion. For this purpose data of the ecological footprint, historical responsibility, development capacity, technological capacity, and the population of the countries were used.

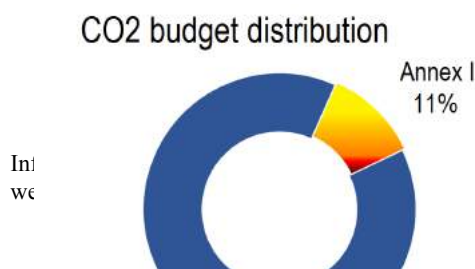
The following calculation for the these variables and data sources are used: i) for the calculation of the ecological footprint, the Ecological Footprint Global Index used by the UN Programme (UNEP) and the Convention on Biological Diversity (CBD), corresponding to *Footprint Network*; ii) The historical responsibility is calculated based on CO2 emissions since 1750, distributed according to IPCC data for 2010; iii) For the calculation of development capacity, the following was used: i) Gross Domestic Product (GDP) with World Bank data, ii) Poverty as a percentage of the population living on less than \$ us1,25 with data from the Statistical Division of the United Nations, and iii) the Human Development Index (HDI) developed by UNDP; and iv) The technological capability used the Performance Index of Industrial Competition by UNIDO and R&D expenditure as a percentage of GDP based information from the World Bank.

The equation developed by Bolivia in calculating the *Climate Justice Index* comprises the ecological footprint (hj), historical responsibility (rj), development capacity (dj), technological capacity (tj) and population (pj) as detailed below:

$$ij = \exp(-\theta_1 h_j - \theta_2 r_j - \theta_3 d_j - \theta_4 t_j + \theta_5 p_j) \cdot \ell_1$$

The indicator of percentage distribution of the carbon budget (ij) is obtained by multiplying each variable normalized by a weight $\theta \in R_{0,1}$ and adding the result to the equation, where the signs of the parameters $\theta \in R_{0,1}$ reflect the direction the relationship between the variable and the percentage of budget.

Graph 1. Distribution of the CO2 budget



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t, please refer to the Spanish version published on the UNFCCC

This graph shows the percentage distribution of the countries grouped in Annex I and non-Annex I, defined in the context of the UNFCCC, resulting from the application of this methodology. The indicator percentage distribution of carbon budget is obtained by multiplying each variable standardized by a specific weight with a vision of climate justice that gives greater relevance to the historical responsibility, population and development capacity when calculating the percentage distribution of CO2 budget equivalent. The calculations reflect the direction of the relationship between the variables and the percentage of budget (low budget to greater ecological footprint, greater historical responsibility, greater development capacity and / or technology, and higher budget compared to a larger population).

Water

Bolivia has developed the *Hydric Vulnerability Index* based on the conceptual framework on vulnerability of the Fourth Report of the Intergovernmental Panel on Climate Change (IPCC) in 2007. It establishes that vulnerability depends on the sensitivity and adaptation capacity of the system. Base on this:

$$\text{Hydric Vulnerability} = \text{Hazard} + \text{Sensitivity of Water System} - \text{Water Adaptability}.$$

This index is based on an analysis of the comprehensive effect (external and internal), taking into account: i) intensity, persistence and recurrence of the threats of climate change, ii) sensitivity of living systems and communities that coexist in such systems and iii) ability to adapt to climate change, which in turn includes: catchment, reservoir, storage and provision of water for human consumption and irrigation, increased social community water management, improving agricultural production with more efficient irrigation systems, wastewater reuse in big cities, and the universal expansion of national coverage of drinking water.

Bolivia has also developed the Index of Adaptation Capacity in Water, which was calculated using data from community management (gj), productivity (yj) water storage (cj), access to water (aj) and poverty (pj) between 2015 and 2030, through the following equation:

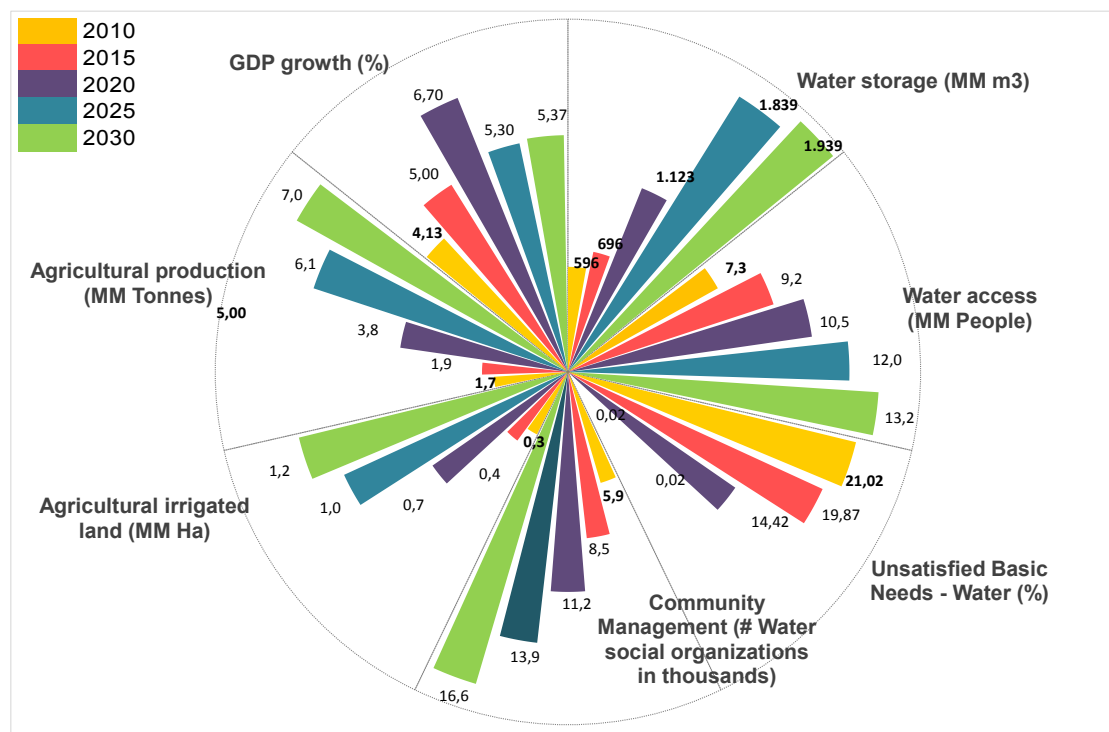
$$i_j = \theta_1 gj + \theta_2 yj + \theta_3 cj + \theta_4 aj - \theta_5 pj$$

This index (i_j) was obtained by multiplying each variable normalized weight $\theta \in \mathbb{R} \wedge 0.1$ and adding the result to the equation, so that an increase in community management, productivity, storage and access to water will increase the value of the indicator, reflecting

greater resilience, while an increase in poverty will reduce the value of the indicator representing less adaptability.

The main variables analyzed are impacts and outcomes with respect to water, and articulated in an integrated and complementary way, the same as shown in the graph below.

Figure 2. Reducing water vulnerability and increasing adaptive capacity in water



The above graph displays, in an integrated manner, the articulation of different variables associated with the storage of water and its impact on increasing access to water and increased agricultural production, while promoting the growth of agricultural GDP and reducing poverty by unsatisfied basic needs, and including community management of social organizations as a fundamental tool for achieving resilience related to water.

Energy

For the modelling of the scenarios in the electricity sector, as well as the calculation of carbon equivalent emissions (CO₂e) and the optimization for each stage of electricity generation, the OSeMOSYS program (Open-Source Energy Modelling System), developed by the Royal Institute of Technology in Sweden (KTH)¹. This program is an open source software that allows modelling and optimization the planning of medium and long-term energy systems.

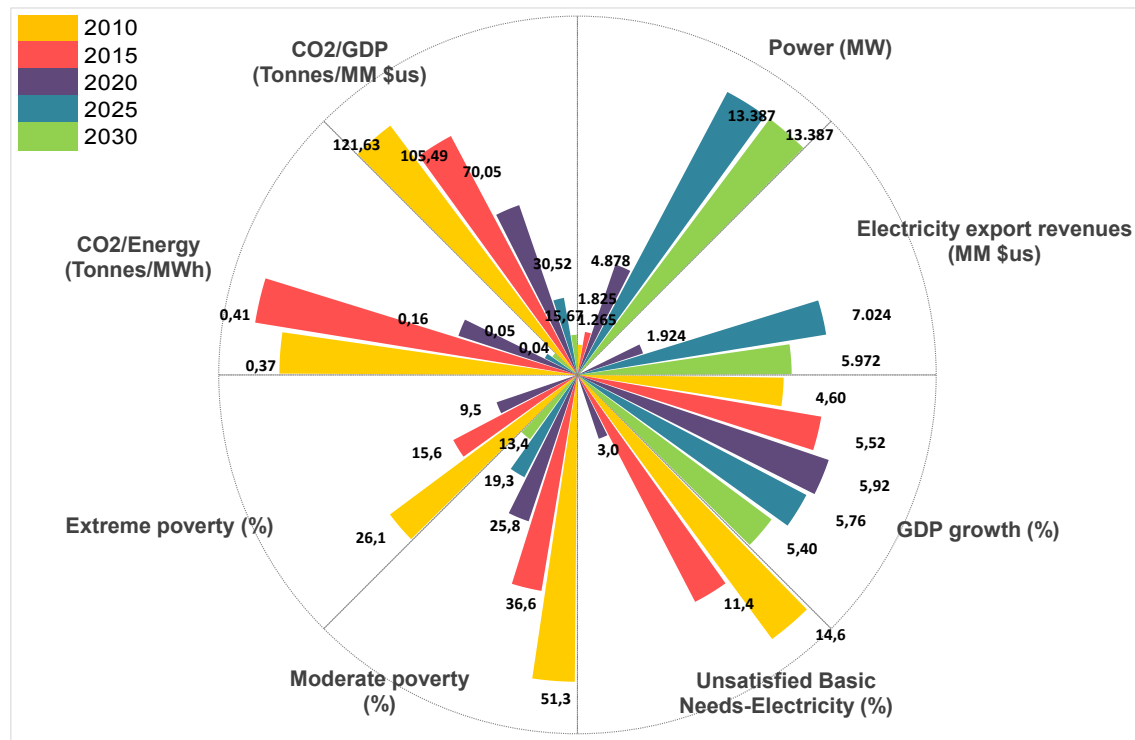
CO₂e emissions are estimated with the OSeMOSYS model using the emission factor of

¹ For further reference, visit: www.osemosys.org

each project and plant (the ability to generate CO2 per MWh). Therefore, we observe a trend in in emissions growth and avoidance of greenhouse gases for scenarios with national effort and international cooperation.

The main variables analyzed are impacts and outcomes with respect to energy articulated to integrated and complementary means, as explained in the graph below.

Figure 3. Development of the electricity sector with a focus on climate change



The graph above displays, in an integrated manner, the articulation of the most important different variables related to the electricity sector. The increase in electricity power influences the increase in export earnings, which in turn promotes the growth of GDP and this in the impact of reducing electricity NBI through electric coverage and reducing moderate and extreme poverty. Also, this displays the CO2 / energy and CO2 / GDP ratio, with a significant decrease in the proportion of CO2 influence in the economy and in power generation. Overall, this process contributes in reducing emissions from the electricity sector.

Forestry and agriculture and livestock

Bolivia has developed the Sustainable Life of Forest Index to measure the combined capacity to mitigate and adapt to the comprehensive and sustainable management of forests, agricultural and agroforestry production systems.

The index articulates environmental functions (f_j), poverty (p_j), community management (g_j), production (y_j), and forest cover (c_j), between 2015 and 2030. As environmental functions are provided for the following: i) carbon capture and storage; ii) the presence of organic matter in the soil; iii) availability of water; and iv) the presence of biodiversity in areas with high conservation value.

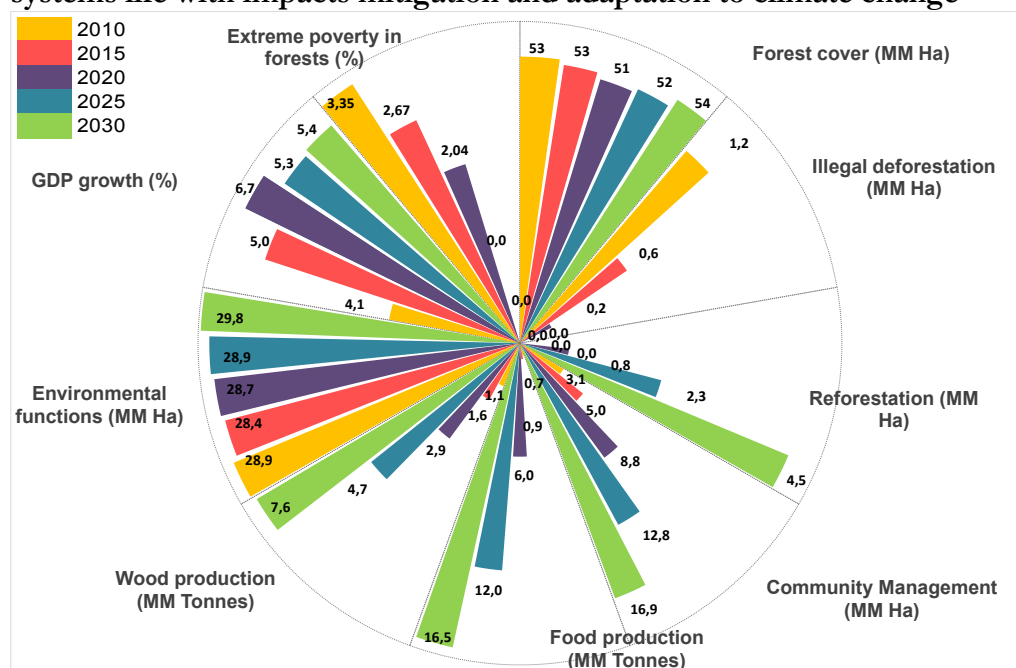
The equation designed by the Plurinational State of Bolivia to calculate the index *Sustainable Live of Forest Index* is:

$$i_j = \theta_1 \tilde{f}_j - \theta_2 \tilde{p}_j + \theta_3 \tilde{g}_j + \theta_4 \tilde{y}_j + \theta_5 \tilde{c}_j$$

The Index (i_j) is obtained by multiplying each variable standardized by a weight $\theta \in \mathbb{R}^{0,1}$ and adding the result in that equation, so an increase in environmental functions, community management, production and higher net forest cover, will increase the value of the index of aggregate capacity to mitigate and adapt, while a rise in poverty will reduce the value of the index.

The main variables analysed are results and impacts in relation to forests and agriculture and livestock articulate in an integrated and complementary way, as presented in the chart below.

Figure 4. Integrated and sustainable management of forests and agricultural systems life with impacts mitigation and adaptation to climate change



In the graph above the relationship between variables related to the integrated and sustainable management of forests and agricultural systems of life are displayed, highlighting the importance of community management of forests, with impacts on the growth of food production and timber forest products. The importance of reforestation,

reduction of illegal deforestation and increased forest cover in a scenario maintaining environmental functions is also displayed. As a result the increase of agricultural and forestry GDP impacts the reduction of national extreme poverty.

Bosnia and Herzegovina is a decentralized country comprising two entities (the Republic of Srpska and the Federation of Bosnia and Herzegovina) and Brčko District. The Federation of Bosnia and Herzegovina is sub-divided into 10 Cantons. The two entities and Brčko District manage environmental issues through laws, regulations and standards. The Bosnia and Herzegovina Ministry of Foreign Trade and Economic Relations has responsibility for the coordination of activities and harmonizing of plans of the entities' governmental bodies and institutions at the international level, in energy, environmental protection, development and the exploitation of natural resources. Decision-making involves the Council of Ministers, the governments of two Entities and Brčko District. Potential candidate for EU membership (Stabilization and Association Agreement signed in 2008).

Intended Nationally Determined Contributions (INDC)	Bosnia and Herzegovina
Type	Emissions reduction relative to a Business As Usual baseline
Coverage	<p>Economy-wide, in particular, as determined by decisions of the UNFCCC Conference of the Parties on reporting covering the following sectors:</p> <ol style="list-style-type: none"> 1. Energy <ol style="list-style-type: none"> A. Fuel combustion (sectoral approach) <ul style="list-style-type: none"> - Energy Industries - Manufacturing industries and construction - Transport - Other sectors B. Fugitive emissions from fuels <ul style="list-style-type: none"> - Solid fuels - Oil and natural gas 2. Industrial processes <ul style="list-style-type: none"> - Mineral products - Chemical industry - Metal production - Other production 3. Agriculture <ul style="list-style-type: none"> - Enteric fermentation - Manure management - Agricultural soils 4. Land-use change and forestry (sinks) <ul style="list-style-type: none"> - Changes in forest and other woody biomass stocks 6. Waste <ul style="list-style-type: none"> - Solid waste disposal on land - Waste-water handling
Scope	<p>The INDC includes information on the following GHGs:</p> <ul style="list-style-type: none"> • Carbon dioxide (CO₂); • Methane (CH₄); • Nitrous oxide (N₂O);
Base year	1990

Time frames / periods for implementation	2030
Reduction level	<p>In line with the trend of consumption and energy production growth, as a result of development of the country, total emissions also have an upward trend. According to the developed scenarios - their peak occurs in 2030; according to the baseline scenario (BAU) in 2030 expected emissions are 20% higher than the level of emissions in 1990. Emission reduction that BiH unconditionally might achieved, compared to the BAU scenario, is 2% by 2030 which would mean 18% higher emissions compared to the base year 1990. Significant emission reduction is only possible to achieve with international support, which would result in emission reduction of 3% compared to 1990, while compared to the BAU scenario it represents a possible reduction of 23%.</p>
Methodological approaches used, in particular, for measurement and verification of anthropogenic GHG emissions and, in appropriate cases, their absorption	<p>Methodological approaches are based on using the following methodology:</p> <ul style="list-style-type: none"> • Methodology of the Intergovernmental Panel on Climate Change (IPCC) defined by the Convention, on the basis of the reference manual The Revised IPCC Guidelines for National Greenhouse Gas Inventories of 1996, IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry of 2003, and Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Emission Inventories of 2000. INC, SNC, FBUR; • National statistics; • Sectoral forecasts. <p>Base year 1990: 34,043.49 GgCO₂e (without LUCF) Base year 1990: 26,619.96 GgCO₂e (with LUCF)</p> <p>The MRV system in BiH is currently under development (organizational set-up).</p>
Consideration of fairness and ambition based on national conditions	<p>BiH is a developing country and the presented target represents a significant effort and is presented as emissions reduction relative to a Business As Usual baseline. The BiH CO₂ per capita is app 8.2 t (2011), while GDP per capita in 2013 was 3,509 Euro and expressed as Purchasing Power Standards (PPS) amounts 29% of the EU-27 average in 2013, while gross total primary energy consumed per unit of GDP is 0.938 toe / USD 2000. The country consumes about 20% of its GDP on energy. BiH GHG emissions represent less than 0.1% of global total emissions.</p>

Planning process	INDC is based on the existing strategic documents, inter alia, the following: <ul style="list-style-type: none"> • SNC • FBUR • Legislation etc.
International Market Based Mechanisms	Conditional emission reduction is only possible with international support.

Additional information:

According to the baseline scenario, which rests on the BAU principles, and in line with the mitigation scenarios developed through the Second National Communication and updated through the First Biennial Unit Report (under the UNFCCC convention), the expected GHG emission level by 2020 will reach 1990 levels. Under the baseline scenario, a steady increase of emissions is expected by 2030 generally due to higher energy consumption, while energy generated from renewable energy sources remains with low utilization rates. By 2030, GHG emission levels will increase by 20% relative to 2020. This scenario does not include any mitigation action and implies the “business as usual” approach. This scenario does not include any significant changes, incentives or extraordinary amendments to the current approach to the setting and attaining of GHG emission targets. A significant feature of this scenario is a relatively low level of interest and action of state and entity level institutions.

Under this baseline scenario, the power sector, as a major sector, is characterised by a slight increase of the share of power generated from renewable energy sources (RES) due to the feed-in tariff and lower investment costs of RES facilities. However, most of power will come from fossil fuels. In the period 2015 – 2025, the share of RES will increase by 3% every five years and by 5% thereafter.

On the other hand, the reduction of emissions, which BiH will achieve with the currently ongoing and planned mitigation activities, is developed under the unconditional mitigation scenario which shows the decrease of total emissions relative to the baseline (BAU) scenario in the amount of 2% in year 2030. This would result in a slower growth trend of emissions that would increase by 18% in 2030 compared to 1990. This mitigation scenario implies unconditional implementation of minimal technical requirements and sanitation activities related to increase energy efficiency within the buildings sector, e.g. renovation of buildings for which also international financial support is required in order to increase the emission reduction amount and develop a sustainable system, as well as and a very slight trend of increasing the share of RES in electricity production. This scenario does not imply any incentives, nor ambitious or systematic approaches and plans for implementation of EE measures in the buildings sector (public and residential).

Given the specific trends of emissions during the war period, which were as low as 12% of 1990 levels in 1993, and the fact that BiH has been recovering and coming closer to 1990 levels ever since, it is not fully relevant to compare the reduction of emissions to reductions in other countries, which have seen a steady increase of emissions in the same period. BiH is still below 1990 levels and in case the "business-as-usual" practice continues, 1990 levels will be reached in 2020.

On the other hand, provided condition and opportunities are created to access international support / development financial mechanisms, certain effects of emission reductions are likely to be seen in the given period, i. e. it will be possible for the country to slow down on its pathway to 1990 levels.

Provided this condition is fulfilled, emissions by 2030 would be approximately 3% lower comparing to 1990 levels. Unlike the BAU scenario, under which emission levels will have increased by 20% by 2030 relative to 1990 levels, the mitigation conditional scenario under discussion will see a decrease of 3% of 1990 levels by 2030.

It should be noted that the emission reduction trend depends on the development of a scenario for the power sector. In that sense, it is noteworthy to say that, depending on the developments, the idea of linking any development or mitigation scenario to the existing power sector strategies may be abandoned. Given the time when they were drafted, on one hand, and the fact that no significant progress in terms of the implementation thereof has been seen years later, it is assumed that their implementation by 2030 will be quite unlikely.

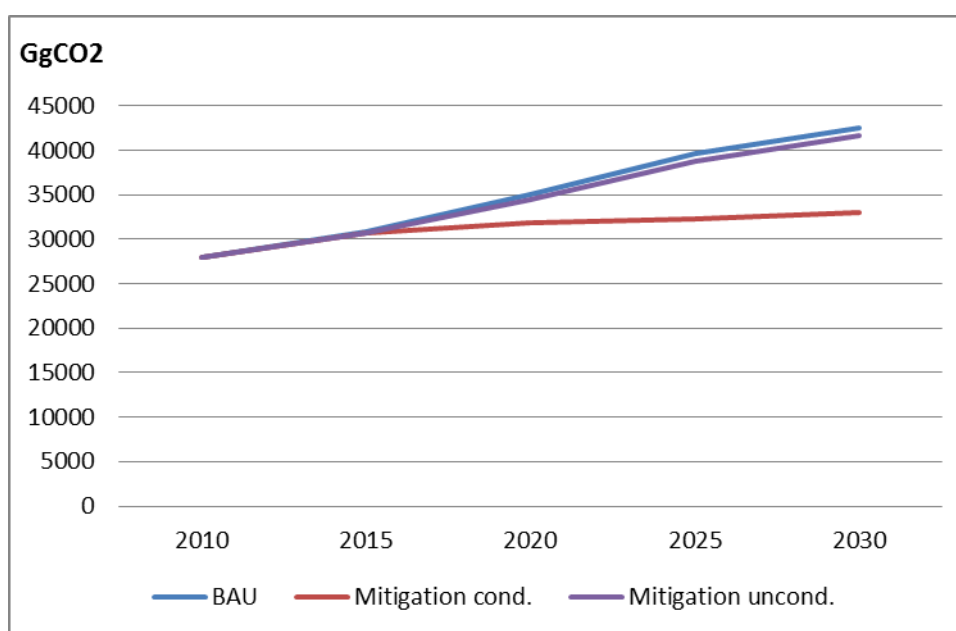
Given the state of affairs and facts on the ground, a number of activities and projects resulting in mitigation effects have been initiated or there are clear intentions to implement them. These project activities are a starting assumption for the intended emission contribution provided there is potential access to international development / financial mechanisms (GEF, GCF, EU pre-accession funds, favourable loans from financial institutions).

This scenario for major sectors implies the implementation of the following activities:

- to enact primary and secondary legislation aligning BiH legislation with EU acquis, including strategies, action plan, etc. for all sectors
- to construct co-generation plants fuelled by wood chips and wood waste from wood processing industry, with the individual power generation capacity of several MW and the total power generation capacity of 70 MW, by 2030.
- to replace the existing thermal power plants with 30% average efficiency with new plants with approximately 40% average efficiency .
- to install the equipment for power generation from methane from two underground mines (five coal-pits)

- to install mini hydro power plants with the power generation capacity of up to 10 MW and the total generation capacity of 120 MW, by 2030
- to install wind farms of the power generation capacity of 175 MW by 2030.
- to install photovoltaic modules of the total power generation capacity of 4 MW by 2030
- to introduce renewable energy sources in the existing district heating systems and to construct new district heating systems fuelled by renewable energy sources
- to reconstruct and modernize district heating grids, boilers and district heating substations
- systemic energy rehabilitation of existing buildings (focus on public sector)

The BAU and considered mitigation scenario are shown in the chart below.



To conclude: provided that Bosnia-Herzegovina is granted access to international development / financial mechanisms and that the relevant institutions are willing to absorb and cost-effectively use international mechanisms for the above mitigation activities, it will be possible to reduce emissions by app 23% in 2030 relative to the baseline scenario, i.e. 3% compared to 1990 level.

All the values (total emission) provided in the baseline, as well as in the given projections, are calculated without the absorption potential (emission sink) of forestry sector. Although the forestry sector is not included in the presented balance of emissions, it is important to note that the value of sequestration capacity is app. 6.470 GgCO₂ in 2015 (1990 sinks – 7,423 GgCO₂), and that the emission projections intend to keep it on that level.



BOTSWANA INTENDED NATIONALLY DETERMINED CONTRIBUTION

BOTSWANA is pleased to communicate its intended nationally determined contribution, as per decisions 1/CP.19 and 1/CP.20.

Botswana intends to achieve an overall emissions reduction of 15% by 2030, taking 2010 as the base year. Base year emission estimation is 8307 Gg of CO₂ equivalent. The targeted emissions reduction will be achieved domestically through strategies and measures which are relevant for the implementation of the target. Consequently, achieving such targets is a function of resource availability and appropriate legal frameworks. Achieving the 15% greenhouse gases (GHGs) emissions reduction target requires robust and comprehensive planning within the sectors. Consequently, it is essential that there are conducive legal frameworks in place to enable the achievement of the national target. This proposed emission reduction path will be subjected to legislative review and endorsement by Parliament.

Botswana is developing a Climate Change Policy and Institutional Framework which will be supported by a Strategy and Action Plan to operationalize the Policy. The Policy will be approved by Parliament in 2016. In addition to the national policy, the development of a strategy will involve development of a long term low carbon strategy, a national adaptation plan, nationally appropriate mitigation actions, identification of technologies, plan for knowledge management capacity development, education and public awareness and a financial mechanism. This total package will ensure that the policy is implementable.

Mitigation Contribution	The country intends to achieve an overall emissions reduction of 15% by 2030, taking 2010 as the base year. The emission reduction target was estimated based on the baseline inventory for the three GHGs being carbon dioxide (CO ₂), methane (CH ₄) and nitrous oxide (N ₂ O). The reductions will be realised from the energy sources which is categorised as the stationary and mobile sources. The country will also continuously implement mitigation measures for the livestock sector to reduce CH ₄ emissions mainly from enteric fermentation though these initiatives are not estimated in the 15%. Initiatives for emission reductions will be developed from long term low carbon strategy
Scope and coverage	Gases: This emissions reduction target was

	estimated based on baseline GHGs inventory for the three GHGs being CO ₂ , CH ₄ and N ₂ O. Sectors: Energy sector (mobile and stationary sources), Waste, and the Agriculture
Methodological approaches	The methodological approaches for estimating national GHGs emissions inventory involved standard IPCC approved methods. Consequently, calculations of GHGs emissions were based on the IPCC Guidelines. For other non-energy sectors such as waste and agriculture, IPCC spreadsheets were adopted and data was input to generate emissions statistics. The country used 100-year global warming potential (GWP) values to estimate the CO ₂ equivalent totals.
Market Mechanisms	Botswana will use market mechanisms under the convention

Adaptation

As semi-arid country Botswana is vulnerable to the impacts of climate change and places high priority on adaptation to reducing vulnerability.

Botswana is developing a National Adaptation Plan (NAP) and Action Plan which will highlight all the priority areas including Climate Smart Agriculture which include techniques such as low to zero tillage, multi-cropping to increase mulching which reduce evapotranspiration and soil erosion. The development of the NAP calls for a broader stakeholder consultation so that the products of this process represent the views and aspirations of all the stakeholders and respond to their needs. The outcome of this process will be significant in guiding how the country responds to the development challenges across all sectors that are attributed to global warming and climate change. This will be informed by already exiting climate change information, socio-economic and development indicators, local experiences as well as existing policies, plans and institutional frameworks. National Adaptation Plan development is coordinated by Ministry of Environment Wildlife and Tourism, with support from the National Committee on Climate Change.

Means of implementation

The Government of Botswana has been spending a significant portion of its national resources to adapt to the impacts of climate variability over the years. With climate variability intensifying in the future, the budget for adaptation measures could increase significantly as depicted under mitigation and adaptation.

Mitigation for GHG emission reductions

It is estimated that to achieve the set target of 15% GHG emission reduction by 2030, the country would require approximately USD18.4 billion. These funds will be allocated to energy and transport sector infrastructural developments which will contribute to emission reductions.

Therefore, future activities need to be conducted on the following key issues:

- Identification of sources of funding for implementation of the mitigation measures
- Share of government and international contribution to support the mitigation measures
- An assessment of the impacts to the national economic growth for allocating national resources to mitigation measures
- Development of conducive legal framework to support 15% emission reductions

Annex

Climate change impacts

Botswana is vulnerable to the impacts of climate change the assessment from the Second National Communication indicate that rainfall has been highly variable, spatially, inter and intra annual and that droughts in terms of rainfall deficits are most common in northern Botswana. Extreme droughts based on low rainfall and soil conditions are most common in south-western Botswana and high rainfall events with risks of floods are most likely in north-eastern Botswana where several large dams are located in this area. Droughts are projected to increase in frequency and severity. Botswana is already witnessing impacts of climate change with constrained agricultural production, increasing food insecurity and increasing water stress, which will worsen with time, as projected.

Prior to the Second National Communication to the United Nations Framework Convention on Climate Change which identified various adaptation measures, the Government of Botswana had initiated strategies to adapt to drought episodes which are cyclical in nature to reduce vulnerability. Consequently, as climatic extreme events are cross-cutting and affecting all economic sectors, the government has adopted a strategy that encompasses all economic sectors with emphasis on the water, health and agriculture (crop and livestock) sectors.

Botswana's adaptation priorities

Climate change adaptation framework in the country is guided and informed by the following documents:

- i. The Second National Communication to the United Nations Framework Convention on Climate Change
- ii. Sustainable Land Management
- iii. National Water Master Plans

In order to ensure that climate change adaptation measures are mainstreamed into national development planning and sectoral planning, the current environmental programmes and projects strategically entail climate change adaptation. For instance, planning within the water sector takes into cognisance the impacts of climate change. Other national initiatives exist such as the on-going Sustainable Land Management in Ngamiland and Central Districts which is aimed at enhancing resilience and reducing the vulnerability of communities to climate change.

The following adaptations actions are currently being implemented by the government nationally to help communities adapt to the impacts for climate change:

Water Sector

- Construction of pipelines and connection to existing ones to transmit water to demand centres

- Reduce water loss during transmission by investing on telemetric monitoring systems
- Enhance conjunctive groundwater-surface water use

Agriculture

- Improve genetic characteristics of the livestock breed such as Musi breed
- Improve livestock diet through supplementary feeding
- A switch to crops with the following traits:
 - Drought resistant,
 - Tolerant to high temperatures
 - Short maturity

Health

- Public education and malaria campaigns
- Malaria Strategy
- Control of Diarrhoeal Diseases



FEDERATIVE REPUBLIC OF BRAZIL
INTENDED NATIONALLY DETERMINED CONTRIBUTION
TOWARDS ACHIEVING THE OBJECTIVE OF THE
UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

Pursuant to decisions 1/CP.19 and 1/CP.20, the Government of the Federative Republic of Brazil is pleased to communicate to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) its intended Nationally Determined Contribution (iNDC) in the context of the negotiations of a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties.

This intended contribution is communicated under the assumption of the adoption of a universal, legally binding instrument that fully respects the principles and provisions of the UNFCCC, in particular the principle of common but differentiated responsibilities and respective capabilities. It is "intended" in the sense that it might be adjusted, as appropriate, before the ratification, acceptance or approval of the Paris agreement in light of provisions yet to be agreed under the ADP mandate.

All policies, measures and actions to implement Brazil's iNDC are carried out under the National Policy on Climate Change (Law 12,187/2009), the Law on the Protection of Native Forests (Law 12,651/2012, hereinafter referred as Forest Code), the Law on the National System of Conservation Units (Law 9,985/2000), related legislation, instruments and planning processes. The Government of Brazil is committed to implementing its iNDC with full respect to human rights, in particular rights of vulnerable communities, indigenous populations, traditional communities and workers in sectors affected by relevant policies and plans, while promoting gender-responsive measures.

Brazil's iNDC has a broad scope including mitigation, adaptation and means of implementation, consistent with the contributions' purpose to achieve the ultimate objective of the Convention, pursuant to decision 1/CP.20, paragraph 9 (Lima Call for Climate Action).

MITIGATION:

Contribution: Brazil intends to commit to reduce greenhouse gas emissions by 37% below 2005 levels in 2025.

Subsequent indicative contribution: reduce greenhouse gas emissions by 43% below 2005 levels in 2030.

Type: absolute target in relation to a base year.

Coverage: 100% of the territory, economy-wide, including CO₂, CH₄, N₂O, perfluorocarbons, hydrofluorocarbons and SF₆.

Reference point: 2005.

Timeframe: single-year target for 2025; indicative values for 2030 for reference purposes only.

Metric: 100 year Global Warming Potential (GWP-100), using IPCC AR5 values.

Methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals: inventory based approach for estimating and accounting anthropogenic greenhouse gas emissions and, as appropriate, removals in accordance with the applicable IPCC guidelines.

This INDC takes into account the role of conservation units and indigenous lands¹ as forest managed areas, in accordance with the applicable IPCC guidelines on the estimation of emission removals.²

Use of markets: Brazil reserves its position in relation to the possible use of any market mechanisms that may be established under the Paris agreement.

Brazil emphasizes that any transfer of units resulting from mitigation outcomes achieved in the Brazilian territory will be subject to prior and formal consent by the Federal Government.

Brazil will not recognize the use by other Parties of any units resulting from mitigation outcomes achieved in the Brazilian territory that have been acquired through any mechanism, instrument or arrangement established outside the Convention, its Kyoto Protocol or its Paris agreement.

ADAPTATION UNDERTAKINGS

Brazil considers adaptation to be a fundamental element of the global effort to tackle climate change and its effects. The implementation of policies and measures to adapt to climate change contributes to building resilience of populations, ecosystems, infrastructure and production systems, by reducing vulnerability and through the provision of ecosystem services.

¹ "Conservation units" refers here only to federal and state level protected areas; "indigenous lands" refers to areas at the minimum in the "delimited" stage in the demarcation processes. Even without the role of these managed areas, Brazil's contribution would still represent a reduction of 31% in 2025 and 37% in 2030 in relation to 2005 levels (GWP-100; IPCC AR5).

² Brazil's Initial National Communication, prior to the applicability of current guidelines, did not consider removals from conservation units and indigenous lands. Such an approach, however, would not be compatible with current guidelines, nor comparable to other Parties' contributions. Disregarding these removals compromised the comparability of the Brazilian initial inventory with other Parties' inventories. Brazil's Second National Communication revised this approach.

The social dimension is at the core of Brazil's adaptation strategy, bearing in mind the need to protect vulnerable populations from the negative effects of climate change and enhance resilience. In this context, Brazil is working on the design of new public policies, through its National Adaptation Plan (NAP), in its final elaboration phase. The strong involvement of stakeholders, at all levels, will contribute to the formulation and implementation of Brazil's NAP.

The NAP aims to implement knowledge management systems, to promote research and technology development for adaptation, to develop processes and tools in support of adaptation actions and strategies, at different levels of government. Brazil is a developing country that experienced a fast urbanization process. In this context, risk areas, housing, basic infrastructure, especially in the areas of health, sanitation and transportation, constitute key areas for adaptation policies. The Government of Brazil gives particular attention to the poorest populations, in terms of improving their housing and living conditions, bolstering their capacity to withstand the effects of severe climate events. Brazil already monitors extreme rainfall events for 888 municipalities and has in place an early warning system and action plans to respond to natural disasters.

It should be further noted that Brazil seeks to enhance its national capacity in water security (National Water Security Plan) and conservation and sustainable use of biodiversity (National Strategic Plan for Protected Areas, as well as the implementation of the Forest Code, particularly concerning protected areas).

The National Adaptation Plan will provide a basis for Brazil to strengthen the country's adaptation capacity, assess climate risks and manage vulnerabilities at the national, state and municipal levels. Through the NAP, Brazil's vision for its adaptation undertakings is to integrate, where appropriate, vulnerabilities and climate risk management into public policies and strategies, as well as to enhance the coherence of national and local development strategies with adaptation measures.

MEANS OF IMPLEMENTATION:

Clarification on the extent to which the contribution is dependent upon international support

This iNDC is presented in accordance with the principles and provisions of the Convention, particularly Article 4, paragraphs 1 and 7, and Article 12, paragraphs 1(b) and 4.

Accordingly, the policies, measures and actions to achieve this contribution will be implemented without prejudice to the use of the financial mechanism of the Convention or of any other modalities of international cooperation and support, with a view to enhance effectiveness and/or anticipate implementation. The implementation of Brazil's iNDC is not contingent upon international support, yet it welcomes support from developed countries with a view to generate global benefits.

Additional actions would demand large-scale increase of international support and investment flows, as well as technology development, deployment, diffusion and transfer.

Specifically concerning the forest sector, the implementation of REDD+ activities and the permanence of results achieved require the provision, on a continuous basis, of adequate and predictable results-based payments in accordance with the relevant COP decisions.³

South-South initiatives

Recognizing the complementary role of South-South cooperation, on the basis of solidarity and common sustainable development priorities, Brazil will undertake best efforts to enhance cooperation initiatives with other developing countries, particularly in the areas of: forest monitoring systems; biofuels capacity-building and technology transfer; low carbon and resilient agriculture; restoration and reforestation activities; management of protected areas; increased resilience through social inclusion and protection programmes; capacity building for national communications and other obligations under the Convention, in particular to Portuguese speaking countries.

Brazil invites developed country Parties and relevant international organizations to further support such initiatives.

³ Recalling that the submission of forest reference emission levels and their corresponding REDD+ results are in the context of results-based payments, in accordance with decisions 13/CP.19 and 14/CP.19. See also documents FCCC/TAR/2014/BRA and FCCC/SBI/ICA/2015/TATR.1/BRA.



FEDERATIVE REPUBLIC OF BRAZIL

ADDITIONAL INFORMATION ON THE INDC FOR CLARIFICATION PURPOSES ONLY

Brazil's iNDC is economy wide and therefore is based on flexible pathways to achieve the 2025 and the 2030 objectives. In that sense, this additional information is meant to be for clarification purposes only.

LONG TERM ASPIRATION

Consistent with the long-term vision of holding the increase in global average temperature below 2°C above pre-industrial levels, Brazil will strive for a transition towards energy systems based on renewable sources and the decarbonization of the global economy by the end of the century, in the context of sustainable development and access to the financial and technological means necessary for this transition.

FAIRNESS AND AMBITION

Brazil is a developing country with several challenges regarding poverty eradication¹, education, public health, employment, housing, infrastructure and energy access. In spite of these challenges, Brazil's current actions in the global effort against climate change represent one of the largest undertakings by any single country to date, having reduced its emissions by 41% (GWP-100; IPCC SAR) in 2012 in relation to 2005 levels.²

Brazil is nevertheless willing to further enhance its contribution towards achieving the objective of the Convention, in the context of sustainable development. Brazil's INDC represents a progression in relation to its current undertakings, in both the type and levels of ambition, while recognizing that emissions will grow to meet social and development needs.

By adopting an economy-wide, absolute mitigation target, Brazil will follow a more stringent modality of contribution, compared to its voluntary actions pre-2020. This contribution is consistent with emission levels of 1.3 GtCO₂e (GWP-100; IPCC AR5) in 2025 and 1.2 GtCO₂e (GWP-100; IPCC AR5) in 2030, corresponding, respectively, to a

¹ Brazil has 15.5 million people living below the poverty line, of which 6.2 million live in extreme poverty (2013). Source: MDS. *Data Social 2.0*. Available at http://aplicacoes.mds.gov.br/sagi-data/METRO/metro.php?p_id=4, accessed on 24 September 2015.

² Source: MCTI. *Estimativas anuais de emissões de gases de efeito estufa no Brasil*. Second edition (2014). Available at http://www.mcti.gov.br/upd_blob/0235/235580.pdf, accessed on 2 September 2015.

reduction of 37% and 43%, based on estimated emission levels of 2.1 GtCO₂e (GWP-100; IPCC AR5) in 2005.

In relation to Brazil's existing national voluntary commitment, which aims to achieve gross emissions³ of approximately 2 GtCO₂e⁴ in 2020, this iNDC represents an additional gross reduction of approximately 19% in 2025. Furthermore, this contribution is consistent with reductions of 6% in 2025 and 16% in 2030 below 1990 levels (1.4 GtCO₂e GWP-100; IPCC AR5).

Brazil's iNDC corresponds to an estimated reduction of 66% in terms of greenhouse gas emissions per unit of GDP (emissions intensity⁵) in 2025 and of 75% in terms of emissions intensity in 2030, both in relation to 2005.⁶

In the period 2004-2012, Brazil's GDP increased by 32%, while emissions dropped 52% (GWP-100; IPCC AR5), delinking economic growth from emission increase over the period, while at the same time Brazil lifted more than 23 million people out of poverty.⁷

Per capita emissions decreased from 14.4 tCO₂e (GWP-100; IPCC AR5) in 2004 to an estimated 6.5 tCO₂e (GWP-100; IPCC AR5) in 2012. At this 2012 level, Brazil's per capita emissions are already equivalent to what some developed countries have considered fair and ambitious for their average per capita emissions by 2030. Brazil's per capita emissions will decline further to an estimated 6.2 tCO₂e (GWP-100; IPCC AR5) in 2025 and 5.4 tCO₂e (GWP-100; IPCC AR5) in 2030 under this contribution.

Brazil will reduce greenhouse gas emissions in the context of continued population⁸ and GDP growth, as well as income per capita increase, making therefore this contribution unequivocally very ambitious.

Brazil's mitigation actions to implement this contribution, including its current undertakings, are consistent with the 2°C temperature goal, in light of IPCC scenarios and national circumstances.

According to the IPCC⁹, global scenarios consistent with a *likely* chance to keep temperature change below 2°C relative to pre-industrial levels are characterized, *inter alia*, by:

- i) sustainable use of bioenergy;
- ii) large-scale measures relating to land use change and forests;

³ Not considering removals.

⁴ Value between 1.977 GtCO₂e and 2.068 GtCO₂e, which represents a reduction between 36.1% and 38.9% below the projected business as usual emissions in 2020, as established by the Decree 7,390/2010 – assuming GWP-100 (IPCC SAR).

⁵ tCO₂e (GWP-100; IPCC AR5)/GDP (1000 US\$₂₀₀₅).

⁶ Source of GDP 2005: Ipeadata. Available at <http://www.ipeadata.gov.br>, accessed on 2 September 2015. Source of estimated GDP 2025 and 2030: Empresa de Pesquisa Energética (EPE). *Nota Técnica DEA 12/14: Cenário econômico 2050*. August 2014.

⁷ Sources for emission reductions: MCTI (op.cit.). Source for GDP: Ipeadata (op.cit.). Source for data on poverty: MDS (op.cit.).

⁸ Brazil's population is projected to continue to grow until the 2040's, to approximately 230 million inhabitants. Source: IBGE.

Projeção da População do Brasil por sexo e idade: 2000-2060. August 2013. Available at http://www.ibge.gov.br/home/estatistica/populacao/projecao_da_populacao/2013/default.shtm, accessed on 2 September 2015.

⁹ IPCC, 2014: Summary for Policymakers. In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwicker and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. SPM 4.1, pp. 10-12.

- iii) tripling to nearly quadrupling the share of zero- and low-carbon energy supply globally by the year 2050.

In this context, Brazil already has one of the largest and most successful biofuel programs to date, including cogeneration of electricity using biomass. Brazil has achieved the most impressive results of any country in reducing emissions from deforestation, mainly by reducing the deforestation rate in the Brazilian Amazonia by 82% between 2004 and 2014. Brazil's energy mix today consists of 40% of renewables (75% of renewables in its electricity supply), which amounts to three times the world average in renewables, and more than four times the OECD average.¹⁰ This already qualifies Brazil as a low carbon economy.

Brazil intends to adopt further measures that are consistent with the 2°C temperature goal, in particular:

- i) increasing the share of sustainable biofuels in the Brazilian energy mix to approximately 18% by 2030, by expanding biofuel consumption, increasing ethanol supply, including by increasing the share of advanced biofuels (second generation), and increasing the share of biodiesel in the diesel mix;

- ii) in land use change and forests:

- strengthening and enforcing the implementation of the Forest Code, at federal, state and municipal levels;
- strengthening policies and measures with a view to achieve, in the Brazilian Amazonia, zero illegal deforestation by 2030 and compensating for greenhouse gas emissions from legal suppression of vegetation by 2030;
- restoring and reforesting 12 million hectares of forests by 2030, for multiple purposes;
- enhancing sustainable native forest management systems, through georeferencing and tracking systems applicable to native forest management, with a view to curbing illegal and unsustainable practices;

- iii) in the energy sector, achieving 45% of renewables in the energy mix by 2030, including:

- expanding the use of renewable energy sources other than hydropower in the total energy mix to between 28% and 33% by 2030;
- expanding the use of non-fossil fuel energy sources domestically, increasing the share of renewables (other than hydropower) in the power supply to at least 23% by 2030, including by raising the share of wind, biomass and solar;
- achieving 10% efficiency gains in the electricity sector by 2030.

In addition, Brazil also intends to:

- iv) in the agriculture sector, strengthen the Low Carbon Emission Agriculture Program (ABC) as the main strategy for sustainable agriculture development, including by restoring an additional 15 million hectares of

¹⁰ Sources: EPE. *Balanço Energético Nacional*. Available at <https://ben.epe.gov.br/>, accessed on 2 September 2015. OECD (2015), Renewable energy (indicator). doi: 10.1787/aac7c3f1-en. Available at <https://data.oecd.org/energy/renewable-energy.htm>, accessed on 2 September 2015.

degraded pasturelands by 2030 and enhancing 5 million hectares of integrated cropland-livestock-forestry systems (ICLFS) by 2030;

- v) in the industry sector, promote new standards of clean technology and further enhance energy efficiency measures and low carbon infrastructure;
- vi) in the transportation sector, further promote efficiency measures, and improve infrastructure for transport and public transportation in urban areas.

Brazil recognizes the importance of the engagement of local governments and of their efforts in combating climate change.

GLOBAL TEMPERATURE POTENTIAL (GTP) METRIC

Brazil notes that, according to the IPCC, "the most appropriate metric and time horizon will depend on which aspects of climate change are considered most important to a particular application. No single metric can accurately compare all consequences of different emissions, and all have limitations and uncertainties".¹¹ The IPCC also states that the *Global Temperature Potential* (GTP) metric is better suited to target-based policies, while the GWP metric is not directly related to a temperature limit such as the 2°C target.¹² Taking this into account, the GTP metric is the most consistent with contributions to hold the increase in global average temperature below 2°C above pre-industrial levels.

With a view to assuring full transparency, clarity and understanding, Brazil decided to communicate this iNDC using GWP-100 (IPCC AR5), prior to COP-21. Consistent with the 2°C temperature goal and in light of science, Brazil is providing estimates to correspond to GTP-100, with IPCC AR5 values.

Brazil's iNDC is consistent with emission levels of 1.0 GtCO_{2e} (GTP-100; IPCC AR5) in 2025 and 0.8 GtCO_{2e} (GTP-100; IPCC AR5) in 2030. This represents reductions of 43% and 52%, respectively, compared to estimated emission levels of 1.7 GtCO_{2e} (GTP-100; IPCC AR5) in 2005. These reductions translate to reductions of 37% and 43% when expressed in GWP-100 (IPCC AR5).

¹¹ IPCC, 2013: Summary for Policymakers. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. SPM D.2 p.15.

¹² See Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: Anthropogenic and Natural Radiative Forcing. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. pp. 710-720.

See also Stocker, T.F., D. Qin, G.-K. Plattner, L.V. Alexander, S.K. Allen, N.L. Bindoff, F.-M. Bréon, J.A. Church, U. Cubasch, S. Emori, P. Forster, P. Friedlingstein, N. Gillett, J.M. Gregory, D.L. Hartmann, E. Jansen, B. Kirtman, R. Knutti, K. Krishna Kumar, P. Lemke, J. Marotzke, V. Masson-Delmotte, G.A. Meehl, I.I. Mokhov, S. Piao, V. Ramaswamy, D. Randall, M. Rhein, M. Rojas, C. Sabine, D. Shindell, L.D. Talley, D.G. Vaughan and S.-P. Xie, 2013: Technical Summary. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. pp. 58-59.

The corresponding estimates on greenhouse gas emissions per unit of GDP (emissions intensity¹³) contained in this iNDC, using GTP-100 (IPCC AR5), are as follows:

Compared to 2005, the estimated reduction in terms of emissions intensity in 2025 is 70% and in 2030 is 79%. This iNDC represents a substantial reduction of 48% in terms of emissions intensity in 2030, compared to 2012 estimates. In the period 2004-2012, Brazil's GDP increased by 32%, while emission levels dropped 61% (GTP-100; IPCC AR5).

Finally, adopting GTP-100 (IPCC AR5), estimates of per capita emissions are as follows:

Per capita emissions decreased from 11.9 tCO_{2e} in 2004 to an estimated 4.3 tCO_{2e} in 2012. Brazil's per capita emissions will decline further to an estimated 4.4 tCO_{2e} in 2025 and to 3.7 tCO_{2e} in 2030 under this iNDC.

The contrast between GTP and GWP estimates sheds light on the importance, for analysis and policy making, of recognizing the predominant role of CO₂ emissions in temperature increase, thus avoiding overestimating of the effects of non-CO₂ greenhouse gases with shorter lifetimes in the atmosphere, in particular methane.

HISTORICAL RESPONSIBILITIES AND EQUITY

Most of the current concentration of greenhouse gases in the atmosphere is a result of emissions since the industrial revolution (the post-1750 period). Current generations are bearing the costs of past interference with the global climate system, resulting from human activities and consequent greenhouse gas emissions, primarily by developed countries, during the last two centuries. Similarly, current human activities around the world will affect the climate system over the next centuries.

In order to build a fair and equitable global response to climate change, it is therefore of central importance to link cause (net anthropogenic greenhouse gas emissions) and effect (temperature increase and global climate change).

The global mean surface temperature increase due to anthropogenic greenhouse gas emissions is an objective criterion to measure climate change, serving the purpose of establishing upper limits to prevent dangerous anthropogenic interference with the climate system.

The specific and relative role of each actor's emissions to global climate change can be determined using the global mean surface temperature as an indicator. Each individual actor's contribution to temperature increase should take into consideration differences in terms of starting points, approaches, economic structures, resource bases, the need to maintain sustainable economic growth, available technologies and other individual circumstances.

Establishing the series, in all sectors, of anthropogenic greenhouse gas emissions by sources and removals by sinks allows the estimation of the relative share of total

¹³ tCO_{2e} (GTP-100; IPCC AR5)/GDP (1000 US\$₂₀₀₅).

temperature increase attributable to an individual country. The relative responsibility of a given country in relation to the global mean surface temperature increase can be estimated with a high level of confidence. Hence, the marginal relative contribution to the global average surface temperature increase is a relevant measure to evaluate responsibility in the global effort to limit temperature increase to 2°C compared to pre-industrial levels.

Brazil's mitigation efforts are of a type, scope and scale at least equivalent to the iNDCs of those developed countries most responsible for climate change. In view of the above, and based on available tools, it is evident that Brazil's iNDC, while consistent with its national circumstances and capabilities, is far more ambitious than what would correspond to Brazil's marginal relative responsibility for the global average temperature increase.



Brunei Darussalam's Intended Nationally Determined Contribution (INDC)

November 2015



Ministry of Development
Jalan Lapangan Terbang Lama Berakas
Bandar Seri Begawan
BB3510, Brunei Darussalam

30 November 2015

Dear Executive Secretary,

Subject: Brunei Darussalam's Intended Nationally Determined Contribution (INDC)

Brunei Darussalam recognises the need for respecting the principles of the United Nations Framework Convention on Climate Change (UNFCCC). In response to the 'Lima Call for Action'¹, the Ministry of Development, in its capacity as Brunei Darussalam's national focal point to the UNFCCC is pleased to present its Intended Nationally Determined Contribution (INDC), ahead of COP 21 in Paris, December 2015².

Our INDC is aligned with national development priorities and includes both adaptation and mitigation actions based on national circumstances; it has been developed from existing action plans and strategies. Brunei Darussalam's INDC is composed of six sections:

- Section 1: National circumstances, presenting national context relevant to the INDC
- Section 2: Mitigation contribution, highlighting the actions Brunei Darussalam is and could be undertaking to reduce greenhouse gas emissions, with information to ensure clarity, transparency and understanding of the activities being proposed
- Section 3: Adaptation contribution, covering Brunei Darussalam's vulnerability to climate change and prioritised adaptation actions
- Section 4: Fairness and ambition, outlining how Brunei Darussalam's contributions are rational in a global context
- Section 5: Planning for implementation, highlighting the policies, strategies, institutions and plans that will support the implementation of the INDC
- Section 6: Means for implementation, which assess the support Brunei Darussalam's needs to implement the INDC.

Through "bottom up" assessments to address climate change, such as INDCs, Brunei Darussalam is confident that a new and ambitious agreements can be negotiated and finalised at COP 21 in Paris this year. This agreement is essential to successfully limit temperatures to a level that would prevent dangerous anthropogenic interference with the global climate system, and at the same time contribute to global poverty reduction and promote economic growth efforts.

Yours sincerely,

Dato Paduka Awang Haji Bahrin bin Abdullah,
Minister of Development
Brunei Darussalam

¹ Decision 1/CP.20 -

https://unfccc.int/files/meetings/lima_dec_2014/application/pdf/auv_cop20_lima_call_for_climate_action.pdf

² Brunei Darussalam reserves the right to make revisions to this document, as the country continues along its development pathway.



Brunei Darussalam's Intended Nationally Determined Contribution (INDC)

1 National circumstances

For over a decade, Brunei Darussalam has represented stability and continuity in a region subject to rapid social, economic and climate change. At the same time, under the leadership of His Majesty Sultan Haji Hassanal Bolkiah, the Sultan and Yang Di- Pertuan of Negara Brunei Darussalam, the country continues to enhance global partnership and to collaborate closely with partners in the Association of Southeast Asian Nations (ASEAN) and internationally on areas of mutual interest including in the field of environment and energy. To highlight its commitment to this cause, His Majesty announced at the UN Climate Summit on 23rd September 2014:

“Brunei Darussalam is targeting a 63% reduction in our total energy consumption by 2035. We [Brunei Darussalam] aim to achieve this by reducing fossil fuel demand for inland energy use, and through a revised power tariff that encourages energy savings. As of 2013, Brunei Darussalam has managed to attain an average reduction in energy consumption of 13.9%. My Government also further aspires to generate at least 10% of total power from new and renewable resources by 2035.

For the past 80 years, forest conservation has been an important part of our national development strategy. Today, 75% of Brunei Darussalam's land area is covered by tropical rainforests comprised of highly diverse ecosystems. In addition, Borneo's pristine peat swamps forests, which act as a carbon sink to counter emissions, are acknowledged by scientists as being some of the only remaining examples of their kind in the world. Our commitment to preserving our environment is further reflected through the allocation of 58% of our land area to the “Heart of Borneo” forest conservation initiative. We continue to work with our neighbours, Indonesia and Malaysia, and other international partners such as the World Wildlife Fund (WWF) in this endeavour.”

Brunei Darussalam is in the process of developing its Initial National Communication (INC). As part of the preparation of the INC, a Greenhouse Gas (GHG) emissions inventory is also being developed which will outline the GHG emissions arising from different sources and sectors. The draft INC estimates that in 2010 Brunei Darussalam's GHG emissions were approximately 10.02 million tonnes of CO₂ equivalent (Mt CO_{2eq}). It is also estimated that land-use change and forestry (LUCF) contributes to the removal of 2.63 million tonnes equivalent CO₂ sequestration. The net GHG emissions were approximately 7.40 million tonnes of CO₂ equivalent. This total represents a small fraction of global emissions; approximately 0.016%³ of global emissions in 2010.

The GHG emissions arising in Brunei Darussalam are dominated by sources in the energy sector. Electricity generation is the largest source of GHG emissions. Currently, around 99% of the country's electricity is generated from natural gas⁴, of which the majority comes from open cycle power plants. Preliminary estimates show that in 2010, emissions from these plants were approximately 4.18 Mt CO_{2eq}. Energy production, including the production of oil and gas for domestic and exports markets, is another important source. Emissions from this sector were estimated to be 3.31 Mt CO_{2eq}, in 2010. GHG emissions also arise from the direct combustion of fossil fuels in end-use sectors. Of these sources, fuel consumption in transport is responsible for approximately 1.17 Mt CO_{2eq}, with emissions from energy consumption in industry responsible for 0.45 Mt CO_{2eq}. Combustion emissions from the residential and other sectors represent less than 0.39 Mt CO_{2eq}.

³ Calculated based on Brunei Darussalam's 2010 net total emissions and CAIT Climate Data Explorer 2010 global estimated emissions

⁴ International Energy Agency (2012) Brunei Electricity and Heat for 2012.

<http://www.iea.org/statistics/statisticssearch/report/country=BRUNEI&product=electricityandheat&year=2012.2015> (Accessed on 18/09/2015)



Other emissions sources, including emissions from waste management, agriculture and industrial processes, overall represent less than 0.53 Mt CO_{2eq} in 2010. These other sources are therefore small in comparison to the emissions from the energy sector.

Brunei Darussalam's planned mitigation efforts are focused primarily on energy related policies and actions, promoting energy efficiency and conservation and renewable energy as examples.

The energy sector is a core element of the economy as it accounts for more than 60% of Brunei Darussalam's GDP. To drive the economy into a sustainable future, the Government of Brunei Darussalam has recognised the need for the implementation of strategies related to energy security, diversification of supply, energy efficiency and conservation. The introduction of the Energy White Paper in 2014 highlights the roadmap the country is taking in exploring strategies to diversify the energy mix through a concerted effort to promote the use of alternative and renewable energy sources for power generation.

Promoting sustainability within the current economy is also a priority for the Government of Brunei Darussalam. It is working with the hydrocarbon industry, which is a major source of GHG emissions, to limit its direct impacts whilst also maximising its wider environmental benefits. For example, the industry provides funding of forestry projects, such as increasing tree plantation for carbon sequestration, forestry protection initiatives and for awareness raising campaigns. The Government of Brunei Darussalam is actively pursuing integrated approaches such as this amongst departments to achieve national goals. This approach is further re-enforced by strong "top-down" support from His Majesty in many areas of the economy, and through "bottom up" approaches to activities such as awareness raising on climate change in schools and communities.

The Government of Brunei Darussalam also recognises the need for a more balanced economy; identifying growth areas in the country to promote the development of other sectors in addition to energy. These include the financial and service industries, which will diversify the economy to ensure future economic stability.

Brunei Darussalam has also adopted the national vision of "Wawasan Brunei 2035", which aims to make the nation widely recognised for its educated and highly skilled people as measured by the highest international standards; achieving and maintaining quality of life among the top 10 nations in the world; and operating under a dynamic and sustainable economy with income per capita within the top 10 countries of the world. In order to achieve the three goals, the Government of Brunei Darussalam has identified eight strategies to ensure all aspects of development are implemented systematically and effectively. Recognising the importance of the environment to its future development, a dedicated environmental strategy has been developed with the aim to: (i) reduce environmental pollution to a minimum; (ii) prevent the possible deterioration of the country's natural ecosystem; and (iii) preserve the country's biodiversity. Sectoral strategies have also been developed in line with the national vision, to promote a more sustainable and efficient economy in the country. All in all, our Vision 2035's priority is to safeguard the welfare of our people and its plan includes ensuring a clean, green and healthy environment for every citizen.

Brunei Darussalam is vulnerable to the impacts of climate change. It has a tropical climate, experiencing year-round high temperatures, high rainfall and high humidity. Vulnerability assessments show that the country has medium to high climate change exposure, mainly due to higher temperatures during the months of April- May-June, the hottest months (and potential for heat-related stress), and higher rainfall intensities during the wet season. Brunei Darussalam is exposed to flooding incidences particularly in low lying areas; heat stress and transboundary haze pollution arising from forest fires in neighbouring countries during dry season. Sea level rise is also of concern, given some areas of the country are up to 12 meters below sea level.

The country's estimated population in 2014 was 411,900 and it is projected to reach approximately 650,000 people by 2035, a 58% increase compared to the population in 2014. Climate change stresses on the population are a concern to the Government of Brunei Darussalam as part of its mandate is to ensure the highest quality of life for its people, which encapsulates protecting their living and surrounding environment. Appreciating the risk the country is under, Brunei Darussalam has recently taken part in a Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) climate change vulnerability study, with the aim to attain self-sufficiency in food and security of energy and water resources.



The Government of Brunei Darussalam has also developed plans addressing the adverse impacts of unusual and extreme weather and climate events. These together with the vulnerability study, provide the starting point for a National Adaptation Plan (NAP).

2 Mitigation Contribution

Brunei Darussalam's economy benefits from the revenues from the extraction, refining and export of its oil and gas reserves. Given that the energy sector is the dominant sector with respect to GDP and GHG emissions generated. The country's first intended mitigation contribution concerns actions primarily within the energy sector. However, this does not preclude its intention to reduce and report on emissions as a result of actions in other sectors which will result in carbon sequestration, i.e. in the forestry sector. Further, there are a number of measures which have been identified for future research and development whose contribution to meeting overall targets has not yet been quantified, but are anticipated to lead to significant mitigation impacts in the coming decades.

Brunei Darussalam's Intended Nationally Determined Contributions are summarised as follows:

- i. **Energy sector:** to reduce **total energy consumption by 63% by 2035** compared to a Business-As-Usual (BAU) scenario; and to increase the **share of renewables** so that 10% of the total power generation is sourced from renewable energy by 2035
- ii. **Land Transport sector:** to reduce **carbon dioxide emissions from morning peak hour vehicle use by 40% by 2035** compared to a business as usual scenario.
- iii. **Forestry sector:** to increase the total gazetted **forest reserves to 55% of total land area**, compared to the current levels of 41%.

2.1 Energy Contribution

Brunei Darussalam has an aspirational target to reduce total energy consumption by 63% by 2035 from a Business-As-Usual (BAU) scenario. This will be achieved by implementing policies and actions in a number of areas which are outlined in the following sections, and by further research, development and capacity building in areas where the magnitude of possible climate change mitigation benefits have yet to be determined.

2.1.1 Reduction of Energy Intensity Across all Economic Sectors

A reduction of 45% in energy intensity is measured as a 45% reduction in tonnes of oil equivalent per unit of gross domestic product, using 2005 as a base year. This will be achieved by implementing a number of measures including:

Policies and regulatory frameworks for energy efficiency and conservation:

- i. Electricity Tariff Reform
- ii. Energy Efficiency and Conservation Building Guidelines for Non-Residential Sector
- iii. Standards and Energy Labelling for Products and Appliances
- iv. Energy Management Policy
- v. Fuel Economy Regulation
- vi. Financial Incentives
- vii. Awareness Raising

Project based energy efficiency measures such as the increased use of energy efficient streetlights. This involves replacement of the existing high pressure sodium vapour street lighting to low wattage and superior technology lighting to increase standards nationwide.

For more information on the implementation plans to achieve energy intensity reduction goals, please refer to Section 5.



2.1.2 Increasing the share of Renewable Energy in the national total power generation mix

Increasing the share of renewables so that 10% of the total power generation is sourced from renewable energy by 2035 which will be achieved through measures such as:

- i. **Increasing the use of solar power** as a renewable resource. To this end a three year study from 2010-2012 was carried out on six types of solar cells at the Tenaga Suria Solar Power Plant (a solar demonstration project) to increase technical capacity for deploying solar resources in future
- ii. **Utilising the 10-15 MW potential of waste to energy resources** that have already been identified in the Energy White Paper.

For more information on the implementation plans to achieve this goal, please refer to Section 5.

2.1.3 Land Transport

In 2014, Brunei Darussalam published its Land Transport Master Plan (LTMP); based on a comprehensive assessment of the country's current land transport situation. A variety of forecasts and mitigation scenarios were explored; however the preferred scenario, and that most in line with the Wawasan Brunei 2035 national vision, entails a 40% reduction in morning peak hour carbon dioxide emissions against a BAU scenario in 2035. With no action, the BAU scenario represents a 178% net increase in GHG emissions over 2012 levels. However in implementing the preferred scenario, this will limit the net increase in emissions in 2035 to 67% over 2012 levels.

In order to achieve this scenario, as well as various other transport policy objectives, the Land Transport White Paper sets out a total of 38 transport policy recommendations, some of which are immediately relevant to GHG mitigation, such as implementing fuel standards or promoting electric and hybrid vehicles. For more information on the policy plans, please refer to Section 5.

2.2 Mitigation Contributions from the Forestry and Land Use Sectors

Brunei Darussalam is considered one of the world's leading nations in terms of its actions to preserve forest cover, with currently approximately 75% of its 5,765 square kilometres national land area is under forest cover. It is comprised of what experts believe to be the oldest tropical rainforest ecosystem in the world, but also mangroves, peat swamps and other areas which sequester carbon dioxide from the atmosphere.

Approximately 41% of the country's land area have been gazetted as forest reserves. These forest reserves are protected by robust legislation. The Government of Brunei Darussalam intends to increase the total gazette forest reserves to 55%, and has already commenced working with the relevant authorities to increase the area. The decision to ban logging concessions from nationally designated forest reserves has also been implemented. Restricted and controlled logging will only be allowed in designated Inter Riverine Zones (IRZ), a small area of land which has been strictly regulated by volume quotas to manage activity in the region. IRZ areas in the country are small areas, totalling 50,000 hectares, of which logging and forest plantation can only take place in a designated area of 30,000 hectares.

Brunei Darussalam is also a key member of the "Heart of Borneo" Initiative, a trilateral forest conservation agreement signed with Malaysia and Indonesia to preserve and protect its remaining unique ecosystems. The initiative will further ensure the best sustainable forestry practices in the country.

2.3 Other mitigation measures

The Government of Brunei Darussalam has developed building guidelines; all buildings including commercial and housing estates, industrial and government buildings are required to set aside or to retain 10% of the land as open space or green area.

Studies are being undertaken to identify measures to reduce flaring and venting during gas extraction, which in turn will reduce emissions of methane and carbon dioxide. Gas flaring and venting also wastes valuable energy resources that could be used to support economic growth.



3 Adaptation Contribution

One of the principal goals of Wawasan Brunei 2035 is to protect its people and their future livelihoods; enhancing climate resilience and adapting to climate change plays a major role in achieving this. Protecting both terrestrial and marine biodiversity of the country's ecosystem is also a priority for the Government of Brunei Darussalam, as demonstrated by its integration into national development plans.

3.1 Climate related risks

Flooding is one of the major climate related risks and causes the most significant climate impacts in Brunei Darussalam. In January 2015, as an example, heavy rainfall coinciding with a high tide caused widespread disruption and damage to transport links such as bridges, river navigation as well as on residential assets.

The available climate projections suggest that the country needs to prepare for significant changes in the future. The mean surface temperature is expected to increase by 2-3 °C between 2031 and 2060 and by 3-4°C between 2071 and 2100⁵. Increased heat stress could result in extreme drought events and a higher risk of water scarcity, along with adversely affecting the health of workers and increasing the occurrence of forest fires. Regarding precipitation, the uncertainty is larger and some long-term projections show a drier February-March season and a wetter April-May-June season. Therefore flooding and increased heat stress are expected to be the major hazards that require integrated adaptation planning and implementation of actions to ensure that the development vision of the country will be achieved.

3.2 Priority sectors

Brunei Darussalam has identified the following sectors for priorities for further climate change adaptation actions:

- i. Biodiversity
- ii. Forestry
- iii. Coastal and flood protection
- iv. Health
- v. Agriculture
- vi. Fisheries.

Climate change adaptation is currently most advanced in the biodiversity and forestry sectors. The key achievements and principles are explored below.

3.2.1 Biodiversity sector

Brunei Darussalam's highly diverse ecosystems are considered among the most significant hotspots in the world. It has already undertaken climate change adaptation actions which demonstrate its commitment to protect its people and the very unique biodiversity the country is home to, such as:

- i. Participating in the "Heart of Borneo" Initiative. Borneo's tropical rainforests stretch from north to south and are understood to be one of the world's oldest tropical rainforest ecosystems. The initiative builds on five pillars: trans-boundary management; protected area management and sustainable natural resource management, ecotourism development and capacity building.
- ii. Development of the National Biological Resources (biodiversity) Policy and Strategic Plan of Action (2012). The plan outlines the strategic objectives and actions to conserve the biodiversity.
- iii. Ratification of the Convention of Biological Diversity of the United Nations. Brunei Darussalam will be hosting the second Asia Pacific Rainforest Summit in 2016.
- iv. Designation of 150,000 hectares of Marine Protected Area (MPA) under the Fisheries Act (1972); the aim of the act is to protect and conserve the marine ecosystem within the coral reef. The coral reef has the ability to sequester the atmospheric carbon therefore this policy also provides a co-benefit for climate change mitigation.

⁵ Meteorological Service Singapore and Met Office Hadley Centre (2014). A Regional Climate Modelling Experiment for South East Asia. Available at: <http://ccrs.weather.gov.sg/wp-content/uploads/2015/03/Regional-Climite-Modelling-Experiment-for-Southeast-Asia.pdf>



- v. Establishment of the Tropical Biodiversity Centre whose goal is to promote the development of a local biotechnology industry based on the country's forest biodiversity resource. This is an example of a fruitful collaboration between research institutes and government departments.

3.2.2 Forestry sector

In addition to the unique biodiversity some forest types provide flood protection, slope stability and support fresh water supply. The ground level in Brunei Darussalam is below sea level (up to 12 meters in some places) and the peat that accumulates in forest floors raises the ground level. However, if the trees are cut down in peat swamp forests (PSFs) the peat will speed up the drying process, increasing the likelihood of flooding due to increase surface run off and making forests more prone to forest fires. This could result in lower ground levels and contaminated fresh water supply in rivers as seawater encroaches. This could consequently have adverse effect on the Brunei Darussalam's economy as the oil and gas industry relies on fresh water supply from the rivers.

The activities that Brunei Darussalam is undertaking to protect forests, including both 'bottom up' and 'top down' approaches are already moving in the right direction for integrating climate change and providing co-benefits for climate change adaptation.

"Top-down" approaches include legislation and regulations in the land use sector, such as restrictions and reduced-scale on logging activities which include limiting tree numbers to be cut in designated zones, the height of those trees and setting a minimum distance from a river where trees can be felled (which provides protection against flooding due to preserving soil quality around the rivers). The authorities carry out aerial monitoring as well as planned and random forest patrols, in addition to dedicated border inspections.

"Bottom-up" approaches include:

- i. Awareness raising activities such campaigns in schools and communities, along with initiatives like "International Day of Forests"
- ii. The Universiti Brunei Darussalam conduct and undertake research projects on biodiversity in climate change, as well as through its collaboration with renowned international universities under International Consortium of Universities for the Study of Biodiversity and the Environment (iCUBE).⁶
- iii. The oil and gas industry also support research and development projects in carbon sequestration and fund some conservation projects.

Finally, the forestry sector provides opportunities for both adaptation and mitigation. As explained above actions to preserve the forest provide flood management benefits (adaptation) and where this is coupled with reforestation or afforestation to expand the forests reserves area, there could be enhanced mitigation benefits too.

3.2.3 Coastal and flood protection

Regarding flood protection, an integrated approach combining flood protection, river quality improvement and coastal protection has been initiated by The Government of Brunei Darussalam to implement both structural measures (such as flood walls, drainage improvement, and energy efficient pumping stations) and non-structural measures (such as land use planning, capacity building, collaboration across sectors and research institutes). It also intends to share knowledge and mobilise stakeholders, not only within its government departments, but also including schools, communities, remote villages and the private sector.

3.2.4 Other sectors

Further work will be carried out to assess the health impacts of climate change on Brunei Darussalam, as well as impacts on agriculture and fisheries.

⁶ iCUBE aims to cooperate with international universities in research, teaching and learning on issues related to biodiversity, climate change and the environment. Its members comprised of King's College London-Korea University, Monash University, National University of Singapore, Universiti Brunei Darussalam, University of Auckland, University of Bonn, and University of North Carolina. UBD is the secretariat for the iCUBE project.



3.3 Strengthening of adaption planning

Brunei Darussalam will continue to strengthen its adaptation efforts by:

- i. promoting the mainstreaming of sectoral adaptation plans into a national holistic and coordinated plan;
- ii. promoting the collaboration of multiple stakeholders and expertise across the sectors and society in general;
- iii. increasing the development and use of tailored data and information systems; and
- iv. establishing and promoting the appropriate legislative framework.

For example the Department of Drainage and Sewerage will implement the flood monitoring information system and the Department of Forestry is planning to undertake an updated forest inventory.

4 Fairness and ambition of the contribution

Although Brunei Darussalam's total GHG emissions share of global emissions is very small (0.016%), it is highly vulnerable to the adverse impacts of climate change. It recognises the importance for all countries to present fair and ambitious INDCs, and acknowledges the objectives laid out in the Lima Call for Action.

This document marks Brunei Darussalam's first presentation of mitigation contributions to limit growth in GHG emissions, to the UNFCCC. In developing the INDC, consideration has been given to Article 4.8 and 4.10 of the Convention; recognising Brunei Darussalam's economy is heavily dependent on income generated from the production, processing and export of fossil fuels. Nevertheless, the contributions that have been identified in this INDC are ambitious and highlight significant progression beyond historic and current undertakings. Delivery of the contributions will require major investments in new technologies, such as the promotion of renewable energy technologies that are not currently cost-competitive with fossil plant in Brunei Darussalam's, as well as changes in consumption behaviours of end-users. The main focus of the mitigation actions are currently on the energy sector, the largest sector in the country's economy; however equally ambitious targets have also been presented for the forestry - including increasing the already large areas of protected forest cover - highlighting the Government of Brunei Darussalam's clear objective to limit its net GHG emissions.

As Brunei Darussalam's first National Communication and GHG emissions inventory are currently under development, quantified GHG reduction targets (or contributions) have not been provided in this version of the INDC. Brunei Darussalam therefore reserves the right to update its INDC as more data becomes available.

5 Planning for Implementation

The production of Brunei Darussalam's INDC is a nationally led process, co-ordinated by the Ministry of Development. In order to successfully deliver on the contributions outlined in this INDC a number of steps have already been taken:

- i. Brunei Darussalam's Initial National Communication and GHG inventory is being drafted. This is the country's first GHG inventory which will give the first accurate estimation of sectoral GHG emissions and will assist with policy development, along with international reporting requirements (e.g. BURs);
- ii. Brunei Darussalam established the Brunei National Energy Research Institute (BNERI) in 2011 to assist with the formulation of energy policy;
- iii. Brunei Darussalam's National Disaster Management Centre (NDMC) has developed a Strategic National Action Plan for Disaster Risk Reduction, along with the private sector, non-governmental organisations, local bodies and other national agencies, to ensure a safer and disaster resilient country and community;
- iv. Sectoral adaption plans currently exist; with further effort these can be developed into a national integrated and coordinated adaptation plan;
- v. Brunei Darussalam is and will continue to participate in regional networks, such as the ASEAN forum to strengthen regional collaboration efforts, research studies on climate change and its impacts on



ASEAN countries' biodiversity, and organised future activities on "Green themes". This will help the nation to better understand future climate risks and play an active role in co-ordinated regional actions such as the Heart of Borneo Initiative;

- vi. In terms of flood mitigation, river quality improvement and coastal protection the Government of Brunei Darussalam has outlined an action plan comprised of both structural (physical defences) and non-structural (institutional) measures that are currently being and will be implemented in Brunei Darussalam;
- vii. The Government of Brunei Darussalam will continue to promote inter-ministerial and inter-departmental co-ordination and collaboration to achieve goals with respect to forestry protection and its associated adaptation benefits. Already for example, revenue generated by the energy sector has financially supported:
 - a. The development of the setup of the project implementation framework of the Heart of Borneo Initiative
 - b. The project "Biodiversity Action Plan for Peat Swamp Forest"
- viii. Other areas identified where an integrated approach will be pursued is in the fight against diseases, the incidence of which may be increased due to climate change; and
- ix. With current limitations on land space for agriculture, the Government of Brunei Darussalam recognises the need to have more efficient agriculture production to meet the increasing demand and to ensure that the crops are resilient to withstand the future impacts of climate change, such as temperature increases and higher risk of flooding.

5.1 Implementing Energy Related Measures

The following sections highlight more specific implementation actions in existing strategies for the energy and transport sector, as previously outlined in Section 2.

5.1.1 Development and Implementation of EEC Legislative Measures

Seven key policies have been identified which need to be developed and implemented between now and 2035:

i. *Electricity Tariff Reform*

In January 2012, the implementation of a new progressive electricity tariff structure for the residential sector was introduced. This was followed by the replacement of post-paid to pre-paid meters as a way of encouraging energy saving by the public. The new tariff structure is a more progressive way of billing and aims to integrate an element of energy saving into the public's consumption habits

ii. *EEC Building Guidelines for Non-Residential Sector*

The Ministry of Development in collaboration with the Energy Department Prime Minister's Office have developed EEC Building Guidelines for non-residential buildings which established energy efficiency and conservation standards, and a regulatory mechanism for buildings in Brunei Darussalam. The EEC Building Guidelines are mandatory to all government buildings and voluntary to all commercial buildings at present. It is intended that they will become mandatory for all buildings in the next phases of policy roll-out. The guidelines were launched by the Minister of Development in May 2015.

The Green Buildings Initiative takes forward a number of actions which support the implementation of the policy. The following actions have already been undertaken or are currently being phased into practice:

- a. A green building rating system which is being developed for government and commercial buildings with the aim to give transparency on the energy performance of buildings.
- b. Pilot energy audits are being undertaken some government buildings to identify 'no cost', 'low cost' and 'high cost' efficiency savings. All no and low cost measures are being implemented, such as reducing the operating hours of centralised air conditioning to be in line with office working hours, setting a minimum temperature of 23°C, and the replacement of inefficient lighting with energy efficient technology. The Government of Brunei Darussalam aims to roll out building energy audits across other governmental, commercial and



residential buildings in future. The anticipated energy savings as a result of these and other measures is anticipated to lead to an overall reduction in energy consumption in government buildings of up to 50% against previous years' performance.

- c. An energy consumption building index which will define a maximum energy consumption target for buildings is currently being developed.
- d. Public houses under the National Housing Programme are designed with green building features that make possible saving in water and energy consumption as well as rain harvesting. This coupled with provision of environmentally friendly and zero carbon modes of mobility (pedestrian and cycling networks) in housing areas enable convenient access to facilities and amenities as well reduce carbon emissions. These houses are targeted to meet the internationally recognized Building and Construction Authority (BCA) Green Mark standard.

iii. Standards and Energy Labelling for Products and Appliances

The Energy Department Prime Minister's Office in collaboration with the Brunei National Energy Research Institute is currently developing the Standards and Labelling Order for electrical appliances. The objective is to restrict and potentially halt the import of the non-efficient electrical appliances and products in future, while concurrently educating and encouraging the public to purchase more energy-efficient electrical appliances and products. The next step is to organise a series of public consultations and roadshows to determine the potential financial incentives that could be provided by the Government of Brunei Darussalam to expedite market transformation once the Order has been endorsed. The Order is expected to be implemented in late 2016

iv. Energy Management Policy

Brunei Darussalam is considering adopting an Energy Management System that is compatible with the ISO 50001. Equipment such as demand controllers, Building Automation Systems (BAS) and Building Energy Management Systems (BEMS) have the potential to support energy management initiatives. This aspect of energy policy is planned to be developed in late 2015 and 2016, and expected to be implemented by 2018

v. Fuel Economy Regulation

A transport fuel economy regulation is currently under development in Brunei Darussalam to improve the emissions performances of vehicles on the road. The Government of Brunei Darussalam is considering setting fuel consumption targets for new vehicles that are similar to those in the EU, such as 17.2 kilometre/litre by 2020 (EU 2016 target equivalent) and at 21.3 kilometre/litre by 2025 (EU 2020 target equivalent). Technologies such as electric, hybrid and more fuel-efficient conventional engine vehicles are also being promoted

vi. Financial Incentives

The Energy Department Prime Minister's Office in association with the Ministry of Finance will identify suitable financial incentives which can be introduced. These may be in the form of tax exemptions, tax reductions or rebate schemes on energy-efficient appliances and products. This aim of the financial support is to address the increased capital cost that may be incurred when purchasing more energy efficient equipment. The Energy Department Prime Minister's Office and Ministry of Communication are also exploring several options to provide appropriate financial incentives in the transportation sector, in particular for hybrid cars and fuel-efficient vehicles

vii. Awareness Raising

The Energy Department Prime Minister's Office, in collaboration with the Ministry of Education's Science, Technology and Environment Partnership (STEP) Centre, will continue to expand Energy Clubs with EEC priorities at schools and hold an annual Energy Week to share with the public the latest developments on best practices in EEC for Brunei Darussalam. The Energy Department Prime Minister's Office also periodically conducts a seminars on energy savings for newly appointed government officers and staff organised by the Public Service Institute, Prime Minister's Office. The



seminars on energy saving are also planned to be extended to rural communities so that they will be given an equal opportunity to learn about EEC

5.1.2 Power Efficiency Improvement

Improving the overall existing power generation efficiency to greater than 45% by 2020, will be brought about by replacing traditional open cycle power plants with more efficient combined-cycle or combined heat and power plants. Further, a structured maintenance programme will be put into place to minimise system losses.

5.1.3 Deployment of Renewable Energy

While efforts are being made to improve efficiency in electricity usage, the Energy Department Prime Minister's Office has also taken steps and will continue to put emphasis on the introduction of alternative and renewable energy sources into the electricity generation mix for Brunei Darussalam. The use of renewable energy for generation will offset the use of fossil fuels required to generate the same amount of electricity at conventional fossil fuel power plants.

Brunei Darussalam commissioned its first photovoltaic solar power plant, the Tenaga Suria Brunei (TSB) in Seria in 2010. At 1.2 MW capacity, it is generating approximately 1,600MWh per year and is an important first step in the development of renewable energy sources in the country, where experience of renewable technologies is currently limited.

In addition to solar power, the Energy Department Prime Minister's Office in collaboration with other government and non-government agencies are also investigating the feasibility of a waste-to-energy facility at Sungai Paku. This facility is expected to generate up to 10-15 MW of power from municipal solid waste, which will also result in a reduction in GHG emissions.

Other alternative energy sources such as wind power, hydropower and tidal power are currently being researched by the Government of Brunei Darussalam. Further development will potentially make the technology more economically and technically feasible in the medium and long-term, supporting the Government of Brunei Darussalam's goal to increase the share of renewables so that 10% of the total power generation is sourced from renewable energy by 2035.

5.2 Implementing Transport Related Measures

As outlined in Section 2, the Government of Brunei Darussalam commissioned a detailed Land Transport Master Plan (LTMP), including background studies on current land transport use, based on which a Land Transport White Paper was drafted.

Brunei Darussalam currently has a high level of vehicle ownership and usage; ownership levels were 0.68 vehicles per capita in 2014. As outlined in the Transport White Paper, under a scenario in which the growth in private transport is left unmitigated, private car traffic is projected to increase rapidly over the next 20 years. The increase will be driven by the anticipated growth in population and levels of car usage. This is expected to create significant congestion issues, and result in rapidly increasing journey times and a 6-fold increase in the share of public roads that are 'over capacity' at peak times by 2025. In order to achieve the scenario of a 40% reduction in morning peak hour carbon dioxide emissions against the BAU scenario in 2035 (see section 2.1.3), the Land Transport Master Plan (LTMP), outlines a number of policies that are being implemented to increase the share of public transport journeys as a percentage of total journeys from its current level of approximately 1% to 22% by 2035. Measures include expanding the bus fleet from 105 to 275 buses, creating a national school bus system, creating separate bus rapid transit (BRT) infrastructure in four corridors from 2017 onwards, and further increasing the capacity by 2035. Such measures will also have the effect of reducing GHG emissions from the use of motorised vehicles.

As current walking and cycling infrastructure is fragmented, more integrated walking and cycling networks are planned for Bandar Seri Begawan and other areas. Moreover, an Urban Smart Travel Zone is proposed for the capital city Bandar Seri Begawan under the LTMP, which is designed to reallocate road space towards public transport and active travel modes. Improved parking policies and intelligent transport systems (ITS) also form part of the suggested policy package, in order to manage traffic demand and improve traffic



flow. The LTMP also suggests a review of the Government of Brunei Darussalam's fuel subsidies as a means of managing the increase in road traffic. The Government of Brunei Darussalam's White Paper recommends that as a minimum, demand management policies should include "a focus on parking management, land-transport integration, investment in public transport, and physical/regulatory regulation of access to urban centres and other sensitive locations".

As outlined in the 'Implementing Energy Related Measures' section, fuel economy regulations are being developed so the transport sector can contribute to the overall reduction of energy intensity targets. This is a joint policy action led by the Energy Department Prime Minister's Office with support from the Ministry of Communication in its implementation. As described in the Transport White Paper, there is an overall goal to introduce policies to promote the use of more efficient "green" vehicles such as hybrid and electric vehicles which will go some way towards achieving these targets. This initiative is being carried out in association with the Energy Department Prime Minister's Office, demonstrating cross-departmental co-operation.

6 Means of implementation

Brunei Darussalam intends to implement its mitigation contributions identified in its INDC through domestic efforts. However, in order to do so successfully, the country will have to address and overcome a number of challenges. To support the implementation Brunei Darussalam will continue to collaborate with its partners at sub-regional, regional and international level to enhance its capability and capacity towards achieving its climate mitigation and adaption objectives:

- i. Wawasan Brunei 2035 highlights the need for the legislative framework in Brunei Darussalam to be developed to address the cross-sectoral environmental challenges including climate change mitigation and adaptation.
- ii. Closer co-ordination amongst stakeholders to avoid duplication and synergise efforts. Defining roles and responsibilities around flood risk assessment, as an example, will lead to more effective and efficient policy decisions in this area. This integration and collaboration between different stakeholders will allow for the sharing of knowledge lessons learnt and expertise to ensure a more comprehensive and effective plan is developed. Improved coordination can also address data gaps; closer and defined working relationships will help streamline data collection process to ensure reliable, accurate information is being captured (especially for GHG inventory purposes).
- iii. To put in place a comprehensive monitoring system for gathering information on pollution and environmental quality. Once in place, this could be built upon to monitor and report against climate change targets i.e. to facilitate the collation of baseline data and evaluate the effectiveness of spending on climate related policies and actions.
- iv. A lack of a national GHG inventory from which to draw a common source of data is a significant technical barrier to addressing climate change. Improved access to baseline and updated data in the energy, transport and forestry sectors will facilitate more effective and efficient policy making in all sectors described in this INDC.
- v. Expertise in climate mitigation and adaptation needs to be enhanced. This includes capacity to study and explore the potential adoption of international market mechanisms as a means of achieving its mitigation objectives.
- vi. Brunei Darussalam has limited experience with (e.g.) energy efficiency conservation and renewable energy technologies. It will continue to participate in regional networks for knowledge sharing and capacity building.
- vii. Social and behaviour changes in terms of vehicle use by the general public. The Land Transport White Paper highlighted, Brunei Darussalam features "extremely high levels of car ownership, use and dependency" and shares of public transport, walking and cycling are extremely low. Incentives to encourage the use of public transport is required.



Burkina Faso

**CONTRIBUTION PREVUE DETERMINEE
AU NIVEAU NATIONAL (CPDN)
AU BURKINA FASO**



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Liste des acronymes

COP	Conférence des Parties
CCNUCC	Convention-cadre des Nations Unies sur les changements Climatiques
CSLP	Cadre Stratégique de Lutte contre la Pauvreté
GES	Gaz à Effet de Serre
IDH	Indice de Développement Humain
INDC	Intended Nationally Determined Contributions
LAME	Laboratoire d'Analyse Mathématique des Equations
ONU	Organisation des Nations Unies
PANA	Programme d'Action National d'Adaptation
PIB	Produit intérieur brut
PNA	Plan National d'Adaptation
PNSR	Programme National du Secteur Rural
SCADD	Stratégie de Croissance Accélérée et de Développement Durable
SP/CONEDD	Secrétariat Permanent du Conseil National de l'Environnement et du Développement Durable
TDR	Termes de Reference

Section 1. Introduction

La France accueillera la vingt-et-unième Conférence des Parties de la Convention-cadre des Nations Unies sur les changements climatiques (COP21/CMP21), qui se tiendra à Paris en Décembre 2015 et qui devrait aboutir à un nouvel accord international sur le climat, applicable à tous les pays. L'ensemble de la communauté internationale attend de cet accord qu'il soit universel et durable. Il devra donner les signaux économiques et politiques, pour que le modèle de développement économique de notre planète s'engage sur une nouvelle trajectoire, menant à la neutralité carbone avant la fin du siècle, ainsi qu'au respect de l'objectif des 2°C, c'est-à-dire le maintien du réchauffement global des températures sous la barre des +2°C).

La COP21, du 30 novembre au 11 décembre 2015, vise principalement à conclure un accord engageant 195 États à réduire leurs émissions de gaz à effet de serre ou GES. L'objectif final est que les contributions de ces États (différentes d'un pays à un autre) permettent de stabiliser le réchauffement climatique dû aux activités humaines en deçà de 2°C d'ici à 2100 (par rapport à la température de l'ère préindustrielle). Chaque pays remettra ses engagements à la Convention Cadre Climat (UNFCCC) dans un document appelé **Intended Nationally Determined Contributions** ou **INDC** d'ici la fin octobre 2015.

Section 2. Contexte et cadre institutionnel

2.1. Contexte Institutionnel

Les contributions nationales regroupent 2 types d'objectifs :

- Les **objectifs d'atténuation**, qui visent à réduire les émissions de gaz à effet de serre, par exemple en modifiant les techniques de production employées. L'INDC Burkina Faso présente des éléments chiffrables et fait mention de l'année de référence, de la période d'engagement, du calendrier de mise en œuvre, ainsi que précise les méthodologies employées pour estimer les émissions de GES.
- Les **objectifs d'adaptation**, qui visent à réduire la vulnérabilité des systèmes naturels et humains aux effets des changements climatiques réels ou prévus.

La contribution aux objectifs de ce second volet est volontaire, cependant significative au Burkina Faso et donc nécessaire à présenter en scénario distinct: **Adaptation Intégrée**.

Encadré #1

Selon le Ministère en charge du développement durable, les principes sur lesquels reposent les contributions nationales sont :

Ambition: les contributions ont vocation à dépasser les engagements actuels des États. Les engagements actuels s'inscrivent dans le cadre de la deuxième période d'engagement du Protocole de Kyoto – c'est notamment le cas pour l'Union Européenne, ou bien correspondent aux actions nationales volontaires souscrites au titre de l'accord de Copenhague et des accords de Cancun.

Equité et Différenciation: Les contributions sont examinées en tenant compte des circonstances nationales propres à chaque pays. Les pays les moins avancés et les petits États insulaires bénéficient notamment d'une certaine flexibilité dans l'élaboration de leur INDC compte tenu de leur capacité limitée.

Transparence: Les contributions qui ont été communiquées par les États sont publiées au fur et à mesure sur le site de l'UNFCCC. Une synthèse agrégeant l'ensemble des contributions des parties sera présentée par le secrétariat de la CCNUCC le 1er novembre 2015 sur la base des INDC reçues au 1er octobre.

2.2. Stratégies Nationales et Politiques, Cadre de Développement Durable

Les « états généraux de l'environnement et du développement durable » au Burkina Faso, tenus en novembre 2011, ont fortement recommandé l'élaboration d'une Politique Nationale de Développement Durable (PNDD) assortie d'une loi. Elaborée en 2013, la PNDD encadre efficacement la Stratégie de Croissance Accélérée et de Développement Durable (SCADD). Avec ce document de cadrage économique qu'est la SCADD, qui, est également juxtaposée à la « Prospective Burkina 2025 », les instruments cadres de politique contribuent à mettre la notion de durabilité au cœur de l'action publique et des autres acteurs non étatiques (PTF, ONG, OSC, Secteur privé) dans un élan de développement socioéconomique générateur de croissance et de revenus équitablement distribués à moyen et long termes et dans des secteurs de haute vulnérabilité climatique tels qu'identifiés par la Communication nationale².

2.3. Cadres de concertation et programmes mis en place pour l'adaptation et l'atténuation

Le Burkina Faso a ratifié la CCNUCC et le protocole de Kyoto respectivement en septembre 1993 et mars 2005. A ce jour, il a élaboré et adopté plusieurs documents de politiques et de stratégies relatifs aux changements climatiques, en réponse à certaines dispositions de ces protocoles. On peut, entre autres, citer:

- La Stratégie Nationale de mise en œuvre de la Convention sur les Changements Climatiques adoptée en novembre 2001;
- le Programme d'Action National d'Adaptation aux changements climatiques (PANA) en 2007;
- l'Elaboration d'un cadre NAMA (2008);
- le Plan National d'Adaptation (PNA, 2014).

Pour la prise en charge et le suivi des questions des changements climatiques, on retient la création au sein du Ministère en charge de l'environnement du Secrétariat Permanent du Conseil National pour la Gestion de l'Environnement (SP/CONAGESE), qui sera transformé en SP/CONEDD (Conseil National pour l'Environnement et le Développement Durable) avec des missions élargies.

En 1995, le Burkina Faso a mis en place le Comité Interministériel pour la Mise en œuvre des Actions de la Convention-Cadre des Nations Unies sur les Changements Climatiques (CIMAC). Ce comité a été pleinement impliqué dans l'élaboration de la Communication Nationale Initiale sur les changements climatiques.

2.3.1 Du PANA au PNA

Face à la dégradation des écosystèmes, à la récurrence des crises alimentaires et aux effets néfastes des changements climatiques sur l'environnement, les populations et le cheptel, le Gouvernement du Burkina Faso, avec l'appui du PNUD en tant qu'agence d'exécution du Fonds pour l'Environnement Mondial (FEM), a initié en 2005 la formulation de son Programme d'Action National d'Adaptation (PANA) à la variabilité et aux Changements Climatiques. Le PANA a été adopté au niveau national en novembre 2007. Dans ce cadre, et sous le leadership du SP/CONEDD, trois projets d'adaptation ont été élaborés et exécutés entre 2008 et 2013, avec l'appui des Coopérations danoise et japonaise et celui du Fonds pour l'Environnement Mondial (FEM). Le PANA répondait ainsi à une situation urgente où l'adaptation visait principalement les plus vulnérables, notamment les populations rurales.

Afin de valoriser les acquis de la mise en œuvre des trois projets d'une part, de répondre aux préoccupations de la Convention et d'élargir le plan à toutes les parties prenantes du développement d'autre part, le Burkina a élaboré un Plan National d'Adaptation (PNA) qui est bâti autour des résultats de l'analyse de la vulnérabilité aux changements climatiques des secteurs prioritaires identifiés (agriculture, élevage, eau, forêts et écosystèmes naturels, énergie, infrastructures et habitat, santé...) et des scénarii des changements climatiques aux horizons 2025-2050.

2.3.2 La nécessité d'un cadre NAMA

Le besoin d'évaluation quantitative du potentiel d'atténuation a conduit le Burkina Faso à élaborer un cadre NAMA en 2008, en l'occurrence le Programme Nationale du Secteur Rural (PNSR). Le PNSR s'inscrit dans la dynamique de programmation du développement à court, moyen et long terme, traduite par la conduite de l'Etude prospective Burkina 2025, l'élaboration du Schéma National d'Aménagement du Territoire (SNAT) et plus récemment (2010), par l'adoption de la Stratégie de Croissance Accélérée et de Développement Durable (SCADD) en lieu et place du Cadre Stratégique de Lutte contre la Pauvreté (CSLP).

Le PNSR qui vise l'horizon 2015 est une fédération des programmes sectoriels des départements de l'agriculture, de l'élevage, de l'eau, de l'environnement et du cadre de vie. Dans ce cadre, le potentiel d'atténuation pour la période 2008-2015 a été estimé à 9 174 816 TéquCo2 de GES soit 1 200 000 TéquCo2/an.

Les mesures d'atténuation proposées participent à l'atteinte des objectifs du Gouvernement à savoir la restauration des terres dégradées à raison de 30 000 ha/an, l'accroissement des superficies des plantations de 68 000 à 100 000 ha/an, l'accroissement des forêts naturelles de 170 000 à 500 000 ha, la réduction des superficies des forêts brûlées par les feux sauvages de 30 % du territoire national à 20 %, l'aménagement des zones cynégétiques villageoises par la sensibilisation et la formation des populations, et la diffusion des connaissances concernant les techniques relatives à la gestion durable des ressources naturelles.

2.3.3 La Deuxième Communication Nationale

En application des articles 4 et 12 de la Convention-Cadre des Nations Unies sur les Changements Climatiques (CCNUCC), le Burkina Faso a procédé à l'élaboration d'une Communication Nationale contenant les mesures visant à atténuer ou à faciliter une adaptation appropriée aux changements climatiques. C'est dans ce cadre que fut élaboré en 2014 la Deuxième Communication nationale, conformément aux directives de la décision 17/CP.8 adoptée par la huitième session de la Conférence des Parties à la CCNUCC. Le processus de son élaboration ayant commencé depuis 2006, les données d'inventaires prennent appui sur des données de **2007 comme année de référence**. Faisant l'état des changements climatiques, la Deuxième Communication nationale complète et met à jour certaines données déjà portées à la connaissance de la communauté internationale dans la Communication initiale de 2001 que le site web de la CCNUCC réfère à Mai 2002.

2.5. Les particularités de l'INDC du Burkina Faso

L'INDC du Burkina, pays faible émetteur, est l'un des rares qui présente les deux caractéristiques des INDC, voire une approche résultats (outcomes) et une approche actions/projets/activités.

Cela se traduit par une composante **Atténuation** qui ne prend en considération que les activités qui amènent à des résultats d'émissions crédités dont les objectifs ont été dès le départ orientés sur la réduction des émissions de Gaz à Effet de Serre et en particulier de carbone équivalent. Un exemple de ces initiatives sont les REDD + / PIF, l'initiative NAMA et des projets potentiels MDP dans des secteurs porteurs comme pour le Minier. C'est à partir de ces initiatives consacrées principalement à la réduction des gaz à effet de serre que le scénario Conditionnel hybride Atténuation / (Adaptation) est constitué.

L'INDC du Burkina comporte par ailleurs toute une composante **Adaptation** qui rend cet INDC quelque peu unique et ambitieux ; car l'analyse des options d'adaptation avec ses investissements particuliers et ses secteurs "vulnérables" à la recherche de résilience a mené à un Scénario Adaptation Intégrée. C'est dans cette composante qu'une approche Projets / Activités / Actions se dégage. Elle se justifie hautement par le fait que le « secteur rural », constitué des sous-secteurs Eau-Agriculture-Forêts-Utilisation des Terres (A.FO.LU) est à la fois le principal moteur de l'économie burkinabè (il fait vivre plus de 80% de la population) mais aussi le secteur le plus vulnérable aux effets du changement climatique.

Cette composante est ainsi constituée de projets dont l'objectif n'est pas PRINCIPALEMENT la réduction des GES (par la séquestration du carbone notamment) mais surtout la valorisation de services environnementaux tels que la sécurité alimentaire, la conservation des eaux et des sols, l'agriculture durable, la valorisation des produits forestiers non ligneux y compris les plantes médicinales, la promotion d'une architecture sans bois ni tôle (voûtes nubiennes), etc. Comme un bonus à la composante atténuation, ces projets résultent sur le moyen et long terme à des réductions considérables en GES qui dépassent même les résultats des efforts d'atténuation.

Section 3. Projections et options en atténuation

3.1. Méthodologie

L'équipe « Atténuation » a réalisé ses travaux sur la base de la méthodologie suivante:

- Exploitation de l'inventaire des GES de 2007, par secteur (i.e. Agriculture; Énergie incluant le secteur Transport; Déchets; Procédés industriels; Affectation des terres, Changement d'affectation des Terres et Forêts (ATCATF));
- Détermination des indicateurs socio-économiques pour la projection des émissions de GES du scénario « Business as Usual (BaU) » sur l'horizon 2030;
- Construction des scénarios de projections d'émissions de GES par secteur;
- Identification des actions d'atténuation, qui sont en cours ou qui sont programmées, par secteur;
- Analyse des impacts des actions d'adaptation pour intégrer leurs réductions d'émission indirectes (le cas échéant) dans le bilan d'atténuation;
- Évaluation de la contribution du Burkina Faso en termes d'atténuation;
- Recommandations d'actions d'atténuation par secteur;
- Niveau de couverture de la contribution: Les scénarios sont basés sur des données couvrant l'ensemble du territoire national.

Cette méthodologie se traduit dans le rapport comme suit:

- Une approche *GES Résultats* offrant une plus grande flexibilité sur la façon de parvenir à des réductions de GES, sans nécessairement préciser toutes les actions qui entraîneront des réductions d'émissions. Cette approche permet la transparence des calculs et projections et assure un meilleur suivi des progrès accomplis par rapport aux actions, puisque les cibles GES prennent généralement en considération l'inventaire national des GES de base (2014), et plus spécifiquement les données de secteur les plus détaillées possible.
- En conséquence du point 1, le Gouvernement pourrait s'engager sur des résultats quantifiés pouvant fournir une meilleure compréhension des réductions futures d'émissions et des niveaux d'émissions associées aux contributions, qui, une fois regroupés, facilitent une évaluation des futures émissions (Scénario conditionnel Atténuation et Adaptation). Ces états globaux permettent également des progrès dans la réalisation du suivi de l'INDC et offrent plus de crédibilité pour recevoir un financement et l'accès aux marchés, et d'améliorer la comparaison entre les INDCs. Il est également plus simple pour estimer les effets et les co-bénéfices selon l'approche résultats et /ou actions des GES.
- Dans l'INDC du Burkina Faso, les deux approches ont été utilisées: outcomes en majorité en Atténuation et outcomes et projets (actions) en Adaptation.
- Il en ressort donc trois scénarios: 1 scénario BaU; 1 scénario Inconditionnel; et 1 scénario Conditionnel qui intègre les projets Adaptation dont l'objectif principal est la réduction des GES "crédités".
- La section Atténuation présente ces trois scénarios et leurs descriptions par secteurs clés en matière de contribution aux GES, tout en essayant de garder les mêmes secteurs clés pendant toute l'analyse des trois scénarios mais aussi dans la section Adaptation et dans la section Socioéconomique ; le reste des secteurs ne servant qu'à donner un coût d'investissement si des projets /actions secondaires sont amenés à contribuer à une réduction encore plus grande des GES aux différents horizons (aux coûts de 2015) jusqu'à 2030.
- Les secteurs clés identifiés sont : L'agriculture, les déchets et l'énergie qui inclut la production d'électricité, le transport, le résidentiel et le tertiaire ainsi que les industries manufacturières, l'habitat, etc. En termes de représentation dans le rapport, chacun de ces secteurs montrera:
 - Ses projections en quantités d'émissions dans le scénario BaU, Inconditionnel et Conditionnel;

- les graphiques des trois scenarios;
- un tableau synthèse /matrice regroupant toutes ces données + le coût d'investissement(Cout de réduction d'1 tonne de CO2).

Le tableau synthèse suivant met l'emphase résume les scenarii en Atténuation.

Tableau 1. Réduction des émissions et coûts d'investissements associés suivants les scenarii d'atténuation

Scenarii / secteurs	Réduction des émissions à l'horizon2030		Cout d'Investissement(en US\$)
	En chiffre (Gg)	en % de réduction	
BaU (sous total) :	118 323		
Inconditionnel			
Agriculture	7 236,3	6,1%	21 646 581
Déchets	-		
Énergie	572,0	0,5%	1 063 272 580
S/total Inconditionnel	7 808,3	6,6%	1 084 919 161
Conditionnel			
Agriculture	10 560	8,9%	64 939 743
Déchets	76,30	0,1%	81 228 000
Énergie	3 130,00	2,6%	609 866 667
S/Total ConditionnelHybride	13 766,30	11,6%	756 034 410
S/Total Atténuation	21 574,63	18,2%	1 840 953 571

Source, Compilation Auteurs, juillet 2015.

3.2. Objectif: niveau de contribution du Burkina Faso

Trois scenarios ont été donc considérés en Atténuation pour évaluer l'évolution des émissions et les réductions possibles à partir d'une situation de référence et du potentiel de financement:

- Un scénario «tendanciel» (Business as Usual - BAU) correspondant au prolongement du passé dans l'hypothèse que le développement économique continue sans rupture;
- Un scénario « inconditionnel » prenant en compte toutes les politiques publiques engagées après 2007, prenant en compte des évolutions technologiques et des études récentes et ayant un financement acquis ou en cours d'acquisition;
- Un scénario conditionnel qui prend en compte l'ensemble des projets d'atténuations élaborés et / ou en cours d'élaboration mais n'ayant pas de financement acquis.

3.3. Analyse de la situation de référence des émissions GES et Identification de l'année de référence

L'année de référence retenue est 2007, date de la finalisation du deuxième rapport des inventaires des gaz à effet de serre au Burkina Faso. Les projections vers le futur, selon différents scénarios, sont faites à partir de cette année de base et des paramètres appropriés résultants de l'évolution

antérieure du système socio-économique (tendancier) ou les hypothèses de la prévision (scénarios inconditionnel et conditionnel).

3.3.1 Détermination et justification de l'année cible

Le Burkina a choisi 2030 comme cible étant donné que cette date coïncide avec le deuxième rendez-vous des OMD. Par ailleurs, le Gouvernement du Burkina Faso a adhéré à l'Initiative "Energie Durable Pour Tous (SE4ALL)" du Secrétaire Général des Nations Unies qui vise à atteindre, d'ici 2030, trois objectifs majeurs:

- Assurer l'accès universel aux services énergétiques modernes;
- Doubler le taux d'amélioration de l'efficacité énergétique;
- Doubler la part des énergies renouvelables dans le bouquet énergétique mondial.

3.3.2 Choix des paramètres de projection

Les paramètres susceptibles d'influer sur la trajectoire des tendances ont été passés en revue. De concert avec les structures en charge des statistiques, en l'occurrence l'Institut National des statistiques et de la Démographie, les paramètres suivants ont été retenus pour leur pertinence.

Tableau 2. Types d'émissions de GES selon les tendances sectorielles

Secteurs	GES	Paramètres de projection utilisés
<i>Tendance sols agricoles</i>	NO ₂	Évolution des importations d'intrant
<i>Tendance résidus agricoles brûlés au champs + brûlage contrôlé de savane</i>	NO _x CO CO ₂	Tendance historique INSD
<i>Tendance fermentation entérique</i>	CH ₄	Taux de croissance du cheptel
<i>Tendance gestion du fumier</i>	CH ₄	Taux de croissance du cheptel
<i>Tendance changement d'affectation des terres et foresterie</i>	CO ₂ CH ₄ N ₂ O NO _x CO	Tendance historique INSD
<i>Tendance gestion déchets liquides</i>	CH ₄	Taux de croissance de la population
<i>Tendance gestion déchets solides</i>	CH ₄	Taux de croissance de la population
<i>Tendance transport</i>	CO ₂	Évolution importation carburant
<i>Tendance production électricité</i>	CO ₂	Tendance évolution
<i>Tendance industries manufacturières</i>	CO ₂	Taux de croissance PIB industrielle
<i>Tendance résidentielle</i>	CO ₂	Taux de croit du gaz butane et du pétrole lampant
<i>Tendance processus industriels</i>	CO ₂	Tendance historique INSD

Source: Auteurs, juillet 2015.

3.3.3 Situation de référence des émissions

La situation de référence est celle de la deuxième Communication Nationale du Burkina Faso, 2014 (dont les inventaires de GES prennent référence sur les données de l'année 2007) dans le cadre de la CCNUCC et dont le tableau 3 ci-contre constitue une récapitulation significative (émissions totales et relatives par source d'émission).

Tableau 3. Situation de référence des émissions des GES

Catégorie	Principaux gaz émis	Émissions GES (Gg) 2007	En pourcentage du total des émissions
Sols agricoles	N2O	8 239	37,6%
Fermentation entérique	CH4	9 517	43,4%
Résidu agricole brûlé aux champs + brûlage contrôlé de savane	CO2, NOX, CO	189	0,9%
Gestion du fumier	CH4	1 196	5,5%
Changement d'affectation des terres et foresterie	CO2, CH4, N2O, NOX, CO	250	1,1%
Gestion des déchets solides	CH4	667	3,0%
Gestion des eaux liquides	CH5	245	1,1%
Transport	CO2	782	3,6%
Production électricité	CO2	350	1,6%
Résidentiel	CO2	60	0,3%
Tendance industries manufacturières	CO2	118	0,5%
Processus industriels	CO2	303	1,4%
GES Total pays		21 916	100%

Source: Communication Nationale du Burkina Faso, 2014.

L'analyse du scénario tendanciel montre que les émissions de GES du Burkina vont continuer à croître de manière substantielle. A l'horizon 2030 le niveau des émissions sera multiplié par cinq comparativement à celle de l'année 2007 et quasiment par 1.6 comparativement à 2015 (tableau 4 ci-dessous).

Tableau 4. Evaluation globale tendancielle de l'état des GES de 2007 à 2030

Émissions GES par catégorie (Gg de CO2 par eq)	2007	2015	2020	2025	2030
Tendance secteur agriculture, foresterie et land use	19 391	71 436	85 545	95 561	103 424
Gestion des déchets solides	667	852	993	1 156	1 347
Gestion des eaux liquides	245	313	364	424	494
Tendance transport	782	1 447	2 439	4 110	6 925
Tendance production électricité	350	648	1 476	2 487	4 191
Tendance « Résidentiel »	60	96	128	172	230
Tendance industries manufacturières	118	175	223	285	363
Tendance processus industriels	303	667	894	1 121	1 348
Total	21 916	75 633	92 062	105 316	118 323

Source: Auteurs, juillet 2015.

3.3.4 Résultats des scénarios et analyses

Au regard des projets et programmes retenus dans le scénario inconditionnel et conditionnel, les résultats des projections donnent, ci-après, la part des réductions opérées par rapport au scénario tendanciel, aussi appelé « Business as Usual » (BAU). Il convient, en effet, de rappeler, qu'à l'instar de plusieurs pays en développement la faible appropriation et de maîtrise des technologies est concomitante du niveau très bas de développement du pays comme le Burkina Faso et de la faiblesse de ses émissions de GES. En dépit des efforts, l'urgence à faire face à des situations de crise récurrente dans plusieurs secteurs appelle l'utilisation de technologies disponibles sur le marché et à moindre coût, bien souvent moins appropriées à la protection de l'environnement local ou global (centrales thermiques d'urgence financées très souvent lors de grands délestages et de mouvements sociaux, dépendance vis-à-vis des moyens de transport obsolètes ailleurs, techniques agricoles à faibles intrants technologiques et consommatrices d'espace et de main d'œuvre, faible gestion des déchets, etc.). D'où la préférence à penser les réductions de GES par rapport à une tendance possible que par rapport à une année de référence qui nous paraît peu réaliste.

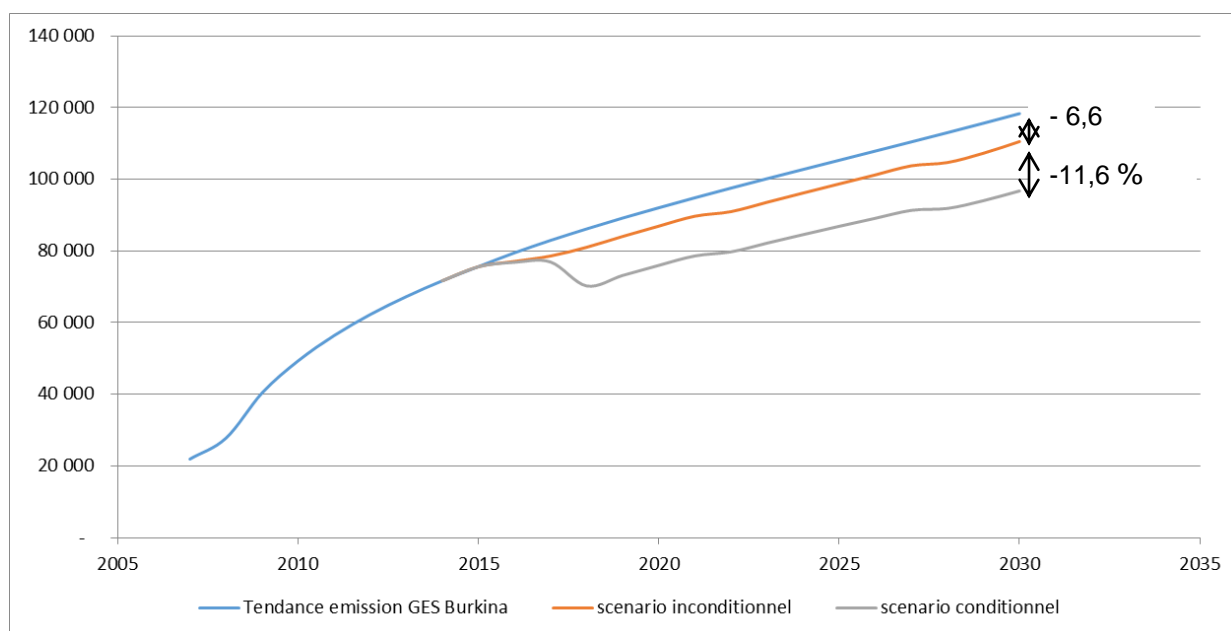
Le tableau 5 et la figure 1 ci-dessous illustrent l'évolution des émissions des GES selon les trois scénarii adoptés.

Tableau 5. Evolution des émissions (BaU) et part de réduction selon les scénarii

	2007	2015	2020	2025	2030
BaU (en Gg)	21 916	75 633	92 062	105 316	118 323
Scénario Inconditionnel (réduction en Gg)		-	5 133	6 608	7 808
Scénario Inconditionnel (réduction en %)		0%	5,58%	6,27%	6,60%
Scénario Conditionnel (réduction en Gg)			10 953	11 829	13 766
Scénario Conditionnel (réduction en %)		0%	11,9%	11,2%	11,6%

Source: Auteurs, juillet 2015.

Figure 1. Illustration des tendances d'émissions des GES en différents scénarii



Le tableau 6 ci-dessous donne une désagrégation des réductions du scénario inconditionnel. On note que l'atténuation sectorielle est principalement due aux projets et programmes dans l'Agriculture, la Foresterie et les changements d'affectation des sols (entre 6 et 7% de 2020 à 2030), les choix technologiques dans l'industrie électrique (entre 20 et 12% de 2020 à 2030) et à l'efficacité énergétique dans les industries manufacturières (3%.respectivement en 2020 et 2030). Les réductions mentionnées ici sont relatives à la tendance BAU du secteur.

Tableau 6. Désagrégation des réductions des GES (Gg et %) du scénario inconditionnel par rapport au tendanciel

Années	2015		2020		2025		2030	
	Gigagrammes	%	Gigagrammes	%	Gigagrammes	%	Gigagrammes	%
Secteur d'activité								
Agriculture, Foresterie et Utilisation des sols	-	0%	- 4 809	-6%	- 6 209	-6%	- 7 236	-7%
Déchets solides	-		-		-			
Transport	-5,86	-0,40%	29,3	-1,20%	29,3	-0,71%	29,3	-0,42%
Production d'électricité	22,18		284,30	-19,26%	344,40	-13,85%	493,04	-11,76%
Résidentiel	0,36	-0,37%	10,38	-8,10%	25,62	-14,93%	49,71	-21,65%
Energie dans les Industries manufacturières	5,24	-3,00%	6,69	-3,00%	8,54	-3,00%	10,90	-3,00%

Source: Auteurs, juillet 2015

De manière similaire, le tableau 7 ci-dessous donne une désagrégation des réductions du scénario conditionnel. On note qu'en 2030 et toujours par rapport au scénario tendanciel, l'atténuation sectorielle proviendrait principalement des projets et programmes dans l'Agriculture, la Foresterie et les changements d'affectation des sols (10% de réduction par rapport à la tendance sectorielle, d'une moindre consommation des hydrocarbures dans les transports (42%), les choix technologiques dans l'industrie électrique (4%) et de l'efficacité dans le résidentiel et le tertiaire (21%) due à un remplacement massif de l'éclairage traditionnel par l'introduction des lampes basse consommation. Les réductions mentionnées ici sont relatives à la tendance BAU du secteur.

Tableau 7. Désagrégation des réductions des GES (Gg et %) du scénario conditionnel par rapport au tendanciel

Années	2015		2020		2025		2030	
	Gigagrammes	%	Gigagrammes	%	Gigagrammes	%	Gigagrammes	%
Secteur d'activité								
Agriculture, Foresterie et Utilisation des sols	-	0%	- 10 560	12%	- 10 560	11%	- 10 560	10%
Déchets solides			- 60	-4%	- 75	-5%	- 76,3	-4%
Transport			244	-10%	1069	-26%	2911	-42%
Production d'électricité	22,18	-3%	73,87	-5%	94,10	-4%	162,80	-4%
Résidentiel			10,02	-8%	25,26	-15%	49,35	-21%
Energie dans les Industries manufacturières	3,53	-2%	4,49	-2%	5,72	-2%	7,30	-2%

Source: Auteurs, juillet 2015

Au cours des quinze dernières années, le Burkina est resté en tête des pays de l'Union économique et monétaire ouest-africaine (UEMOA) avec une croissance moyenne annuelle de 5,5 %, et ce en dépit de divers chocs exogènes. L'économie Burkinabé est fortement dominée par l'agriculture qui occupe près de 80 % de la population active. Le coton est la culture de rente la plus importante pour le pays. L'essentiel des émissions des gaz à effet de serre dans le secteur de l'agriculture provient des catégories de la fermentation entérique et des sols agricoles.

En 2007, le secteur de l'agriculture a contribué à 88 % des émissions de GES au niveau national. L'élevage, à travers l'activité de fermentation entérique, est la catégorie qui contribue le plus aux émissions de GES (près de la moitié annuellement). Les sols agricoles occupent le second rang en termes de contribution à ces émissions.

Section 4. Projections et options d'adaptation

4.1. Stratégie de long terme du Burkina Faso en matière d'adaptation

De façon globale, la planification du développement s'appuie sur la Stratégie de Croissance Accélérée et de Développement Durable (SCADD). L'économie du Burkina Faso a été depuis le départ basée sur le secteur primaire, secteur le plus exposé depuis plus de 40 ans maintenant aux effets de la variabilité du climat et considéré aujourd'hui comme le plus vulnérable aux changements du climat. C'est pourquoi le gouvernement du Burkina Faso a pris en charge de façon spécifique les questions de changement climatique depuis les grandes sécheresses des années '70 à travers une action soutenue de lutte contre la désertification qui frappe durement le monde rural.

En 2014, et dans le cadre du Programme National de Partenariat pour la Gestion Durable des Terres (CPP), le Burkina Faso a élaboré et validé un **Cadre Stratégique d'Investissement en Gestion Durable des Terres (CSI-GDT)**. La vision en matière de gestion durable des terres (GDT) au Burkina Faso qui prend pour horizon de projection l'année 2025 est la suivante: «*des systèmes de production rurale durables qui, en prenant en compte les connaissances et les savoir-faire locaux, (i) préservent la fertilité des sols, (ii) augmentent la productivité végétale et animale par unité de surface exploitée et/ou par unité de volume d'eau consommée, (iii) améliorent le bien-être des populations vivant de la terre, (iv) restaurent et préservent l'intégrité et les fonctions des écosystèmes* ».

Considéré comme un Plan d'Actions du PNSR dans le domaine de la Gestion Durable des Ressources Naturelles (GDRN), le CSI-GDT prend appui sur l'ensemble des programmes et actions prévus dans le cadre du PNSR, financés ou à la recherche de financement.

Les objectifs, les résultats et les produits attendus du CSI-GDT coïncident largement avec les thématiques classées prioritaires du Plan National d'Adaptation (PNA). Parce qu'il a défini des ambitions quantitatives pour le pays à l'horizon 2025 dans les secteurs de la GDRN ainsi que leurs coûts, le CSI-GDT peut être considéré comme un plan d'action opérationnel en matière d'adaptation dans les secteurs de l'agriculture, de l'élevage, des forêts et de l'utilisation des terres, de la gestion de l'eau et de la biomasse-énergie.

4.2. Les objectifs stratégiques en matière d'adaptation

Le plus grand souci pour le Burkina Faso, comme pour tout autre pays, est que les changements climatiques prévus pour les prochaines cinquante années sont déjà inévitables. Donc le premier intérêt de Burkina Faso, qui n'est pas un Etat grand émetteur de GES, est inévitablement d'améliorer la capacité des populations à s'adapter aux conditions qui existeront d'ici à 2025, 2030 ou 2050: une hausse significative de la température moyenne, des saisons sèches plus sévères, des saisons de pluie plus fortes et moins prévisibles, un problème croissant de sécheresse, la baisse de la nappe phréatique et une augmentation de la fréquence de certaines maladies. Le seul scénario auquel on devrait se préparer est la situation tendancielle, "*business as usual*" («*les affaires comme d'habitude* »); parce que les effets climatiques auxquels le Burkina doit se confronter sont déjà entamés, et les impacts positifs des possibles actions d'atténuation à envisager dès maintenant, soit au niveau local soit au niveau global, ne se ressentiront qu'après le terme d'applicabilité de l'INDC (2030).

Les mesures d'adaptation prévus dans le PNA (Plan National d'Adaptation) du pays a pour objectifs de (i) réduire la vulnérabilité aux impacts des changements climatiques en développant des capacités d'adaptation et de résilience, (ii) faciliter l'intégration de l'adaptation aux changements climatiques, d'une manière cohérente, dans des politiques, des programmes ou des activités, nouveaux ou déjà existants, dans des processus particuliers de planification du développement et des stratégies au sein de secteurs pertinents et à différents niveaux.

4.3. Secteurs concernés par les projets d'adaptation

À partir des actions d'adaptation identifiées dans le Plan National d'Adaptation pour les principaux secteurs vulnérables aux changements climatiques, il a été demandé aux experts nationaux (issus du secteur public, de la société civile et du secteur privé) participant à l'atelier de lancement et de consultation de la présente étude, de classer celles qu'ils jugent prioritaires au regard de leur connaissance du contexte environnemental et socio-économique du pays. L'exercice de classement étant à la fois individuel et collectif, il est supposé qu'une action recevant l'appui de plus de 50% des participants pourrait être considérée comme d'importance significative. Le résultat d'un tel exercice est présenté au tableau ci-après.

Tableau 8. Actions prioritaires dans le cadre des projets d'adaptation

Secteur	Mesures d'adaptation préconisées	Applicabilité sur le court, moyen ou long terme		% des Participants donnant Priorité A Chaque Action
1. GDT – Gestion durable des terres				
A3	Promotion de la gestion durable des terres (GDT)– Amélioration de l'accès à l'information climatique	M		88%
	Inclue:			
A1	Mise en culture de variétés précoces ou résistantes à la sécheresse	C		50%
A2	Mise en œuvre de techniques de conservation des eaux et des sols (cordons pierreux, diguettes, diguettes filtrantes, terrasses, demi-lunes, agroforesterie, fixation des dunes, etc.)	C		50%
A4	Pratique de la gestion intégrée de la fertilité des sols	M		50%
	Tout par moyen de:			
EA7	Élaboration de schémas directeurs d'aménagement et de gestion des eaux	C		50%
EA2	Réalisation de retenues d'eau : construction de puits modernes, de forages à grand débit, de barrages; aménagements de mares ; dérivation de cours d'eau		L	75%
E3	Aménagement des planset points d'eau pastoraux		L	69%
E2	Délimitation et aménagement des zones à vocation pastorales	M		50%
EA3	Lutte contre l'ensablement des plans d'eau		L	63%
A6	Mise en œuvre de techniques d'irrigation économes en eau	C		56%
ECO8	Développer des programmes de recherche sur la résilience des espèces forestières, fauniques et halieutiques		L	56%
ECO7	Réhabilitation et préservation des zones humides		L	44%

Secteur	Mesures d'adaptation préconisées	Applicabilité sur le court, moyen ou long terme		% des Participants donnant Priorité A Chaque Action
2. Foresterie				
F1	Mise en œuvre des bonnes pratiques forestières et agroforestières (coupe sélective du bois de feu, régénération naturelle assistée, défrichage contrôlé, etc.)	C		88%
F6	La protection des berges des cours et plans d'eau		M	69%
F4	Pratique de l'agroforesterie pour une gestion durable des ressources naturelles		M	56%
	Par moyen de:			
F2	Gestion Communautaire et Participative des ressources forestières, fauniques et halieutiques			L 56%
3.Énergie				
N3	Diversification des sources d'énergie (solaire, éolien, biogaz)		M	88%
N6	Promotion des technologies d'économie d'énergie dans l'industrie et le bâtiment			L 63%
4. Éducation environnementale				
Eco1	Développement de l'éducation environnementale aussi bien dans les systèmes d'enseignement formel que les systèmes d'enseignement non formel		M	63%
5. Aliments				
SA10	Amélioration des méthodes de transformation et de conservation des aliments		M	56%

Source: Auteurs, juillet 2015.

4.4. Actions d'adaptation retenues par secteur concerné

On remarquera, fort utilement, que les thématiques classées comme prioritaires par les experts participants à l'atelier de consultation, coïncident presque en totalité avec les objectifs et actions développées et proposées dans le Cadre Stratégique d'Investissement pour la Gestion Durable des Terres (CSI-GDT) (cf1.1).

Le tableau 8 suivant, inspiré du modèle de mise à l'échelle des technologies de Gestion Durable des Terres (CILSS, 2015) résume les actions d'adaptation proposées dans le cadre de l'INDC pour les secteurs de l'agriculture et de la gestion de l'eau, de l'élevage, de la biomasse énergie, des forêts et des changements dans l'utilisation des terres en général (AFOLU).

Elles intègrent des actions transversales liées notamment à la recherche adaptative dans ces secteurs.

Le tableau 9 quant à lui présente les actions d'adaptation dans les secteurs ou domaines de:

- L'habitat et l'urbanisme;

- La santé;
- La gestion des évènements climatiques extrêmes.

Les données de base servant à l'alimentation du modèle sont issues de la revue de la documentation pertinente disponible ou ont été fournies par les experts nationaux des départements ministériels compétents.

L'annexe 2 présente le détail des projets d'adaptation proposés pour l'INDC.

Tableau 9. Actions d'adaptation dans les secteurs AFOLU

Les actions / projets d'adaptation	Technologies correspondantes	Cibles INDC				Régions cibles potentielles	Total Population concernée (2015)	Tonnes de CO2 séquestrés/ Economisés par an horizon 2030	Coût de l'investissement en US\$: considérer 40% supplémentaire pour les coûts de mise en œuvre (IEC, administration, renforcement capacités, suivi-évaluation.) (coût constant 2015)			Retour sur investissement pour l'économie nationale: (%)
		Unité	2020	2025	2030				2020	2025	2030	
Secteur Agriculture et gestion de l'eau									385 350 000	770 700 000	1 156 050 000	
<i>105.000 ha d'aménagement de CES chaque année pour la restauration ou le maintien de la fertilité des terres de culture</i>	Zaï seul	Ha cumul	75 000	150 000	225 000	Nord; Centre-Nord; Sahel; nord de la Boucle du Mouhoun; nord de l'Est	2 250 000	666 000	31 500 000	63 000 000	94 500 000	67
	Zaï + cordons pierreux	Ha cumul	175 000	350 000	525 000	Nord; Centre-Nord; Sahel; nord de la Boucle du Mouhoun; nord de l'Est	5 250 000	1 554 000	122 500 000	245 000 000	367 500 000	45
	Cordons pierreux végétalisés	Ha cumul	225 000	450 000	675 000	Toutes Régions sauf Cascades	6 750 000	1 998 000	81 900 000	163 800 000	245 700 000	31
	Cordons pierreux + Zaï + RNA	Ha cumul	50 000	100 000	150 000	Nord; Centre-Nord; Sahel; nord de la Boucle du Mouhoun; nord de l'Est	1 500 000	444 000	40 250 000	80 500 000	120 750 000	39

<i>10.000 ha de micro-bassins (demi-lunes) chaque année pour la restauration de la fertilité des terres de culture</i>	Demi-lunes agricoles (avec apport de fumier)	Ha cumul	50 000	100 000	150 000	Toutes régions avec Pluviométrie inférieure ou égale à 600 mm/an	1 500 000	444 000	21 000 000	42 000 000	63 000 000	100
<i>1.000 ha par an de bas-fonds sont aménagés et mis en valeur, associés au système de riziculture intensive (SRI)</i>	SRI	Ha cumul	5 000	10 000	15 000	Grand-Ouest + toutes autres régions où riziculture irriguée	500 000	44 400	2 800 000	5 600 000	8 400 000	188
<i>1.000 kits d'irrigation «goutte à goutte» sont vulgarisés chaque année pour l'irrigation de 250 ha en production de haut rapport (cas oignon)</i>	Irrigation goutte à goutte	Ha cumul	1 250	2 500	3 750	Toutes Régions	20 000	0	35 000 000	70 000 000	105 000 000	25
<i>10 Unités d'Intensification des Productions Agricole à partir de forages à gros débit et utilisant des techniques innovantes d'irrigation sont créées chaque</i>	Irrigation goutte à goutte	Ha cumul	1 000	2 000	3 000	Régions grands aquifères souterrains	12 000	0	50 400 000	100 800 000	151 200 000	42

<i>année au profit de Groupes de jeunes entrepreneurs agricoles(base pomme de terre ou melon)</i>												
Secteur Elevage									171 493 396	342 986 792	490 680 189	
<i>75.000 ha de terres dégradées sont réhabilités chaque année à des fins sylvo-pastorales</i>	Microbassins (demi-lunes) à la charrue Delfino + semis d'herbacées et de ligneux	Ha cumul	375 000	750 000	1 125 000	Nord; Centre-Nord; Sahel; nord de la Boucle du Mouhoun; nord de l'Est	5 922 637	3 330 000	78 750 000	157 500 000	236 250 000	147
<i>10.000 tonnes de fourrage grossier (foins et résidus de cultures) sont récoltés et stockés chaque année</i>	Fauche et conservation de foin	Cumul tonnes de MS	50 000	100 000	150 000	Nord; Centre-Nord; Sahel; nord de la Boucle du Mouhoun; nord de l'Est	1 500 000	NA	5 943 396	11 886 792	17 830 189	45
<i>5 zones d'intensification des productions animales sont mises en place sur le territoire national</i>	Aménagement et équipement de zones stratégiques répondant aux besoins des périodes critiques	Unité	1	2	2	Est, Sud-Ouest; Hauts-Bassins, Cascades; Centre-Ouest, Boucle du Mouhoun	3 586 000	300 000	23 800 000	47 600 000	47 600 000	67
<i>25 milliers de ménages en 2020 sont équipés de</i>	Bio digesteurs	Unité	25 000	50 000	75 000	Toutes régions	1 500 000	300 000	45 500 000	91 000 000	136 500 000	104

<i>biodigesteurs fonctionnels dans au moins 10 régions du Burkina Faso</i>												
<i>Le compost issu des bio digesteurs servent à fertiliser 750 000 ha de terres cultivables (un biodigester permet de fertiliser 10 à 12 ha)</i>	Fertilisation organique des terres de culture	Ha	250 000	500 000	750 000	Toutes régions	3 750 000	1 500 000	17 500 000	35 000 000	52 500 000	450
Secteur Biomasse Energie									29 232 000	41 440 000	87 696 000	
<i>540 milliers de foyers améliorés sont produits et diffusés dont au moins 50% en milieu urbain et semi-urbain.</i>	Foyers améliorés ménages	Unité	180 000	350 000	540 000	Toutes régions	2 700 000	610 200	4 032 000	7 840 000	12 096 000	166
<i>80% des dolotières utilisent un foyer amélioré dont 95% en milieu rural et 100% en milieu urbain et semi-urbain ; Ceci contribue à une réduction de YY % de la demande en bois de feu</i>	Foyers améliorés dolo	Unité	60 000	80 000	180 000	Toutes régions sauf Sahel	1 000 000	610 200	25 200 000	33 600 000	75 600 000	92

Secteur Forêts/ Changement dans l'Utilisation Terres									345 800 000	588 000 000	903 000 000	
<i>2000 ha (soit 200 km) de berges des cours d'eau sont réhabilités et mis en défens chaque année</i>	Haies-vives; Mise en défens; RNA; tranchées delfino	Ha	10 000	20 000	30 000	Toutes régions	1 200 000	60 000	4 200 000	8 400 000	12 600 000	
<i>12 Régions (CT) ou 180 Communes, en rapport avec les communautés de base, créent et classent chacune 1 aire de conservation de la diversité biologique à vocation communale ou régionale d'une superficie minimale de 5.000 ha</i>	Reforestation / Conservation	ha	150 000	450 000	900 000	Est; Boucle du Mouhoun, Sud-Ouest, Cascades, Centre-Ouest; Hauts-Bassins	8 441 000	9 360 000	84 000 000	252 000 000	504 000 000	
<i>Les plans d'aménagement de X forêts classées sont audités et actualisés dans le but de diversifier les objectifs d'aménagement et de responsabiliser davantage les communautés riveraines (Ecobasedapproach)</i>	Aménagement /Gestion forêts naturelles	Ha	400 000	450 000	450 000	Est; Boucle du Mouhoun, Sud-Ouest, Cascades, Centre-Ouest; Hauts-Bassins; Centre-Nord	1 200 000	4 680 000	224 000 000	252 000 000	252 000 000	109

<i>200 Communes Rurales développent et mettent en œuvre, avec l'appui de l'Etat ou des ONG, des projets de RNA avec la participation d'au moins 5 communautés villageoises chacun</i>	Régénération Naturelle Assistée	Ha	200 000	450 000	800 000	Toutes Régions	2 000 000	1 600 000	33 600 000	75 600 000	134 400 000	83
Recherche adaptative dans les secteurs Eau, Agriculture, Elevage, Forêts									22 680 000	45 500 000	63 840 000	
<i>Recherche-Développement dans le domaine de l'eau, de ses usages et des impacts du changement climatique</i>		Mi F. CFA	1 000	2 000	3 100	Toutes les régions		NA	2 800 000	5 600 000	8 680 000	
<i>Amélioration de la protection des ressources en eau contre le comblement et les végétaux aquatiques envahissants</i>		Mi F. CFA	3 850	7 750	9 950			NA	10 780 000	21 700 000	27 860 000	
<i>Développement Participatif de Technologies de GDT / Recherche-Développement</i>		Mi F. CFA	3 250	6 500	9 750	Toutes les régions		NA	9 100 000	18 200 000	27 300 000	

<i>adaptative aux CC</i>												
SOUS-TOTAL SECTEURS A.FO.LU								27 500 800	954 555 396	1 788 626 792	2 701 266 189	

Source: Estimations des 'auteurs, d'après un modèle du CILSS, juillet 2015.

Tableau 10. Actions d'adaptation dans les autres secteurs vulnérables

Action / Projet d'adaptation	Cibles INDC			Coût Unitaire (en US\$)	Régions /Provinces/villes cibles potentielles	Population totale concernée par le projet ou l'action (2015)	Tonnes de CO2 séquestrés/ Economisés par an à l'horizon 2030	Coût de l'investissement en US\$: considérer 40% supplémentaire pour les coûts de mise en œuvre (IEC, administration, renforcement capacités, suivi-évaluation.) (coût constant 2015)			Retour sur investissement pour l'économie nationale (en %)	
	Unité	2020	2025					2030	2020	2025		2030
Habitat et Urbanisme								757 709 778	1 019 351 592	1 178 447 326		
<i>Cartographie et marquage des zones à risques d'inondation dans les agglomérations de plus de 5000 habitants en adaptation aux changements climatiques</i>	Agglomération	149	250		300 000	Toutes les agglomérations des communes urbaines et rurales du BF	14 016 646	0	62 580 000	105 000 000		
<i>Valorisation des matériaux locaux et Promotion d'un habitat sans bois ni tôle en adaptation aux changements climatiques dans les zones rurales et semi-urbaines du Burkina Faso</i>	Logements cumulés (90%) Moyenne : 27m ² / logement	1 432	5 806	19 152	100 us\$ /m ²	05 Com rurales/ province (225 sites) de vulgarisation. 1 VN dans 30 % des villages; 80 % des communes ;	16 676	906 178	7 393 778	29 960 392	98 828 926	233
	Bâtiments communautaires cumulés (10%) : 64 m ² / bâtiment	172	697	2 298	130 us\$ /m ²							

<i>Gestion des eaux pluviales et prévention des inondations dans les 13 capitales de région du Burkina Faso</i>	Km de canaux & caniveaux	700	900	1100	700 000	13 capitales de région	2 466 608	0	686 000 000	882 000 000	1 078 000 000	
<i>Efficacité énergétique dans l'habitat urbain et rural</i>	KWh/m²	200	180	160	1 600	Bâtiments administratifs des 13 capitales régions	2 466 608	0	448 000	403 200	358 400	
<i>Recherche et Développement de Technologies dans l'architecture et la construction en adaptation aux CC</i>	Unité de recherche	2	3	3	300 000	49 communes urbaines	3 181 351		840 000	1 260 000	1 260 000	
<i>Restauration et aménagement de la ceinture verte d'Ouagadougou</i>	ha	800	1300		400	Ville d'Ouagadougou	2 000 000	6 500	448 000	728 000	0	
Secteur de la Santé									1 327 200	18 536 000	18 466 000	
<i>Renforcement des capacités de prévision et de réponses aux phénomènes liés aux changements climatiques: ensemble de 9 activités</i>	Mi F. CFA	360	540	810	2000	Ensemble du pays			1 008 000	1 512 000	2 268 000	248

<i>Développement de la recherche sur la santé et les changements climatiques: ensemble de 3 activités</i>	Mi F. CFA	114	180	260	2000	Ensemble du pays			319 200	504 000	728 000	
<i>Renforcement des compétences du personnel sur les maladies sensibles aux changements climatiques: formation de 100 spécialistes</i>	Mi F. CFA		3400	5100	2000	Ensemble du pays			0	9 520 000	14 280 000	
<i>Renforcement des capacités de prévision et de réponses aux phénomènes liés aux changements climatiques: création d'un centre de Veille sanitaire MT</i>	Mi F. CFA		2500	5000	2000	Ensemble du pays			0	7 000 000	1 190 000	75 703
Renforcement du Système d'alerte précoce pour la gestion des évènements climatiques extrêmes									2 286 000	2 667 000	2 667 000	
<i>Transfert de technologies pour le suivi climatique, météorologique et environnemental</i>	Projet (Equipements, réhabilitation radar, Formation...)	1	1	1		Ensemble territoire national	18 450 494	NA	1 568 820	1 830 290	1 830 290	
<i>Informations hydrométéorologique</i>	Projet (Renforcement de capacités,	1	1	1		Ensemble territoire national			717 180	836 710	836 710	

Section 5. Analyse socioéconomique des projets INDC

5.1. Options économiques et financières des projets d'atténuation et d'adaptation

Les options d'adaptation et d'atténuation dans le contexte des pays en développement, à l'instar du Burkina Faso, sont une fonction multiple de facteurs dont les plus en vue sont (i)- le coût de la technologie, (ii)- la facilité d'application/ adoption de la technologie, (iii) le gain social, et (iv) l'abondance du facteur - consommable (ou matière primaire utilisable par la technologie).

Le facteur financier étant le déterminant de contrainte, en particulier pour des projets d'investissement à caractère plus social qu'économique, l'analyse de la mise en œuvre des projets d'atténuation et d'adaptation insiste plus sur les facteurs coûts (de mise en œuvre de la technologie) que sur les autres facteurs.

Il s'agit alors pour un pays comme le Burkina Faso, dès lors que les contraintes d'atténuation ne sont pas très élevées (comme c'est le cas pour les pays développés à haute intensité d'émissions) de jauger ses investissements par ordre croissant de coûts de mise en œuvre des projets.

Trois options sont alors possibles:

- Option 1: Projets d'atténuation et d'adaptation faisables à coût négatif;
- Option 2: Politiques/mesures/projets à coût net négatif ou nul si l'on tient compte des bénéfices connexes sociaux, économiques et environnementaux;
- Option 3: Projets à coûts d'atténuation positifs et faisables à condition de bénéficier d'une assistance internationale.

5.1.1 Options d'atténuation et d'adaptation faisables à coût négatif(ScénarioBaU)

Les projets à coût négatif sont définis comme des investissements produisant des économies d'échelle suffisantes de sorte à pouvoir couvrir les capitaux investis, l'entretien, les frais de fonctionnement et les charges d'intérêts pendant la durée du cycle de vie du projet. **Cette option est souhaitable dans tous les scénarii d'atténuation et d'adaptation, mais davantage dans les scénarios BaU (Business as Usual) ou Inconditionnel, à cause de la certitude que tout projet investi rapportera à ses investisseur surtout dans un contexte d'absence d'appui extérieur et où l'investissement est fait par emprunt obligataire au niveau intérieur.**

Dans le domaine de l'atténuation, les projets de reboisement et de foyers améliorés peuvent générer des coûts négatifs. L'affiliation aux fonds Carbone peut donner des bénéfices financiers capables de compenser ou contrebalancer les montants investis pour la mise en œuvre des projets, de sorte à rendre les coûts du projet négatifs.

5.1.2 Politiques/mesures/projets à coût net négatif ou nul si l'on tient compte des bénéfices connexes sociaux, économiques et environnementaux (équivalents au Scénario Inconditionnel)

Il est parfois difficile de déterminer les bénéfices quantitatifs et pécuniaires d'une politique sociale. La difficulté d'extrapolation des gains sociaux ou environnementaux en gains financiers explique la difficulté d'appréhension du coût net négatif ou coût nul. **Les projets dans le cadre de cette option ont une valeur absolue financière négative, mais une valeur absolue globale nulle ou positive quand on tient compte des effets economico-productifs, socio-sanitaires et environnementaux qu'ils génèrent. Leur mise en œuvre est optionnelle dans un contexte de scénarios inconditionnel ou tendanciel (BaU).**

Les exemples apparemment intéressants concernent les projets de « foyers améliorés-improvedcookstoves » et « foyers modernes et avancés-advancedcookstoves ».

5.1.3 Options à coût d'atténuation positif et faisables à condition de bénéficiaire d'une assistance internationale (équivalentes au Scénario Conditionnel Hybride)

Ce type de projets qui a généralement un objectif principal d'atténuation et de réduction des GES (projets MDP, REDD+ NAMA), est de deux types et correspond à des investissements faisables dans un contexte de scénario conditionnel (d'un financement extérieur):

- Le projet est très coûteux et rentable à une certaine échelle à cause des économies d'échelle qu'il va générer mais il faudrait un appui extérieur à cause de son coût élevé d'investissement;
- Le projet n'est pas financièrement rentable mais ses co-bénéfices économiques, socio-sanitaires et environnementaux sont importants ; et il faudrait presque impérativement le mettre en œuvre et nécessairement une assistance financière extérieure à cause de son coût élevé.

5.1.4 Relations entre options économiques et options d'atténuation et d'adaptation

Lorsque les investissements en projets d'atténuation ou d'adaptation sont financièrement rentables, le pays n'a pas besoin de contribution extérieure car le capital investi est à même d'être récupéré et les investisseurs recouvrent leurs capitaux investis. Ce type de projet doit être financé et réalisé dans un scénario d'atténuation BaU ou inconditionnel par des financements de l'Etat Central accompagné de ses partenaires locaux (y compris du privé dans le cadre d'un emprunt intérieur).

Cependant dans l'hypothèse d'un projet non financièrement rentable (mais cependant avec des impacts socioéconomiques et des co-bénéfices énormes) ou même rentable de surcroît avec des impacts socioéconomiques et des co-bénéfices énormes, les investissements se feront dans le cadre d'un scénario conditionnel hybride, c'est-à-dire l'exigence d'un appui financier extérieur/international au financement du projet.

Un exemple type de projets dans le cadre d'un scénario conditionnel dont le financement nécessite un accompagnement financier extérieur est le projet de « foyers améliorés ».

Les foyers améliorés dont la performance varie selon l'innovation technologique (improvedcookstove ou advancedcookstove) donnent selon l'emploi (ménages ou producteurs) une rentabilité financière plus ou moins positive. Dans le cas d'une utilisation du ménage, pour les besoins domestiques, la rentabilité est moindre mais dans le cas d'une utilisation à des fins de productions de *dolo* (bière de sorgho), la rentabilité est beaucoup plus élevée.

Cependant, dans l'un ou l'autre mode d'utilisation du foyer amélioré, les impacts et co-bénéfices de l'utilisation du foyer amélioré sont énormes:

- L'utilisation du foyer amélioré permet d'économiser l'énergie de cuisson de 15% à 45% selon l'évolution technologique. Cela veut dire que selon les cas précités, la destruction de la biomasse est préservée de 15% à 45%et cela est largement significatif à grande échelle;
- La rapidité de la cuisson consécutive à l'utilisation d'un foyer amélioré permet à l'utilisateur du foyer amélioré d'économiser 50% à 75% de son temps initial consacré à la cuisson ou à la production du dolo (selon l'usage du foyer amélioré). Cela veut dire que l'utilisateur du foyer peut consacrer plus de la moitié de son temps initial à d'autres activités génératrices de revenus et multiplier ainsi ses avoirs;
- L'utilisation des foyers améliorés permet aux ménages et aux autres usagers de réduire leur exposition aux maladies respiratoires du fait de la fumée et de la respiration du gaz carbonique ou, suivant les cas, du monoxyde de carbone. Les personnes préalablement exposées accroissent leur capital « santé » du fait de l'utilisation du foyer amélioré et les revenus préalablement affectés aux soins de santé sont épargnés.

Du fait donc des énormes bénéfices associés ci-dessus cités, de tels projets sont financés dans le cadre d'un scénario conditionnel avec besoin d'un accompagnement financier extérieur.

5.2. Méthodologie opérationnelle d'analyse

5.2.1 Objectifs

L'analyse socioéconomique des options et projets dans le cadre de l'INDC vise à:

- Déterminer la faisabilité des projets;
- Faire une analyse d'ensemble de l'impact des options « de développement vert » sur la croissance économique globale du pays;
- Permettre de prioriser les projets déjà identifiés et à mettre à œuvre;
- Définir les indicateurs de pertinence des projets;
- Déterminer les bénéfices et coûts socioéconomiques inhérents à la mise en œuvre;
- Faire une évaluation des effets et impacts des projets potentiels identifiés;
- Valider la pertinence des projets identifiés pour la planification, le financement et l'exécution;
- Faire une analyse relative des rapports « coûts-bénéfices » nets associés aux technologies optionnelles des projets;

La démarche d'analyse est bi-phasique et se base sur l'ensemble des projets identifiés dans les composantes « atténuation » et « adaptation »:

- Définition d'un cadre général d'appréciation des projets en se basant sur des critères et des indicateurs préalablement définis;
- Analyse des rapports « coûts-bénéfices » financiers et/ou et les co-bénéfices socioéconomiques et environnementaux des projets.

En l'occurrence, l'analyse des projets se basera sur les principes du CAD-OCDE : pertinence, efficacité, efficience, durabilité et impacts. Une analyse croisée « secteurs de projets INDC/ critères CAD-OECD » permettra de baliser un certain nombre d'indicateurs attendus pour lesquels, les différents projets viables et rentables devront être significatifs.

5.2.2 Cadre général d'analyse socioéconomique des projets

Le cadre général d'analyse des projets insiste sur leur contribution au développement global du pays:

- En termes de contribution du projet à la croissance verte et au maintien/redynamisation du stock du capital « ressources naturelles » en facilitant les processus d'atténuation des émissions de GES et d'adaptation des populations aux changements climatiques;
- En termes de contribution des projets à la création des richesses (croissance), à la multiplication des revenus nationaux et à la réduction de la pauvreté;
- Et en termes de facilité d'acquisition et de facilité d'appropriation de la technologie et autres inputs des projets;

A cet effet les critères identifiés dans le tableau 11 ci-dessous servent de signaux d'analyse de la contribution globale au développement, évaluée sur la base d'un score pondéré sur 100.

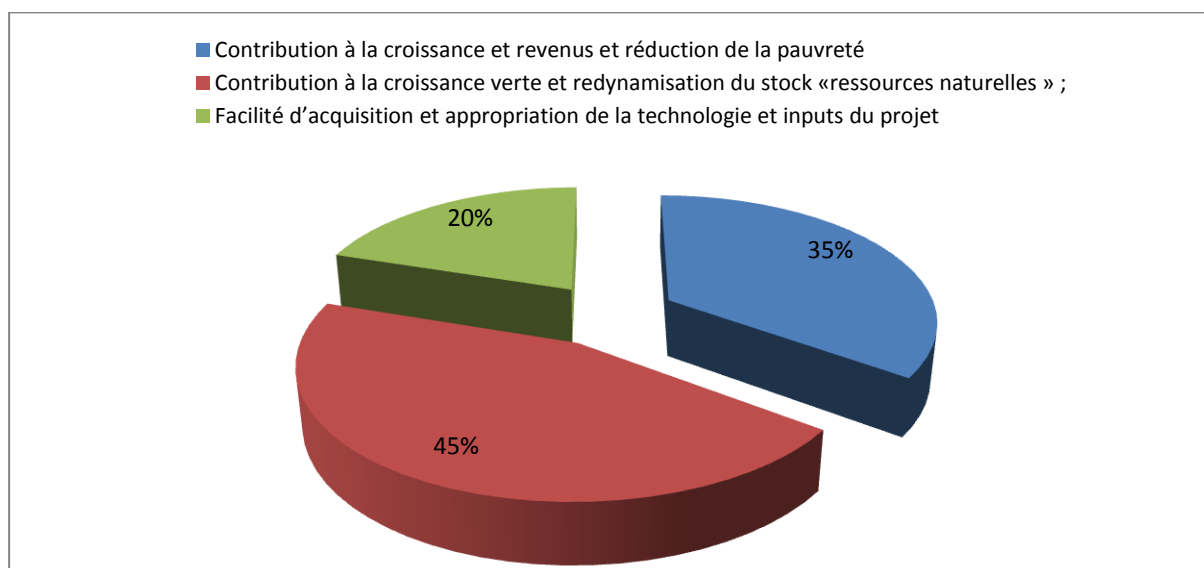
Pour chacune des 3 contributions ci-dessus citées, un projet sera noté de 1 à 10 selon sa force relativement à cette contribution et aura une note pondérée comprise entre 100 à 1 000 selon sa pertinence et son efficacité en termes de contribution globale au développement.

Tableau 11. Critères d'analyse et de priorisation des projets INDC

Critères d'analyse	Indicateurs pertinents associés	Score/ 100 = contribution globale au développement
<i>Contribution du projet à la création des richesses (croissance) et à la multiplication des revenus nationaux et à la réduction de la pauvreté</i>	<ul style="list-style-type: none"> > Quantité de production supplémentaire; > Rendement agricole; > Taux de rentabilité interne; > Nombre personnes supplémentaires bénéficiaires. 	35
<i>Contribution du projet à la croissance verte et au maintien/redynamisation du stock de capital «ressources naturelles »</i>	<ul style="list-style-type: none"> > Nombre de tonnes de CO2 séquestrés/ économisés par an; > Degré de conservation du capital naturel. 	45
<i>Facilité d'acquisition et la facilité d'appropriation de la technologie et d'inputs des projets</i>	<ul style="list-style-type: none"> > Coût financier de la technologie; > Disponibilité de la matière première (input de la technologie). 	20

Source: Auteur, août 2015

Figure 2. Critères d'analyse des projets INDC



De manière opérationnelle, l'analyse socioéconomique des projets s'attachera à faire des évaluations couplées:

- Du taux de retour sur investissement financier des projets;
- Des bénéfices prévus sociaux et économiques des projets;
- Des externalités environnementales positives ou négatives associées à la mise en œuvre des projets.

5.3. Résultats des analyses socioéconomiques et de mise en œuvre des projets conditionnels INDC

5.3.1 Coûts de mise en œuvre et co- bénéfices nets engendrés

À la différence des coûts d'investissements qui représentent les coûts d'acquisition de l'ensemble du capital productif (facteurs de production y compris les matières premières) des unités de productions, les coûts de mise en œuvre des projets représentent les frais de gestion et de suivi des unités de productions.

Les coûts de mise en œuvre des projets comprennent:

- Les coûts de formulation des projets (études de faisabilité, de formulation);
- Les coûts de gestion de projets (couts administratifs de fonctionnement de l'Unité de Gestion des différents projets) comprenant les coûts de renforcement de capacités;
- Les coûts de soutien à la mise en œuvre comprenant les coûts éventuels pour l'Information, l'Éducation et la Communication –IEC;
- Les coûts de suivi et d'évaluation des projets.

Il est considéré ici que les coûts de mise en œuvre représentent environ 40% des coûts d'un projet. Le tableau 12ci-dessous donne une estimation des coûts de mise en œuvre des différents projets par secteurs INDC.

Tableau 12. Coûts d'investissements et de mise en œuvre des projets conditionnels INDC (en US\$)

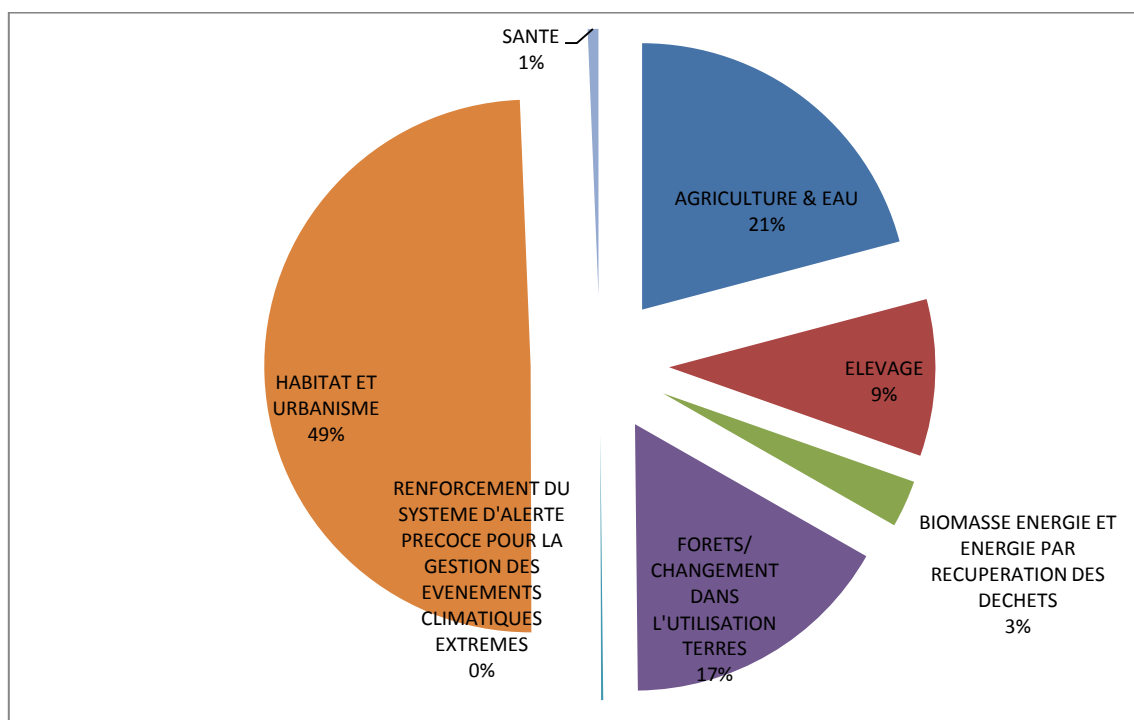
Secteurs d'intervention des projets de l'INDC	Coûts d'investissements des projets sectoriels	Coûts de mise en œuvre	Co-bénéfices associés à la mise en œuvre des projets sectoriels
<i>Agriculture & eau</i>	1 233 470 000	493 388 000	<ul style="list-style-type: none"> > Accroissement annuel de la production agricole et plus spécifiquement les quantités de produits céréaliers, améliorant conséquemment les niveaux de sécurité alimentaire de même que les niveaux de revenus des paysans ; ce qui amoindrit l'incidence de la pauvreté. > Les actions proposées permettent une séquestration du carbone dans le sol (plus de 5 150 GgeqCO2 séquestrés à l'horizon 2030), contribuent à la restauration des terres dégradées et à l'atténuation des effets sur le réchauffement climatique dans le but final de préserver les écosystèmes et les ressources en eau.
<i>Élevage</i>	562 080 189	224 832 076	<ul style="list-style-type: none"> > L'utilisation des biodigesteurs permet de produire du compost pour la fertilisation des terres agricoles (toutes choses qui accroissent la production agropastorale et les revenus des producteurs) ; elle fournit l'énergie aux ménages ruraux, contribuant à élever leur standard de vie ; > L'utilisation des biodigesteurs contribue à la sauvegarde de la biomasse-énergie parce que les stocks de bois à des fins d'énergie de cuisson ou de chauffage/éclairage sont ; > L'aménagement des espaces pastoraux sauvegardera la biodiversité de même que la mobilisation des eaux de surface qui seront désormais mieux valorisées dans les zones d'intensification des productions animales (ZIPA)
<i>Biomasse énergie et énergie par récupération des déchets</i>	168 924 000	67 569 600	<ul style="list-style-type: none"> > L'utilisation des foyers améliorés permet d'économiser le bois-énergie consommé (par rapport aux foyers traditionnels); et la rapidité de cuisson associée permet au ménage ou préparateur des repas d'économiser son temps et de l'affecter à d'autres travaux générateurs de revenus. Ce qui peut être doublement comptabilisé comme bénéfices financiers. > L'utilisation des foyers améliorés permet aux populations locales/rurales un gain de capital santé (du fait des maladies respiratoires qu'elles évitent de la respiration du monoxyde de carbone) ; les ménages et principalement les femmes peuvent alors économiser les dépenses supportées pour les soins de santé. > La transformation des déchets en méthane est une source supplémentaire d'énergie propre (de même que les nouveaux débouchés d'emplois consécutifs) et les villes pourront être débarrassées de leurs déchets au bonheur des populations

Secteurs d'intervention des projets de l'INDC	Coûts d'investissements des projets sectoriels	Coûts de mise en œuvre	Co-bénéfices associés à la mise en œuvre des projets sectoriels
<i>Forêts/ changement dans l'utilisation terres</i>	979 246 000	391 698 400	<ul style="list-style-type: none"> > Les investissements forestiers sont une contribution inestimable à l'agroforesterie, à la préservation de la biodiversité et une réponse adéquate à la dégradation de l'environnement et au réchauffement climatique; > Les projets forestiers, menés par des communautés défavorisées, permettent de combiner harmonieusement la préservation des forêts et le développement agricole en valorisant les cultures agricoles dans une dynamique d'accroissements des revenus locaux; > Les projets de création de massifs forestiers et d'aménagement des forêts naturelles permettent la conservation des sols et de l'eau, la réduction des facteurs d'érosion, la dépollution de l'air et la conservation de la diversité biologique, sans compter avec la fourniture de produits forestiers ligneux et non ligneux, y compris pour l'alimentation et la pharmacopée.
<i>Renforcement du système d'alerte précoce pour la gestion des événements climatiques extrêmes</i>	7 620 000	3 048 000	<ul style="list-style-type: none"> > Les informations météorologiques permettent aux producteurs d'accroître leurs opportunités d'investissements en leur fournissant des informations d'importance sociale et économique qui permettent d'adapter leurs systèmes de production, de sauvegarder leurs personnes, leurs moyens de subsistance et leurs productions; > Les actions de transfert de technologies pour le suivi climatique, météorologique et environnemental permettent une réadaptation des facteurs de production et de consommation en fonction de l'évolution du climat et des changements climatiques et permettent d'accroître le ratio « coûts-bénéfices » du producteur en préservant les acquis environnementaux (économie de la ressource en eau).
<i>Habitat et urbanisme</i>	2 918 154 526	1 167 261 810	<ul style="list-style-type: none"> > Les investissements dans une meilleure connaissance et délimitation des zones à risques d'inondation permettent un meilleur aménagement de l'espace habité et une prévention efficace des effets des inondations ; contribuant ainsi à la sécurisation et à l'amélioration des conditions de vie. > Ils permettent aussi la promotion d'une architecture adaptée aux conditions de changements climatiques, la valorisation des matériaux locaux et l'économie des ressources en bois; ce qui par ricochet, renforce la conservation des forêts et de la biodiversité. > Les investissements dans l'efficacité énergétique dans l'habitat permettent enfin des économies significatives dans les budgets d'énergie des entités publiques et des ménages, tout en améliorant le confort global.

Secteurs d'intervention des projets de l'INDC	Coûts d'investissements des projets sectoriels	Coûts de mise en œuvre	Co-bénéfices associés à la mise en œuvre des projets sectoriels
<i>Santé</i>	38 329 200	15 331 680	<ul style="list-style-type: none"> > Les investissements dans les capacités nationales de prévision, de suivi et de gestion des maladies climato-dépendantes permettent sans conteste d'accroître la productivité globale de l'économie et à l'accroissement des productions nationales; > les travailleurs en bonne santé dépensent moins de ressources pour se soigner et produisent davantage; > l'Etat du Burkina Faso maîtrise davantage les coûts sociaux des changements climatiques.
<i>Énergie renouvelable</i>	PM scenario inconditionnel	PM	<ul style="list-style-type: none"> > L'utilisation des sources alternatives d'énergie (solaires, biocarburants, etc.) permet de réduire les coûts de l'énergie pour les ménages et les entreprises qui accroissent leur productivité; > Elle permet d'atténuer la pollution générée par l'utilisation des énergies fossiles dans les transports et la production d'électricité.
<i>Transport</i>	PM scenario inconditionnel	PM	<ul style="list-style-type: none"> > Les investissements dans les biocarburants permettent d'avoir une disponibilité des sources d'énergies alternatives et de diversifier les sources énergies renouvelables; > Le projet de transport modal permet de diversifier les moyens et infrastructures de transport.
Coût total	5 907 823 915	2 363 129 566	

Source: Auteur, Août 2015, Estimations à partir du tableau des actions d'adaptation et d'atténuation.

Figure 3. Représentation graphique des proportions des projets du Scénario Adaptation INDC par secteurs en coûts d'investissements et de mise en œuvre



5.3.2 Classement des projets INDC par ordre de priorité de mise en œuvre

Sur la base des pondérations (weightingbasedapproach) préalablement réalisées pour les différents projets conditionnels (elle a consisté à leur attribuer des notes allant de 1 à 10 selon leurs contributions respectives à la création des richesses (35%), à la croissance verte/maintien des ressources naturelles (45%) et à la facilité d'accès/adoption de la technologie (20%), on peut classer les différents projets conditionnels par ordre de priorité suivant la taille de leur note pondérée.

Le tableau 13 ci-dessous donne un classement de l'ensemble des projets conditionnels par ordre de priorité de financement et /ou de mise en œuvre

Tableau 13. Classement de l'ensemble des projets du Scénario Adaptation INDC par ordre de priorité de mise en œuvre

N° de priorité	Les actions d'adaptation prévues à l'INDC	Secteurs INDC	Score pondéré-priorisation
1.	Promotion des foyers dolo dans le but de toucher 97% des dolotières à l'horizon 2030	Énergie biomasse/ énergie par récupération des déchets	935
2.	vulgarisation de 15.000 kits d'irrigation «goutte à goutte» en vue de l'irrigation de 3 750 ha à partir d'eau de surface pour la production de culture de haut rapport (exemple tomate ou pomme de terre).	Agriculture Eau	915
3.	Restauration et maintien de la fertilité de 1,575 millions d'ha de terres de culture, par diverses techniques de conservation de l'eau et des sols (CES).	Agriculture Eau	890

N° de priorité	Les actions d'adaptation prévues à l'INDC	Secteurs INDC	Score pondéré-priorisation
4.	L'équipement de 75 000 ménages en 2030 avec des biodigesteurs fonctionnels dans au moins 10 régions du Burkina Faso	Élevage	875
5.	Restauration et aménagement de la ceinture verte d'Ouagadougou	Habitat & urbanisme	875
6.	Projet Boisement reboisement équivalent à 1 Programme d'Investissement Forestier (PIF)	Forêts-land use	870
7.	Production et diffusion de foyers améliorés en milieu urbain et semi-urbain	Énergie biomasse/ énergie par récupération des déchets	865
8.	Gestion des eaux pluviales et prévention des inondations dans les 13 capitales de région du Burkina Faso	Habitat & urbanisme	865
9.	Valorisation des matériaux locaux et Promotion d'un habitat sans bois ni tôle en adaptation aux changements climatiques dans les zones rurales et semi-urbaines du Burkina Faso	Habitat & urbanisme	860
10.	Création de 150 Unités d'Intensification des Productions Agricoles (UIPA) à partir de forages à gros débit et utilisant des techniques innovantes d'irrigation (goutte à goutte sous pression)	Agriculture Eau	825
11.	Intégration de l'utilisation efficace et effective des informations hydrométéorologiques et environnementales dans les plans de développement à long terme pour produire des alertes précoces et saisonnières	Système d'alerte Précoce	825
12.	Réhabilitation de 1 125 000 ha de terres dégradées à des fins sylvo-pastorales, soit un investissement de 75 000 ha chaque année	Élevage	805
13.	Renforcement des capacités de prévision et de réponses aux phénomènes liés aux changements climatiques: ensemble 9 activités	Santé	800
14.	Efficacité énergétique dans l'habitat urbain et rural	Habitat & urbanisme	795
15.	fauche et la conservation de 10 000 tonnes de fourrage grossier chaque année (foins et résidus de cultures)	Élevage	790
16.	Création et classement de 900 000 ha d'espaces de conservation de la diversité biologique à vocation régionale dans 12 Régions (CT) ou 180 Communes	Forêts-land use	785
17.	Réalisation de 800 000 ha de Régénération Naturelle Assistée (RNA) dans 200 communes rurales	Forêts-land use	785
18.	Restauration de 150 000 ha de terres dégradées à des fins de production agricole, par la réalisation de 10 000 ha de micro bassins (ou demi-lunes) chaque année	Agriculture Eau	770
19.	Récupération de méthane à partir des eaux usées de la station d'Épuration de la ville d'Ouagadougou	Énergie biomasse/ énergie par récupération des déchets	770
20.	Transfert de technologies pour le suivi climatique, météorologique et environnemental	Système d'alerte Précoce	770

N° de priorité	Les actions d'adaptation prévues à l'INDC	Secteurs INDC	Score pondéré-priorisation
21.	Amélioration de la protection des ressources en eau contre le comblement et les végétaux aquatiques envahissants	Agriculture Eau	765
22.	Création et la gestion durable de 5 Zones d'Intensification des Productions Animales (ZIPA) dans 5 régions du pays	Elevage	760
23.	Recherche et Développement de Technologies dans l'architecture et la construction en adaptation aux changements climatiques	Habitat & urbanisme	745
24.	Récupération de méthane à partir des déchets solides du Centre d'enfouissement Technique de la ville d'Ouagadougou	Energie biomasse/ énergie par récupération des déchets	725
25.	Poursuite des actions de recherche développement dans le domaine de l'eau, de ses usages et des impacts du changement climatique	Agriculture Eau	720
26.	Cartographie et marquage des zones à risques d'inondation dans les agglomérations de plus de 5000 habitants en adaptation aux changements climatiques	Habitat & urbanisme	720
27.	L'aménagement de 15 000 ha de bas-fonds et périmètres irrigués et leur mise en valeur par lesystème de riziculture intensive (SRI)	Agriculture Eau	705
28.	Développement de la recherche sur la santé et les changements climatiques: ensemble de 3 activités	Santé	690
29.	Audit des plans d'aménagement de toutes les forêts classées ou protégées en vue de leur actualisation	Forêts-land use	685
30.	Renforcement des capacités de prévision et de réponses aux phénomènes liés aux changements climatiques: création d'un centre de Veille sanitaire MT	Santé	680
31.	Développement Participatif de Technologies de Gestion Durable des Terres / Recherche-Développement adaptative aux CC	Forêts-land use	675
32.	Renforcement des compétences du personnel sur les maladies sensibles aux changements climatiques: formation de 100 spécialistes	Santé	670
33.	Réhabilitation et la mise en défens de 30 000 ha de berges des cours d'eau	Forêts-land use	640

Source: Auteur, Août 2015, Estimations à partir du tableau des actions d'adaptation et d'atténuation

5.4. Sources et conditions de financement

Les sources de financements des projets INDC sont multiples.

La disponibilité des sources de financement dépendra de la capacité du Burkina Faso à développer une coopération active vis-à-vis des partenaires et institutions de financement. Pour financer les projets INDC, le Burkina Faso pourrait compter sur l'accès au « **Fonds Vert Climat - FVC** » et sur la disponibilité du Fonds d'Intervention pour l'Environnement (FIE) créée par le Gouvernement, pourvu que ce fonds se dotedes règles de transparence, de neutralité et de bonne gouvernance, permettant la création en son sein d'un guichet FVC.

Le renforcement des relations bilatérales avec les pays amis et multilatérales avec les institutions comme la Banque Mondiale, l'Union Européenne, le FEM, le PNUD, le PNUE, la BAD, la BID, la BOAD, la CEDEAO ou encore l'UEMOA, tous, des partenaires financiers potentiels pour les différents projets, à travers des fonds mis déjà sur place, pourra permettre au Burkina Faso de financer ces projets dans le cadre des changements climatiques et des accords et conventions internationales.

Le secteur privé burkinabè se verra attribuer une grande partie (presque 50%) du financement), à condition que les banques commerciales soient sensibilisées par rapport à ces types de financement.

Le Burkina Faso soutient l'utilisation des mécanismes de marché tels que le Mécanisme de Développement Propre (MDP) comme un outil performant de Monitoring, Reporting et de Vérification pour les activités d'atténuation et un outil pour les financements axés sur les résultats. Le Burkina appuie donc l'utilisation des Unités de Réduction Certifiée d'Émissions (URCE) délivrées par les projets et programmes d'activités du Mécanisme de Développement Propre pour atteindre les objectifs d'atténuation pré-2020. La rémunération du carbone de sorte à le rendre économiquement viable dans les contextes spécifiques des Pays les Moins Avancés, les Pays en Développement et les Petits États Insulaires en Développement est donc une priorité. Pour se faire la mise en place de nouvelles règles de comptabilisation dans le cadre de la CCNUCC pour garantir l'intégrité environnementale des mécanismes de marché et éviter la double comptabilisation est nécessaire. Ces règles de comptabilisation seront aussi introduites pour le FIE pour une transparence financière exigée.

Section 6. Mise en œuvre et suivi et évaluation de l'INDC

6.1. Schéma et acteurs de mise en œuvre

La mise œuvre des projets INDC nécessitera la mise en place d'une Unité de Coordination des Projets INDC qui pourrait être placée sous la tutelle du SP-CONEDD¹. L'Unité de Coordination sera chargée de coordonner et superviser (suivre) la mise en œuvre des différents projets INDC et comprendra trois entités techniques:

- Une entité de coordination chargée de la programmation des activités de mise en œuvre des différents projets;
- Une Cellule Technique **Adaptation** qui s'occupera de la coordination de la mise en œuvre et du suivi des projets d'Adaptation et qui pourrait devenir une Autorité Nationale Désignée – Adaptation (AND-AD);
- Une Cellule Technique **Atténuation** qui s'occupera de coordonner la mise en œuvre et assurera le suivi des projets d'Atténuation en collaboration ou pour le compte de l'AND Burkina Faso (Autorité Nationale Désignée).

Les cadres et experts au sein de ces unités coopéreront étroitement avec les cadres des différents ministères en charge des projets que sont:

- Le Ministère en charge de l'Agriculture;
- Le Ministère en charge des Ressources en eau;
- Le Ministère en charge des Ressources animales;
- Le Ministère en charge de l'Environnement et des forêts;
- Les Ministère et les Institutions publiques en charge de la Recherche Scientifique, et de L'innovation Technologique;
- Le ministère en charge de l'Habitat et de l'Urbanisme;
- Le Ministère en charge de la Santé;
- Le Ministère en charge de l'Énergie;
- Le Ministère en charge des Transports.

L'Unité de Coordination travaillera avec les Départements ci-dessus et d'autres ministères à vocation transversale comme le Ministère de l'Economie et des Finances, celui en charge de la Promotion des femmes et du Genre et celui de la Coopération internationale, dans le cadre des accords de financements. Elle assurera enfin la coordination avec les structures de la Société Civile et les Institutions représentatives du Secteur Privé.

6.2. Schéma et acteurs du suivi et d'évaluation

L'Unité de Coordination sera chargée du suivi global des activités de mise en œuvre des projets INDC². Pour cela, elle devra disposer d'un manuel de procédures administratives et d'un système harmonisé de suivi-évaluation des projets détaillant les principales responsabilités et les objectifs assignés.

Les acteurs d'évaluation des projets sont externes et viendront des partenaires techniques et financiers des projets à mettre en œuvre. Ces évaluations seront annuelles ou ponctuelles et prendront en compte, à certaines étapes de mise en œuvre des projets, les travaux d'évaluateurs indépendants.

¹ Le CONEDD est, selon les options de la politique nationale de développement durable, appelée à évoluer en Conseil National pour le Développement Durable (CNDD).

² Chaque projet disposant en lui-même d'un dispositif de suivi-évaluation utilisant des outils harmonisés (et au besoin standardisés) avec les autres projets de l'INDC.

Section 7. Conclusion

Dans l'INDC du Burkina Faso les thèmes Atténuation et Adaptation ont été intégrés, les deux étant étroitement liés : pour "atténuer" il faut "adapter" principalement, puisque le secteur agriculture-foresterie-utilisation des terres (AFOLU) est un secteur d'émissions mais aussi un secteur de séquestration majeur. Et en conséquence l'adaptation contribue grandement aux revenus de l'atténuation (séquestration de CO₂ et émissions évitées x prix de la tonne de carbone sur les marchés boursiers).

Pourtant l'adaptation nécessite des fonds substantiels. Bien que le prix de la tonne de CO₂ se soit effondré sur les marchés globaux, la réduction des émissions de CO₂ reste un excellent indicateur de performance et d'impact des programmes et projets d'atténuation au Burkina Faso. Le CO₂ n'est cependant pas le seul pourvoyeur de vie au Burkina Faso (sécurité alimentaire, pollution atmosphérique, qualité de l'air et de l'eau). Une molécule d'eau (H₂O) est aussi vitale pour les sols que le CO₂ pour la sécurité alimentaire et pour la chaîne du cycle de vie. En adaptation, la conservation de l'eau (H₂O) (eau de ruissellement, nappes phréatiques, etc.) est un indicateur d'adaptation au même titre que le CO₂ en atténuation. Le CO₂ et l'H₂O peuvent donc être comptabilisés: le CO₂ à sa valeur boursière et l'H₂O à sa valeur économique.

En **Atténuation** (Approche Résultats), et avec un objectif de réduire les émissions de carbone et d'augmenter la séquestration, les 3 scénarios sont clairs et évidents. Il s'agit de prioriser ces scénarios en les reliant à des investissements en adaptation, en technologie propre et en projets dont l'objectif final serait une société à faible émission de carbone et un monde rural plus vert.

En **Adaptation**, les options sont surtout variées et il s'agit aussi de les prioriser dans un tableau de synthèse basé sur les projections en atténuation, les options d'adaptation et les investissements requis. Par exemple, l'adaptation en matière de gestion des ressources en Eau est multisectorielle, avec des initiatives pour la sauvegarde (conservation) de cette ressource, en qualité et quantité. En plus la collecte, le recyclage, la réutilisation, les technologies de traitement de l'eau et les schémas innovateurs de valorisation et de bonne gouvernance de l'eau ajouteraient de la « limpidité » à cette eau. D'autres idées d'adaptation s'insèreraient dans le Cadre Stratégique d'Investissement en Gestion Durable des Terres (CSI-GDT), avec un budget en même temps ambitieux et conservateur de 869 milliards de FCFA pour 5 ans. Avec 1/3 des terres dégradées et donc 9 316 000 ha en détresse, l'application de bonnes pratiques d'utilisation des sols et la gestion durable des terroirs ne manquent pas de demande, pourvu que les fonds touchent directement les plus vulnérables (les exploitants de ces Terres) et que l'action s'attaque directement au problème de la gouvernance des ressources naturelles à tous les niveaux. Il est donc ambitieux d'élaborer pour cet INDC un Scénario Adaptation Intégrée.

En termes de Co-bénéfices, et afin de les maximiser, les régions du Nord et le secteur Elevage auront besoin de plus d'attention et d'investissements majeurs. Là aussi les actions d'atténuation et d'adaptation (comme dans le secteur Forêts) s'installent en symbiose et aussi en parallèle.

Les changements climatiques amplifieront leurs impacts là où il y a déjà la pression démographique, c'est-à-dire dans les zones peuplées urbaines.

Les pays du G7 se sont engagés à apporter 100 milliards de dollars par an d'ici à 2020 à la lutte contre le changement climatique, dont une partie doit transiter par le Fonds Vert pour le Climat (FVC).

Cette somme promise par la communauté internationale doit soutenir les pays en développement dans la limitation de leurs émissions de gaz à effet de serre et leur adaptation aux effets du changement climatique. Cet engagement ne couvre cependant pas l'intégralité des besoins pour financer la réduction des GES au niveau mondial, qui sont estimés entre 650 milliards et 1950 milliards de dollars US par an. Le Burkina Faso avec son INDC devra se positionner parmi la Société des Nations pour avoir accès à ces fonds.

En termes de financement, le véhicule Fonds d'Intervention pour l'Environnement(FIE) mis en place par le Burkina Faso apparaît comme un excellent outil, à condition que les règles d'opérationnalisation de ce Fonds soient flexibles, transparentes de façon à en faire un outil de bonne gouvernance. Dans ce Fonds, pourraient être payés les revenus des réductions d'émissions. Et puisque l'adaptation est au cœur de l'atténuation et la provoque, on pourrait logiquement imaginer qu'un pourcentage des revenus en atténuation soit mobilisé pour financer des options d'adaptation (par exemple jusqu'à 75%) selon des mécanismes innovateurs. On pourrait aussi imaginer plus globalement qu'un pourcentage du FIE(40%) aille vers la mise en œuvre de mesures d'adaptation et de mitigation (15%), les technologies de pointe de suivi et évaluation / certification (15%) ainsi que vers la recherche appliquée (10% par exemple).

L'INDC du Burkina Faso s'est voulu **participatif** dès la première reactivité, notamment les ateliers 1 à 3 et le groupe ad hoc de travail, **robuste, équitable, ambitieux et transparent**, pour ne citer que quelques qualificatifs.

Robuste, l'INDC l'est par ses éventails de données, d'analyses multiples, de tableaux de synthèse et de réflexion poussés dans les domaines de l'environnement, du changement climatique, de l'atténuation et de l'adaptation, du social, du socioéconomique et dans les scénarios qui valorisent les réflexions.

Pour être **équitable** ou se doter d'équité, l'INDC a voulu démontrer à la Société des Nations, que malgré les faibles émissions de carbone et de GES de ce pays par rapport aux émissions globales, le Burkina Faso assume sa responsabilité par rapport aux émissions qu'elle émet, surtout dans le secteur AFOLU. Pour se faire et malgré le fait que le coût de la réduction d'émissions et le rapport coût d'investissement/bénéfice (santé, bénéfices sociaux, sécurité alimentaire) soient élevés au Burkina, le Gouvernement entend bien engager des actions majeures d'atténuation dans le secteur de l'énergie, et d'adaptation dans les secteurs rural, de la santé et de l'habitat pour aider à réduire ses émissions tout en réduisant considérablement la vulnérabilité des secteurs stratégiques de son économie.

L'INDC est **ambitieux** car il transgresse le « scénario BaU » pour aller vers deux autres scénarios, Inconditionnel et Conditionnel hybride intégrant l'atténuation avec l'adaptation. Dans le scénario Inconditionnel, le Burkina explore de nouvelles cibles et pousse à fond des opportunités d'atténuation que le pays devrait atteindre si ce pays prenait les mesures techniques et économiques nécessaires pour arriver à une croissance économique ambitieuse, et pour suivre une courbe ascendante, encore non réalisée dans tous les secteurs de développement. Dans celui Conditionnel Hybride, le Burkina Faso tend vers un développement durable. Et pour transformer l'économie de "consommation de ressources" du Burkina en économie graduellement verte (ou presque) et en société à faible émission de carbone, le scénario Adaptation Intégrée se prête bien. Dans ce scénario il est estimé que la valeur totale des services environnementaux fournis par les actions proposées dans les secteurs AFOLU sur les 15 années jusqu'en 2030, serait au moins de US\$ 11.500.000.000 (11,5 milliards de dollars) ; ce qui donnerait un retour sur investissement de plus de 400% (ceci à comparer avec le retour seulement financier de la production primaire de 64% (soixant-six fois plus grand). Ces services environnementaux, bien qu'invisibles dans une économie de consommation mesurée en PIB, sont réels dans une économie circulaire ou à capital Nature et apportent beaucoup à l'économie nationale.

Tout en étant équitable et ambitieux, l'INDC se veut **transparent** et aspire à atteindre les objectifs de la Convention Climat en s'alignant sur l'objectif des 2°C et en considérant le besoin de limiter les émissions cumulatives sur cette période de temps à presque zéro. Encore une fois, cet objectif est ambitieux et requiert une transparence totale. Techniquement et économiquement, cela veut dire pour le Burkina une économie à faible rendement en carbone (société à faible émission de carbone) et un pays à couverture et économie verte. Avec sa nature semi-aride et les conditions climatiques encore plus incertaines pour les années à venir, cette transformation va demander des efforts considérables et des investissements colossaux en adaptation, surtout dans les secteurs Agriculture-Forêts-Utilisation des Terres(AFOLU). Les solutions d'adaptation existent pour aider la population à prévoir et se

préparerà faire face aux effets du changement climatique qui arriveront inévitablement à cause des émissions de GES déjà faits depuis 1900 jusqu'à aujourd'hui.

Il s'avère que beaucoup d'actions d'adaptation dépendent des technologies propres qui elles-mêmes contribuent à la baisse des émissions de GES. Les plus importantes sont en lien avec la gestion des terres et la conservation des eaux, des sols et des forêts, afin d'augmenter la résilience des populations. Il est donc important que le gouvernement, avec ses partenaires, les donateurs internationaux, appuie ces initiatives et permette, par des investissements justifiés et propres, leur plus grande expansion possible à travers tout le pays.

Section 8. Engagements/ recommandations

L'engagement du Burkina Faso se conjugue à travers trois scénarii.

Un premier scénario **Inconditionnel(annexe 1)** qui vise à réduire les émissions de GES de 7 808 Gg par an en 2030, **soit 6,6%** par rapport au BaU, pour des investissements en cours d'US\$ 1.125 milliards;

Un scénario **Conditionnel Hybride(annexe 1)** visant à réduire les émissions de GES de **11,6%** correspondant à 13 766 Gg par an en 2030 pour des investissements d'US\$**756 032 667**;

Un troisième scénario **Adaptation(annexe 2)** qui vise entre autres à restaurer et aménager 5,055 millions d'ha de terres dégradées à l'horizon 2030, correspondant à 55% de la superficie totale actuelle des terres dégradées au pays permettant de nourrir près de 6 millions de personnes supplémentaires à l'horizon 2030. Ces projets d'adaptation contribueront par ailleurs à réduire les émissions de GES de 43 707Gg de CO₂, **soit 36.95 % par rapport au BaU**, pour un investissement total d'US\$ 5 804 949 915.

En guise de recommandations, elles se résument à:

- Garantir l'utilisation du Fonds d'Intervention pour l'Environnement et dont la transparence financière ne fera aucun doute, pour recevoir et distribuer les recettes de la vente de carbone, conséquence de l'Atténuation;
- Promouvoir clairement l'énergie renouvelable, au moins en éliminant les subventions aux carburants fossiles et, au mieux, en subventionnant les investissements en énergies renouvelables;
- Promouvoir les structures architecturales qui utilisent les matériaux renouvelables, locaux, isolants et à bas coût en énergie, pour toute construction publique et, à travers les subventions ou les facilités fiscales, pour les résidences particulières;
- Dans le secteur de l'agriculture au sens large, aller résolument vers les pratiques agricoles durables, et adaptée, surtout pour l'exploitation familiale et les petits producteurs;
- Pour les grandes fermes privées et publiques, revoir la chaîne de valeur en termes de changement climatique et, surtout évaluer de façon plus rigoureuse et plus complète les nouveaux programmes de biotechnologies, en particulier les OGM.

Section 9. ANNEXES

9.1. Annexes 1: Liste des projets de la composante atténuation de l'INDC

	Coût (en US\$)		Coût (US\$)
INCONDITIONNEL SOUS-TOTAL	1 124 779 259	CONDITIONNEL SOUS-TOTAL	756 032 667
<i>Programme d'investissement forestier</i>	21 645 878	<i>Projet Boisement reboisement équivalent à 3 Programme d'Investissement Forestier (PIF)</i>	64 938 000
<i>Namas SNV</i>	17 710 839	<i>Récupération de méthane à partir des eaux usées de la station d'Épuration de la ville d'Ouagadougou</i>	72 784 000
<i>Foyers Améliorés SNV</i>	196 787	<i>Récupération de méthane à partir des déchets solides du Centre d'enfouissement Technique de la ville d'Ouagadougou</i>	8 444 000
<i>Foyers Améliorés Tipaala</i>	2 230 254	A. Production d'énergie électrique	
<i>Projet biodigesteur National</i>	19 722 922	<i>Petites centrales hydro-électriques [Bontioli (5,1 MW), Gongouro (5 MW) et Folonzo (10,8 MW)]en Partenariat Public-Privé</i>	109 166 667
Production d'électricité		<i>Solaire</i>	163 666 667
<i>Barrage Samendeni</i>	69 710 913	<i>Mini-réseaux à base d'énergie renouvelable et hybride</i>	
<i>Barrage de Ouessa aval</i>	350 000 000	<i>Systèmes PV, Pico-Hydro et petite éolienne</i>	
<i>Barrage Bagré Aval</i>	128 741 379	<i>Bioénergie</i>	12 500 000
<i>Centrale solaire de Zagtoulli (SONABEL)</i>	67 758 621	B. Transport	
<i>Centrale solaire PV de Kaya (SONABEL)</i>	21 666 667	<i>Amélioration plus rapide du parc de véhicule(une réduction de 30 % des consommations en 2025 au lieu des 20 % pour 2030)</i>	3 325 000
<i>Centrale solaire d'Ouaga 2000 (SONABEL)</i>		<i>Substitution de biocarburants aux hydrocarbures: unités de production de bioéthanol (substituer 10 % de la consommation de super en 2030)</i>	94 708 333

Centrale solaire PV de Dédougou (SONABEL)		Substitution de biocarburants aux hydrocarbures: unités de production de biodiesel (substituer 5 % de la consommation de gasoil en 2030)	
Centrale solaire PV de Gaoua (SONABEL)		Résidentiel et Tertiaire	
Centrale solaire PV de Zina		Efficacité énergétique éclairage électrique (résidentiel, EP et tertiaire)	168 750 000
Centrale solaire PV de Diapaga (SONABEL)		Industries	
Centrale solaire de Zagtoulli II (Scatecsolar)		Éfficacité éclairage (Projet de diffusion de 2 millions de LBC dans les secteurs industriels et tertiaires) réduction de 2% par an	52 500 000
Centrale solaire de Kodenii (Canopy) à Pâ		Technologies sobre en énergie (- 3% par an)	5 250 000
Centrale solaire de patte d'oie (Naange)			
Centrale solaire de Zano (Soltech)		Énergie	609 866 667
Centrale solaire de Pâ (Canopy)		Agriculture	64 938 000
Petites centrales hydro-électriques [Bontioli (5,1 MW), Gongouro (5 MW) et Folonzo (10,8 MW)]en PPP	109 166 667	Déchets	81 228 000
Installation de 20 MW solaire PV relié au réseau tous les 10 ans (à partir de 2015)	99 341 667		
Gazogènes (tiges coton) pour la production d'électricité (20 X 250 KW)			
Solaire photovoltaïque(FDE)	72 000 000		
Mini-réseaux à base d'énergie renouvelable et hybride			
Systèmes PV, Pico-Hydro et petite éolienne			
Réduction des pertes du réseau électrique	34 686 667		

Transport	
<i>Transfert modal</i>	1 108 333
<i>Renforcement du projet "Transfert modal dans la ville de Ouaga (sur 20Km)</i>	2 216 667
B. Résidentiel et Tertiaire	
<i>Éfficacité énergétique/introduction des ampoules à faible consommation</i>	6 875 000
<i>Éfficacité énergétique éclairage électrique (résidentiel, EP et tertiaire)</i>	100 000 000

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9.2. Annexes 2: Liste des projets de la composante adaptation de l'INDC

PROJETS D'ADAPTATION (SCÉNARIO ADAPTATION INTEGRÉE)						
Projets	Scenarii	Emissions nette (Gg CO2)	Coût/Investissement (US\$)	Cibles	Nombre de bénéficiaires	Coût projet/bénéficiaire (US\$)
	ADAPTATION SOUS-TOTAL	43 707	5 804 949 915			
SECTEURS A.FO.L.U		43 701	2 840 846 189			
Secteur Agriculture-Eau		5 150	1 233 470 000		17 858 000	69
Restauration et le maintien de la fertilité de 1,575 millions d'ha de terres de culture, par diverses techniques de conservation de l'eau et des sols (CES).		4 662	828 450 000	1 575 000 ha	15 750 000	52,6
Restauration de 150 000 ha de terres dégradées à des fins de production agricole, par la réalisation de 10 000 ha de micro bassins (ou demi-lunes) chaque année		444	63 000 000	150 000 ha	1 500 000	42
L'aménagement de 15 000 ha de bas-fonds et périmètres irrigués et leur mise en valeur par le système de riziculture intensive (SRI)		44,4	8 400 000	15 000 ha	500 000	16,8
Vulgarisation de 15.000 kits d'irrigation «goutte à goutte» en vue de l'irrigation de 3 750 ha à partir d'eau de surface pour la production de culture de haut rapport (exemple tomate ou pomme de terre).		0	105 000 000	3 750 ha	60 000	1 750
Création de 150 Unités d'Intensification des Productions Agricoles (UIPA) à partir de forages à gros débit et utilisant des techniques innovantes d'irrigation (goutte à goutte sous pression)		0	151 200 000	4 000 ha	48 000	3 150
Amélioration de la protection des ressources en eau contre le comblement et les végétaux aquatiques envahissants		0	60 340 000	cibles non quantifiées	ND	
Poursuite des actions de recherche développement dans le domaine de l'eau, de ses usages et des impacts du changement climatique		0	17 080 000	cibles non quantifiées	ND	

PROJETS D'ADAPTATION (SCÉNARIO ADAPTATION INTEGRÉE)						
Projets	Scenarii	Emissions nette (Gg CO2)	Coût/Investissement (US\$)	Cibles	Nombre de bénéficiaires	Coût projet/bénéficiaire (US\$)
Secteur Élevage		21 630	562 080 189		701 000	801,8
Réhabilitation de 1 125 000 ha de terres dégradées à des fins sylvo-pastorales, soit un investissement de 75 000 ha chaque année		3 330	236 250 000	1 125 000 ha	460 000	514
Fauche et la conservation de 10 000 tonnes de fourrage grossier chaque année (foins et résidus de cultures)		0	17 830 189	150 000 tonnes	24 000	743
L'équipement de 75 000 ménages en 2030 avec des biodigesteurs fonctionnels dans au moins 10 régions du Burkina Faso		18 000	189 000 000	75 000 ménages	75 000	2520
Création et la gestion durable de 5 Zones d'Intensification des Productions Animales (ZIPA) dans 5 régions du pays		300	119 000 000	5 ZIPA	142 000	838
Secteur biomasse-énergie		1 220	87 696 000		3 600 000	24,4
Production et diffusion de foyers améliorés en milieu urbain et semi-urbain		610	12 096 000	540 000 foyers ménages sur 15 ans	2 700 000	4,5
Promotion des foyers dolo dans le but de toucher 97% des dolotières à l'horizon 2030		610	75 600 000	180 000 foyers dolo sur 15 ans	900 000	84
Secteur forêts et changement dans l'utilisation des terres		15 700	957 600 000		13 800 000	69,4
Réhabilitation et la mise en défens de 30 000 ha de berges des cours d'eau		60	12 600 000	30 000 ha	1 200 000	10,5
Création et classement de 900 000 ha d'espaces de conservation de la diversité biologique à vocation régionale dans 12 Régions (CT) ou 180 Communes		9 360	504 000 000	900 000 ha	8 400 000	60
Audit des plans d'aménagement de toutes les forêts classées ou protégées en vue de leur actualisation		4 680	252 000 000	450 000 ha	1 200 000	210
Réalisation de 800 000 ha de Régénération Naturelle Assistée (RNA) dans 200 communes rurales		1 600	134 400 000	800 000 ha	3 000 000	44,8

PROJETS D'ADAPTATION (SCÉNARIO ADAPTATION INTÉGRÉE)						
Projets	Scenarii	Emissions nette (Gg CO2)	Coût/Investissement (US\$)	Cibles	Nombre de bénéficiaires	Coût projet/bénéficiaire (US\$)
Développement Participatif de Technologies de Gestion Durable des Terres / Recherche-Développement adaptative aux CC		0	54 600 000	cibles non quantifiées	ND	
AUTRES SECTEURS VULNERABLES (PNA)		7	2 964 103 726			
Secteur de l'urbanisme et de l'habitat		6,5	2 918 154 526		16 017 000	182,2
Cartographie et marquage des zones à risques d'inondation dans les agglomérations de plus de 5000 habitants en adaptation aux changements climatiques		0	167 580 000	399 agglomérations	11 500 000	14,6
Gestion des eaux pluviales et prévention des inondations dans les 13 capitales de région du Burkina Faso		0	2 646 000 000	2 700 km canaux / caniveaux	2 500 000	1 058
Restauration et aménagement de la ceinture verte d'Ouagadougou		6,5	1 176 000	2 100 ha	2 000 000	0,59
Valorisation des matériaux locaux et Promotion d'un habitat sans bois ni tôle en adaptation aux changements climatiques dans les zones rurales et semi-urbaines du Burkina Faso		0,0	98 828 926	19 152 logement privés 2 298 bâtiments communautaires	17 000	5 813
Efficacité énergétique dans l'habitat urbain et rural		0	1 209 600	Gain de 50 Kwh/m2	ND	
Recherche et Développement de Technologies dans l'architecture et la construction en adaptation aux changements climatiques		0	3 360 000	cibles non quantifiées	ND	
Secteur de la santé		0	38 329 200		74 000 000	0,52
Renforcement des capacités de prévision et de réponses aux phénomènes liés aux changements climatiques: ensemble 9 activités		0	4 788 000	cibles non quantifiées	18 500 000	0,26
Développement de la recherche sur la santé et les changements climatiques		0	1 551 200	cibles non quantifiées	18 500 000	0,08
Renforcement des compétences du personnel sur les maladies sensibles aux changements climatiques: formation de 1000 spécialistes		0	23 800 000	1000 spécialistes formés	18 500 000	1,29

PROJETS D'ADAPTATION (SCÉNARIO ADAPTATION INTÉGRÉE)						
Projets	Scenarii	Emissions nette (Gg CO2)	Coût/Investissement (US\$)	Cibles	Nombre de bénéficiaires	Coût projet/bénéficiaire (US\$)
Renforcement des capacités de prévision et de réponses aux phénomènes liés aux changements climatiques: création d'un centre de Veille sanitaire MT		0	8 190 000	1 centre de veille sanitaire	18 500 000	0,44
Alerte précoce pour la gestion des événements climatiques extrêmes		0	7 620 000		37 000 000	0,21
Transfert de technologies pour le suivi climatique, météorologique et environnemental		0	5 229 400	11 stations hydro équipées ; 50 stations automatiques 1 radar réhabilité 1 équipement radiosonde 1 équipement imagerie satellitaire 11 cadres formés	18 500 000	0,28
Intégration de l'utilisation efficace et effective des informations hydrométéorologiques et environnementales dans les plans de développement à long terme pour produire des alertes précoces et saisonnières		0	2 390 600	Cibles multiples	18 500 000	0,13

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REPUBLIC OF BURUNDI

INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC) / BURUNDI

September 2015

1. NATIONAL CONTEXT

Burundi is a landlocked country at the heart of Africa's Great Lakes Region, located between the meridians 29°00'-30°25' East and parallels 2°20'-4°25' South. It has an area of 27,834 km² and belongs to two major river basins: the Nile Basin, accounting for 13,800 km² of the country's territory, and the Congo Basin, covering 14,034 km². Its mostly rural population, with an urbanization rate of around 10.4%, was estimated at 8,053,574 at the time of the 2008 census, with an average density of 310 inhabitants/km².

The Burundian economy is dominated by the primary sector, which accounts for nearly half of its gross domestic product (GDP) and close to 80% of its export income; the secondary sector (industry and handicraft) represents just 17-18% of GDP, and the tertiary sector, only about one third of GDP. The current production structure, dominated by subsistence farming, makes the economy very vulnerable and fragile due to its dependency on climate conditions.

Electrical power consumption in Burundi, amounting to 25 kWh/person/year, represents just 4% of the energy balance.

In Burundi, activities relating to climate change were marked in particular by the development and publication of the first and second national communications under the UNFCCC. At the same time, Burundi also prepared its National Adaptation Programme of Action to climate change (NAPA). The actions identified in the NAPA covered the key sectors of the Burundian economy. As various sectoral adaptation and vulnerability assessment studies have shown, climate change affects every sector of the country's economy, particularly agriculture.

The prospects for sustainable ecological growth were defined through Burundi Vision 2025 and translated into a short term action plan as part of the Growth and Poverty Reduction Strategic Framework covering the period of 2012-2015. In the medium to long term, the Government plans to engage in a transition toward a green economy. Burundi Vision 2025 makes a firm commitment to prioritizing the country's protection and rational management of the environment such that Burundians can live in a protected, properly managed setting.

The Government has stated its *vision* of the fight against climate change as follows: ***"A State that promotes development that is resilient to the harmful effects of climate change"***.

At the institutional level, the Ministry of Water, the Environment, Land Management and Urban Planning, with its departments and personalized institutions such as IGEBU and OBPE, handles matters relating to climate change. For the fulfilment of its mission, the Ministry enjoys the support of frameworks for dialogue such as the National Environment Commission, the Sectoral Group on Water, Sanitation and the Environment (GSEAE), the National Water Partnership (PNE-Bu), and the National Platform for Risk Prevention and Disaster Management.

In the framework of its Intended Nationally Determined Contribution (INDC), Burundi intends to reaffirm its determination to contribute to global efforts to reduce greenhouse gas emissions and to strengthen its resilience to climate change while continuing to meet its own development challenges.

2. ADAPTATION

2.1. Climate change impacts and vulnerability

Studies conducted for the initial national communication on climate change and the evolution of climate parameters in Burundi through 2050, based on the general circulation model, show that the average annual temperature will increase by 1°C to 3°C. Rainfall will rise by roughly 10%, and the precipitation regime will be disrupted such that there will only be two seasons remaining, each lasting six months: a rainy season from November to April, followed by a dry season.

These climate changes will engender a large number of risks associated with the following phenomena: (i) season creep; (ii) flooding of swamps and lowlands; (iii) land degradation and loss of soil fertility; (iv) shortage of groundwater resources; (v) extreme weather events (hail, violent showers, heavy winds, etc.); (vi) changes to the growing seasons of crops and forests; and (vii) unpredictable movements of pests.

According to an integrated analysis of Burundi's vulnerability, conducted as part of the ACCES (Climate Change Adaptation for Soil and Water Resources Conservation) Project, it was found that the country's "hotspots of vulnerability" are located in the north and northwest. The slope of the ridge (and not the ridge itself) leading to the Imbo Plain to the west, the topographical structures to the north and the central plateau are the regions most vulnerable to erosion. The main causes are the highly variable relief and the pronounced sensitivity of those regions to climate variability.

Table 1: Major impacts relating to climate change in Burundi (Source: NAPA 2007)

<i>Sector</i>	<i>Impacts</i>
Water	<ul style="list-style-type: none"> ▪ Drying up of lakes and other waterways, and disappearance of aquatic flora ▪ Deterioration of surface water quality ▪ Increased rainwater erosion and silting of certain rivers ▪ Decline in production by hydroelectric power plants ▪ Increased competition for the use of unpolluted groundwater resources
Energy	<ul style="list-style-type: none"> ▪ More frequent shutdowns of certain active hydroelectric power plants because of exceeding operating thresholds due to insufficient rainfall and prolonged drought ▪ Complete silting of certain dams due to heightened erosion caused by more abundant precipitation leading to the complete shutdown of a few hydroelectric power plants, the most endangered among them being the Marangara, Buhiga and Kayenzi plants ▪ More frequent flooding of electricity production infrastructure like in Mugere, leading to production shutdowns for longer periods of time ▪ Increased runoff from land degradation in the hydroelectric power plants' watersheds ▪ Major fluctuations in electricity production due to stresses on the water supply system and changes in rainfall patterns ▪ A larger deficit in the electricity sector leading to real electrical power supply problems in the country's various socioeconomic domains ▪ Widespread scarcity of firewood and wood charcoal due to heightened, combined pressure from human activities, rising temperatures and changes to biomass growth rates
Agriculture and livestock farming	<ul style="list-style-type: none"> ▪ Declines in harvests, cattle, goats, sheep and poultry aggravated by more prolonged, more frequent drought with likelihoods of occurrence of between 40% and 60%

	<ul style="list-style-type: none"> ▪ Meat and dairy production yields will be even more heavily affected and reduced, along with fish production in the event of drought ▪ Lightning appearing during tornadoes will increase, causing additional livestock deaths in mountainous areas ▪ Decline in the quality and quantity of pastureland
Health	<ul style="list-style-type: none"> ▪ Increased number of cases of malaria
Landscapes	<ul style="list-style-type: none"> ▪ Risk of more frequent, larger scale flooding of lowlands ▪ Escalation of soil erosion along groundwater trenches in the watersheds of the MirwaMountains ▪ The levels of Lakes Cohoha, Rweru, Rwihinda and Kanzigiri in the Bugesera Depression could further decrease with the intensification of drought, with their waters retreating at above 400 m, which has already been seen toward the centres of those lakes and puts some of the shallower ones at risk of completely disappearing ▪ The level of Lake Tanganyika will rise due to heavy precipitation
Terrestrial ecosystems (forests)	<ul style="list-style-type: none"> ▪ Disappearance of the subalpine zone starting at an elevation of 2,450 m ▪ Disappearance of certain plant species and aggravation of erosion and bush fires ▪ Degradation of the groves in Bugesera and forests of Hyphaene palm trees on the Ruzizi Plain, with an increased vulnerability to bush fires

2.2. Adaptation needs

To reduce Burundi's vulnerability and boost its resilience, the country's needs have been identified. These relate to human, institutional, technical and financial capacity-building, as well as technology transfers.

a) Human and institutional capacity-building needs

The country needs to:

- Inform, educate and communicate about the climate, climate risks and adaptation technologies (development of the population's reactivity);
- Strengthen the aptitudes of actors (especially women and farmers) in new technical processes, in the interest of intensified, sustainable production methods (new crop systems and techniques);
- Encourage technology transfers between research institutes and agro-sylvo-pastoral actors;
- Support institutions in defining adaptation priorities by socioeconomic sector and foster inter-sectoral consistency, namely during the development of the National Adaptation Plan.

b) Technical and technology transfer needs

Need	Objectives and Description
<i>Key measure: Development of access to water while enhancing the efficiency of its use</i>	
Water resources control and management	<ul style="list-style-type: none"> - Develop, rehabilitate and manage hydroagricultural developments - Produce developments for rain-fed crops - Develop small and large scale irrigation and improve its efficiency in order to reduce water consumption
<i>Key measure: Promotion of intensified water-efficient agriculture</i>	
Intensification and diversification of agricultural production	<ul style="list-style-type: none"> - Intensify and diversify agricultural production by simplifying access to inputs (fertilizer, subsistence crop seeds, drought-resistant fodder and crop protection products) and to agricultural equipment - Develop an agro-ecological approach (soil fertility management practices, use of manure and compost, development of agroforestry, and water and soil conservation)
<i>Key measure: Security for animal and fishing production, and promotion of associations</i>	
Security for livestock farming and support for the association of agriculture and livestock	<ul style="list-style-type: none"> - Enable the diversification of activities (breeding of multiple species of animals, combination of agriculture and livestock, sale of harvest transport services, fodder crops, etc.) - Facilitate the genetic diversity of different animals
Support for the exploitation of fishing resources	Develop the exploitation of fishing resources while conserving resources (stocking bodies of water with fish, development of rain-fed fish farming and application of zones closed to grazing)
<i>Key measure: Support for facilities that use renewable energy sources</i>	
Improvement of the population's well-being	Improve agricultural and livestock production activities (drainage, conservation, drying and cold chain) including the use of renewable energy sources (hydraulic, solar and wind)
<i>Key measure: Communications on climate risks and adaptation scenarios</i>	
Knowledge of spatial and temporal changes to the environment	<ul style="list-style-type: none"> - Track weather forecasts and the climate - Prevent and fight bio-aggressors - Use information networks to identify areas ravaged by disease and/or with major water and pastureland resources

2.3. National priorities for adaptation to climate change

Specifically concerning adaptation to climate change, the priorities are outlined in the following documents:

- National Adaptation Programme of Action (NAPA, 2007);
- National Climate Change Policy (2012);
- National Strategy and Action Plan on Climate Change (2012).

Table 2: Sectoral policies and strategies in place for adaptation to climate change

Sector	Current Policy and Strategy Documents	Priorities
Water	<ul style="list-style-type: none"> ▪ National Water Resources Management Policy and Action Plan (2001) ▪ Water Code (Law 1/02 of 26/03/2012 enacting the Water Code in Burundi) 	<ul style="list-style-type: none"> ▪ Water control with a view to increasing agricultural and livestock production ▪ Human resources capacity-building in the field of water
Energy	<ul style="list-style-type: none"> ▪ Sectoral Strategy for the Energy Sector in Burundi (2011) ▪ Law 1/13 of 23 April 2015 reorganizing the electricity sector in Burundi 	<ul style="list-style-type: none"> ▪ Hydroelectrical production through developments adjusted to align with the successive growth phases of the Burundian economy
Forestry	National Forestry Policy of Burundi (2012)	<ul style="list-style-type: none"> ▪ Development and rational management of forest resources: raising the forest cover rate to 20% by 2025 ▪ Promotion of forest resources ▪ Human and institutional capacity-building
Agriculture & Livestock	<ol style="list-style-type: none"> 1. National Agricultural Strategy, 2008-2015 (2008) 2. National Sustainable Land Use Strategy (2007) 3. National Action Programme to Fight Land Degradation (2005) 	<ul style="list-style-type: none"> ▪ Increase in agricultural production and productivity and development of sustainable production systems than can re-establish food self-sufficiency in the short and medium terms ▪ Management and sustainability capacity-building in the agricultural sector in order to transform subsistence farming into profitable market agriculture managed by professionals ▪ Introduction of smart agriculture

2.4. Priority adaptation programmes

The following programmes were identified as part of the National Strategy and Action Plan on Climate Change (2012):

Programme name	Components
Climate risk adaptation and management	<p>Integrated water resources management by a small hydrological unit</p> <p>Integrated management of climate risk and forecasts over time (by means of probabilities and forward-looking studies) so as to be able to take action in advance</p> <p>Protection of aquatic and land-based ecosystems</p> <p>Coaching of the population to develop their resilience to climate change</p> <p>Development of institutional and operational capacities to coordinate programmes that are resilient to climate change</p> <p>Research on the vulnerability and adaptation of socioeconomic sectors to climate change</p> <p>Establishment of functional monitoring and evaluation mechanisms for climate change, as well as knowledge management and information mechanisms</p> <p>Research and extension of drought-resistant forest species</p> <p>Promotion of climate-smart agriculture (agrometeorology)</p>
Capacity-building, knowledge management and communication	<p>Enhancement of data and information management and distribution mechanisms</p> <p>Reinforcement of climate change impact tracking systems by means of observations and investigations</p> <p>Improvement of scientific and technological research on adapting to climate change, supported by climate observations</p> <p>Improvement of the legislative and regulatory framework for handling climate change as part of investment programmes and the promotion of public-private partnerships</p> <p>Strengthening of the information and data communication and exchange system</p>

2.5. Current initiatives to support adaptation

- ACCES (Climate Change Adaptation for Soil and Water Resources Conservation) Project, financed by the Special Fund for Energy and Climate
- Watershed Management and Climate Resilience Improvement (PABVARC) Project
- Communication and Early Warning Strategy for Adaptations to Climate Change
- Integration of smart agriculture into the National Agricultural Investment Programme (NAIP)
- National Action Plan (currently being drafted)
- Various GEF small grants projects

3. MITIGATION

In terms of mitigation, the desired INDC for Burundi should make it possible to meet the sustainability objectives defined in national policies and strategies.

		Expected rate of reduction
Type of contribution	Unconditional contribution	> Reduction of greenhouse gas emissions by 3% compared to the business-as-usual (BAU) scenario for 2030
	Conditional contribution	> Reduction of greenhouse gas emissions by 20%, beginning in 2016, compared to the business-as-usual scenario for 2030
Baseline year		> 2005
Target year		> 2030
Total reduction in emissions by 2030		> 1,958 Gg CO ₂ e for the unconditional objective and 14,897 Gg CO ₂ e for the conditional objective

3.1. Business-as-usual scenario and emissions reduction objectives

The table below presents the emissions for the baseline year and the business-as-usual (BAU) scenario, the emissions for the unconditional objective and the emissions for the conditional objective, whose implementation will depend on the financial support of the international community.

a) Unconditional objective

Under the National Reforestation Programme, Burundi has undertaken to increase its carbon dioxide gas well through 4,000 hectares of annual reforestation over the course of 15 years, beginning in 2016.

In the energy sector, Burundi is in the process of building three hydroelectric power plants. This programme will increase the country's electrification rate to 35%.

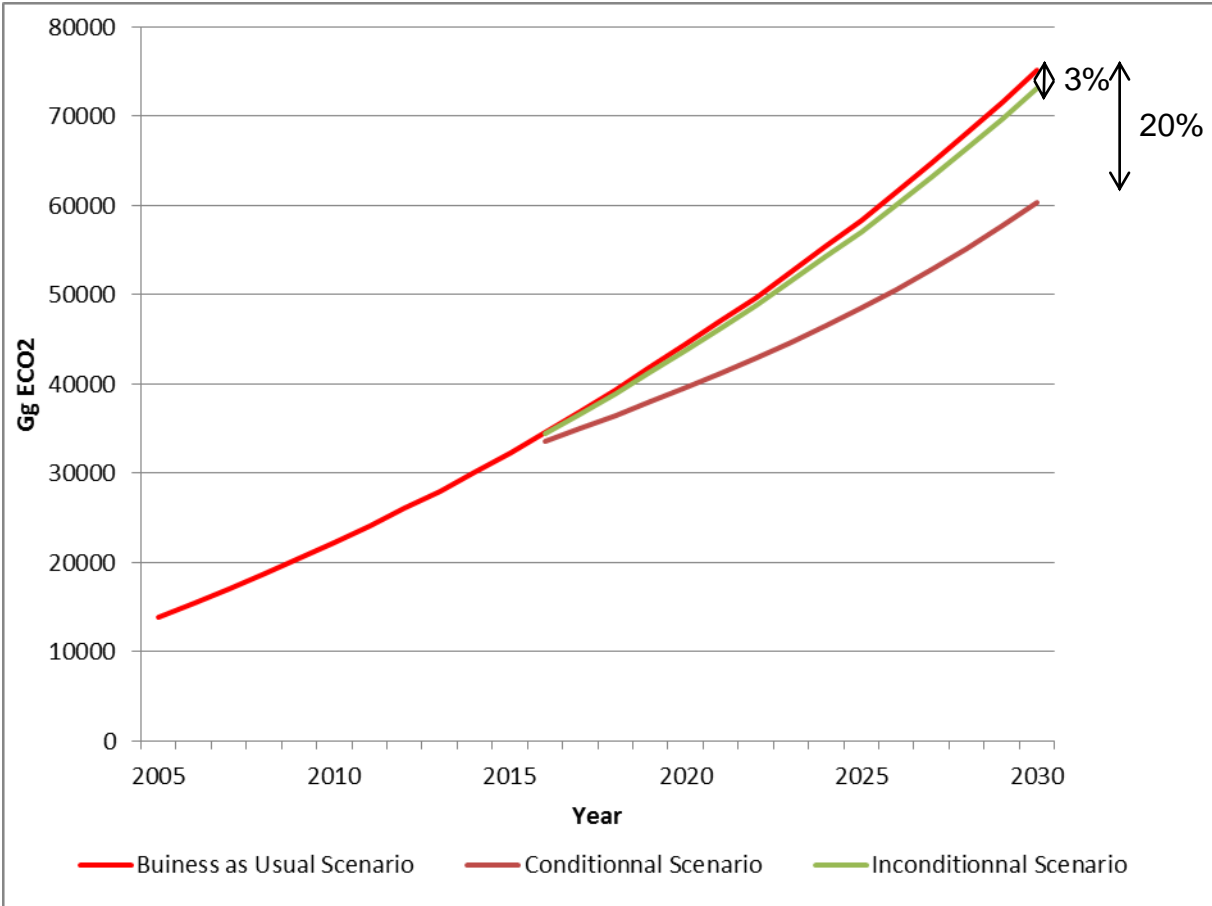
b) Conditional objective

- Forestry:(i) reforestation of 8,000 ha/year during 15 years, beginning in 2016; (ii) replacement of 100% of traditional charcoal kilns and traditional home ovens by 2030;
- Agriculture: gradual replacement of 100% of mineral fertilizers with organic fertilizer by 2030.

Table 3: Emissions by mitigation objective

OBJECTIVE	Percentage	CO ₂ e emissions (Gg)
Unconditional objective (2030) %	3%	1,958
Conditional objective (2030) %	20%	14,897
Unconditional objective (2025) %	2%	1,305
Conditional objective (2025) %	17%	9,897
Unconditional objective (2020) %	1%	653
Conditional objective (2020) %	11%	4,897

Mitigation objectives for 2030



3.2. Scope and scale of the contribution

Table 4: Scope and scale of the contribution

Sector	Gas(es)	Sub-sector(s)	Geographic scope
Energy	CO ₂ , CH ₄ and N ₂ O	Fuel combustion activities	Nationwide
Agriculture & livestock	CH ₄ and N ₂ O	Agricultural soils	Nationwide
Land use and forestry	CO ₂	Forestland	Nationwide

3.3. Assumptions and methodology

The choice of assumptions is guided by the development planning orientations defined in Burundi Vision 2025 and the national operationalization policies and strategies for the Vision.

The GHG inventories were performed on five modules identified by the IPCC: Industrial Processes, Energy, Agriculture, Land Use, Land Use Change and Forestry (LULUCF), as well as the Waste module.

100 years of GWP values were used for the conversion to CO₂ equivalents (IPCC Assessment Report). These numbers were 21 for CH₄ and 310 for N₂O.

The policy documents that take GHG emissions generating activities into consideration - and that were used to formulate the assumptions and objectives - appear in Table 5.

Table 5: Documents used to formulate assumptions and objectives

Sector	Current Policy and Strategy Documents
Energy	Sectoral Strategy for the Energy Sector in Burundi (2011) National Environment Strategy (SNEB, 1997)
Land use and forestry	National Forestry Policy of Burundi (2012) National Strategy and Action Plan for Biodiversity (2013-2020)
Agriculture	National Agricultural Strategy, 2008-2015 (2008) National Sustainable Land Use Strategy (2007) National Action Programme to Fight Land Degradation (2005) National Strategy and Action Plan to Fight Soil Degradation (2011-2016) National Agricultural Investment Plan (2012-2017)
	Vision Burundi 2025 Strategic Framework for Growth (2012)
All sectors	First and second national communications on climate change (2001 and 2010) National Adaptation Plan of Action to climate change (2007) Summary report on greenhouse gas inventories (2009) Summary report on GHG emissions mitigation studies (2009) National Climate Change Policy (2013) National Strategy and Action Plan on Climate Change (2013)

3.4. Emissions compensation

In terms of compensation for any loss of revenue or for the restriction of certain economic activities due to the implementation of the INDC programme, Burundi will rely on international greenhouse gas emissions compensation mechanisms and on current national legislation.

In terms of forestry in particular, the plan is to promote the development of ecosystem services.

3.5. Verification/counting methods

Concerning carbon counting and verification methods, Burundi will conform to the IPCC's guidelines.

3.6. Ambitious, equitable nature of the planned contribution

Limiting the rise in GHG emissions presents a major challenge for Burundi, in view of its national context. Economically, Burundi is ranked a least developed country (LDC), with per capita GDP of US \$282 (in 2012).

Burundi also has significant structural vulnerability due in particular to the country's landlocked status and its exposure to weather and natural hazards. According to United Nations statistics, Burundi's economic vulnerability index is 56.81 compared with an average of 45.7 in 2012 across all of the least developed countries. Faced with these development challenges, Burundi's contribution is an ambitious one, as it

plans for a 3% reduction in its emissions by 2030 for the unconditional scenario, and by 20% by that same year for its conditional objective.

4. CONTRIBUTION IMPLEMENTATION METHODS

4.1. Institutional arrangements for implementation

The Government of Burundi will implement the INDC through the Ministry of the Environment, which is the government institution in charge of ensuring the implementation of international conventions relating to the environment. It will use its customized departments and institutions like IGEBU and the OBPE, which handle questions associated with climate change, but also frameworks for dialogue such as the National Environment Commission, the Sectoral Group on Water, Sanitation and the Environment (GSEAE), the National Water Partnership (PNE-Bu), and the National Platform for Risk Prevention and Disaster Management.

4.2. Capacity-building

Despite the non-negligible step already taken to create and build capacities, national experts are still insufficient and have not yet acquired significant proficiency in the tools and methodologies available to produce GHG emissions inventories, climate change vulnerability and adaptation studies, and GHG emissions mitigation studies, as well as solid proficiency in the procedures used to compile financing applications for the available funding mechanisms. As a result, capacity-building will be needed to offset the following:

- Insufficient climate data due to outdated facilities;
- Insufficient scientific personnel able to satisfactorily run programmes and research topics linked to climate change;
- Difficulty training technical and scientific personnel on-site or abroad due to the non-existence of training institutions specializing in climate in Burundi and limited cooperation with the outside world;
- Insufficient quality and quantity of domestic technical expertise.

4.3. Technology transfer needs

Burundi does not have the technical resources to do research and development in the field of climate change and has no national programme on the subject. As part of the INDC's implementation, Burundi's technology transfer actions will pertain to:

- Promoting research and development, adopting new technologies, and harnessing them for the national context;
- Reinforcing the operations of certain organizations and institutions involved in climate change;
- Skills training, education and international cooperation.

4.4. Consideration of gender, youth and vulnerable groups

Gender, youth and vulnerable groups are concerns that have not always been taken into account in Burundi's national and sectoral socioeconomic development plans. In its Vision 2025, the Government of Burundi considers these to be cross-cutting issues to be incorporated into all development programmes. The same will apply to implementation of the INDC.

4.5. Need for financial support

As was underscored above, most of the climate change adaptation actions identified in previously developed national and sectoral action plans have not yet been implemented for want of the financial means to do so. The table below summarizes the financial needs for implementation of the INDC in the form of programmes.

Table 6: Programmes and costs associated with implementation of the INDC (Source: National Strategy and Action Plan on Climate Change, 2012)

Programme Name	Components	Cost (in US\$K)
Climate risk adaptation and management	<ul style="list-style-type: none"> ▪ Integrated water resources management by a small hydrological unit ▪ Protection of aquatic and land-based ecosystems ▪ Coaching of the population to develop their resilience to climate change ▪ Development of institutional and operational capacities to coordinate programmes that are resilient to climate change ▪ Research on the vulnerability and adaptation of socioeconomic sectors to climate change ▪ Establishment of functional monitoring and evaluation mechanisms for climate change, as well as knowledge management and information mechanisms ▪ Research and extension of drought-resistant forest species 	3,719
Mitigation of greenhouse gas emissions and low carbon developments	<ul style="list-style-type: none"> ▪ Development of hydroelectricity ▪ Decentralized rural electrification through the use of photovoltaic systems ▪ Energy efficiency in production, transport, distribution and consumption (reduction of losses, low energy light bulbs and energy saving equipment) ▪ Peat carbonization, and densification and carbonization of coffee husks, rice hulls and sawdust ▪ Distribution and dissemination of improved ovens ▪ Intermittent drainage in rice cultivation ▪ Composting of waste from the defoliation of sugar cane plantations ▪ Recovery of the fermentable fraction of urban waste that can produce compost and biogas ▪ REDD pilot programme 	1,446,118

Promotion of research & development and technology transfers	<ul style="list-style-type: none"> ▪ Development of small scale hydro-power (Pico hydro, water wheels, etc.) ▪ Resumption of research and development, distribution and extension of renewable energies (biogas, wind power and gasification) ▪ Urban waste recovery techniques ▪ Urban transit with low GHG emissions ▪ Adaptation of agriculture to climate change ▪ Waste recovery techniques for agriculture, forestry and livestock farming 	25,787
Capacity-building, knowledge management and communication	<ul style="list-style-type: none"> ▪ Improvement of sustainable forest and reforestation management methods and techniques ▪ Enhancement of data and information management and distribution mechanisms ▪ Reinforcement of climate change impact tracking systems ▪ Improvement of scientific and technological research on mitigating and adapting to climate change ▪ Design and set-up of a national REDD monitoring, reporting and verification mechanism, plus other actions relating to climate change ▪ Improvement of the legislative and regulatory framework for handling climate change as part of investment programmes and the promotion of public-private partnerships ▪ Strengthening of the information and data communication and exchange system 	3,465
Reforestation and agroforestry ¹	<ul style="list-style-type: none"> ▪ Reforestation of terrains on steep slopes ▪ Colonization of terrains on mild slopes through agroforestry 	10,000
Extension of improved kilns ¹	<ul style="list-style-type: none"> ▪ Training of charcoal producer on building and using improved kilns 	1,500
Extension of improved domestic and artisanal ovens ¹	<ul style="list-style-type: none"> ▪ Training of craftsmen on producing improved ovens (metal and pottery) ▪ Awareness raising and promotion of improved ovens for the home and crafts industries (brickworks, tile factories, restaurants, etc.) 	3,000

¹Communal forest management plan (MEEATU/PPCDR, 2013).

ANNEX: List of Acronyms and Abbreviations

ACCES:	Climate Change Adaptation for Soil and Water Resources Conservation Project
CC:	Climate change
CDM:	Clean Development Mechanism
CO ₂ e:	Carbon dioxide equivalent
GDP:	Gross domestic product
Gg CO ₂ e:	Gigagram of carbon dioxide equivalent
Gg:	Gigagram
GHGI:	Greenhouse gas inventory
GSEAE:	Sectoral Group on Water, Sanitation and the Environment
IGEBU:	Geographic Institute of Burundi
INDC:	Intended Nationally Determined Contribution
INECN:	National Institute for the Environment and Nature Conservation
IPCC:	Intergovernmental Panel on Climate Change
LULUCF:	Land use, land use change and forestry
MEEATU:	Ministry of Water, Environment, Land Management and Urban Planning
NAPA:	National Adaptation Programme of Action
OBPE:	Burundian Office for the Protection of the Environment
SFPR:	Strategy Framework for Poverty Reduction
UNFCCC:	United Nations Framework Convention on Climate Change



REPUBLIC OF CABO VERDE



United Nations
Framework Convention on
Climate Change

INTENDED NATIONALLY DETERMINED CONTRIBUTION OF CABO VERDE



INTENDED NATIONALLY DETERMINED CONTRIBUTION OF CABO VERDE

The “Intended Nationally Determined Contribution” (INDC) of Cabo Verde is hereby submitted jointly by the Ministry of Environmental, Housing and Land Planning and by the Ministry of Foreign Affairs with a view to contribute to the process of the 21st Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) to be held in Paris in December 2015.

It responds to COP decisions 1/CP.19 and 1/CP.20 inviting all Parties to communicate to the secretariat their INDCs so as to achieve the objective set out in Article 2 of the UNFCCC and in a way that demonstrates a progression beyond their current undertakings. The submission draws attention to the fact that Cabo Verde is a small island developing state (SIDS) and that the strategies, plans and actions for low greenhouse gas emission (GHG) development put forward herein reflect the special circumstances and adaptation challenges of Cabo Verde, which require specific international support in terms of capacity-building, technology transfer, and financial commitments.

The preparation of this document was coordinated by the National Directorate of Environment and is structured as follows: (i) summary of contributions; (ii) national context and overall vision; (iii) mitigation; and (iv) adaptation.

Cabo Verde’s mitigation contributions listed herein are expressed in the form of Renewable Energy (RE) and Energy Efficiency (EE) Targets and other Nationally Appropriate Mitigation Actions (NAMAs). RE and EE Targets are proposed for both 2025 and 2030, along with biennial monitoring of progress based on pre-defined indicators and supported by GHG inventories.

Where expressly indicated, the mitigation contributions and adaptation measures proposed are unconditional unilateral efforts. All other contributions proposed are conditional upon receipt of adequate, timely and predictable international support. Cabo Verde supports the use of market-based mechanisms to implement and achieve the conditional portion of the contributions mentioned in this document.

Finally, Cabo Verde will update, as appropriate, its INDC to account for the most recent GHG inventory currently being prepared as part of Cabo Verde’s Third National Communication process, expected to be concluded in the second half of 2016.

This INDC demonstrates Cabo Verde’s continued commitment to sustainable, low-carbon and climate resilient policies and the country’s contribution to global efforts to reduce emissions and limit the increase in global average temperatures to 2°C or 1.5°C above pre-industrial levels.

I. Summary of contributions

In order to facilitate clarity, transparency and understanding, this first section presents a summary of Cabo Verde's intended mitigation and adaptation contributions.

Cabo Verde strongly believes that, in light of its national circumstances, in particular its position as an arid small island developing states (SIDS) particularly vulnerable to climate change, its INDC is fair, ambitious, and represents a genuine contribution towards achieving the objective of the Convention as set out in its Article 2.

Table 1- Summary of contributions

Types of contribution	Both target and action-based contributions, tailored to Cabo Verde's special circumstances. Where indicated, the mitigation and adaptation measures proposed are unconditional, domestically realised commitments. All other contributions proposed herein are conditional upon receipt of adequate and predictable international support.
Coverage and scope	Specific priorities: <ul style="list-style-type: none">▪ Sectors: Energy, transport, waste, AFOLU (Agriculture, Forestry and Other Land Use), and adaptation.▪ GHGs: carbon dioxide (CO₂); methane (CH₄); and nitrous oxide (N₂O).
Time dimension of contributions	2025 and 2030
Planning processes	<p>Cabo Verde's planning process is anchored on a wide participatory and societal approach and has been shaped by a core set of programmatic documents, including:</p> <ul style="list-style-type: none">▪ Cabo Verde's Transformational Agenda for 2030;▪ National Energy Efficiency Plan of 2015 (PNAEE);▪ National Renewable Energy Plan of 2015 (PNAER);▪ The Strategic Water and Sanitation Plan ("PLENAS");▪ Growth and Poverty Reduction Strategy Paper (DCRP III); and▪ Cabo Verde's Low Carbon and Climate Resilient Development Strategy (in preparation). <p>Cabo Verde is committed to implement the Sustainable Energy for All (SE4all) agenda and – as host to the ECOWAS Regional Centre for Renewable Energy and Energy Efficiency (ECREEE) – intends to assume regional leadership on energy transformation in Africa.</p> <p>Cabo Verde has recently signed together with the European Union, Luxembourg, Spain, Portugal and Austria a Joint Declaration on Reinforced Cooperation in the Field of Sustainable Energy. The cooperation will support Cabo Verde on its pathway to universal energy access and enhanced electricity supply from 100% renewable energy sources.</p> <p>Cabo Verde's national efforts and ambitions respond to</p>

the process of the Durban Platform as well as to the Barbados Programme of Action for the Sustainable Development of SIDS, the Samoa Pathway, and the Post-2015 Development Agenda.

Fair and ambitious

As a small island development state (SIDS), Cabo Verde has one of the lowest GHG emissions per capita and yet is among the countries most vulnerable to climate change. In particular, Cabo Verde faces severe adaptation challenges associated with water resources availability, food and energy security, and desertification processes.

In light of these circumstances and according to the country's capacities, Cabo Verde believes its conditional and unconditional contributions to be fair and ambitious, effectively contributing to collective global efforts to reduce emissions and limit the increase in global average temperatures to 2°C or 1.5°C above pre-industrial levels.

Mitigation (target-based) **(target-based)** Renewable Energy

Cabo Verde makes an unconditional commitment:

- to achieve 100% grid access by 2017; and
- to achieve a 30% renewable energy penetration rate into the electric grid by 2025.

With international support, Cabo Verde seeks to increase the renewable energy uptake in electricity to 100% by 2025, with best efforts to achieve this goal already by 2020, in accordance with the following indicative trajectory:

- 35% RE penetration rate in 2016-2018;
- 50% RE penetration rate in 2018-2020;
- 100% RE penetration rate in 2020-2025.

To achieve this goal, the following key measures are envisaged:

- smart-grid enhancement for the country's 9 independent networks with state-of-the-art power conditioning, production and distribution control;
- built-up of energy storage facilities (including through batteries and flywheels);
- design of renewable micro-grids;
- design of individual energy systems (solar home systems); and
- systematic deployment of solar-water-heaters across all islands.

The ambitious renewable energy roadmap will require close planning in public-private partnerships, simplified procedures for licensing and certification ("one-stop-shops") and the creation of robust competitive market conditions and the consideration of specific fiscal incentives to attract the private sector.

To reach the above indicative targets, investments in the order of 310 million EUR (50% RE penetration) and 1 billion EUR (100% RE penetration) will be needed.

Cabo Verde estimates that the renewable energy target will generate annual GHG emission reductions in the range of 600-700 tCO₂eq.

Energy Efficiency	<p>Cabo Verde makes an unconditional long-term commitment to reduce overall energy demand by 10% in relation to the Base Scenario by 2030.</p> <p>With international support, Cabo Verde seeks to reduce overall energy demand by 20% in relation to the Base Scenario by 2030, with best efforts to achieve this indicative reduction effort already by 2025.</p> <p>To achieve these goals, the following key measures are envisaged:</p> <ul style="list-style-type: none"> ▪ seeking to reduce the proportion of technical and non-technical losses in energy distribution from about 25% in 2010 to less than 8% by 2030 or before; ▪ improving energy efficiency of large consumers, with particular focus on hotels, hospitals and public administration offices by 2030 or before, including through mandatory installation of solar-water-heater components; ▪ achieving 30% of efficiency improvement in the use of electric power (15% residential, 15% commercial); ▪ improving by at least 10% fuel-usage across sectors and modes of application (except butane usage) by 2030 or before; ▪ improving energy performance of the building envelop and implementing a green building code, seeking to cover all new (public or private) buildings by 2030 or before; ▪ enhancing energy efficiency of street lighting and creating energy rating labels for domestic appliances and air conditioning by 2030 or before; ▪ further promoting the use of smaller distributed energy solutions (e.g. solar pumps) for water pumping, distribution and irrigation; ▪ promoting the built-up of a comprehensive network of energy services companies (ESCOs) and clean-energy business incubators.
Base Scenario	<p>The Base Scenario for the overall energy demand until 2030 considered the historical evolution and relevant variables associated with energy use, population and economic growth. It projects a moderate annual growth rate in energy demand of around 2% until 2020, increasing to 3% per year from 2020 to 2030.</p> <p>The overall energy demand in 2030 under the Base Scenario is estimated to be around 2,700GWh.</p>
Estimated GHG reductions	<p>The overall GHG reductions corresponding to Cabo Verde's energy sector-related goals and other intended mitigation contributions will be calculated and updated once the 3rd National Communication and GHG inventory is concluded (second half of 2016).</p>
Assumptions and methodologies	<ul style="list-style-type: none"> ▪ According to Cabo Verde's Base Scenario for the energy sector as presented in the 2020/2030 National Renewable Energy Plan and the National Energy Efficiency Plan; ▪ Methodologies for estimating GHG emissions: IPCC Guidelines 2006; and ▪ Global Warming Potential on a 100 year

timescale in accordance with the IPCC's 4th Assessment Report.

Other mitigation contributions (NAMAs)

Transport

Seek to develop a NAMA that increases energy efficiency of the transport sector, including domestic shipping and domestic air travel, and evaluates options for policies and actions available to reduce the impact of GHG emissions originating from this sector.

The NAMA will initially be focused on the collection of relevant data for the sector, including, among others, fuel type and consumption per transport mode, technology performance, fuel substitution possibilities, estimation of costs, and an updated GHG emissions profile for light-duty vehicles as well as for freight and passenger transportation services.

This NAMA will also consider options for boosting hybrid and electric fleet in the country, in particular, the feasibility of making government vehicles electrically powered by 2030.

Forestry

Cabo Verde makes an unconditional long-term commitment to engage in new afforestation/reforestation ("A/R") campaigns in the order of 10,000 hectares by 2030.

With international support, Cabo Verde seeks an A/R campaign area of around 20,000 hectares until 2030.

We estimate a planting effort of 400 trees per hectare. If 20,000 hectares are successfully planted, this will generate a long-term sequestration gain of 360 tCO₂eq per hectare sequestered after 30 years, corresponding to 7.2 mtCO₂eq for 20,000 hectares after 30 years.

Cabo Verde also aims at eliminating three stone cooking stove (35% of households still use three-stone stove) through improved low-emissions cookstoves by 2025 at the latest, and thereby substantially removing demand for firewood.

At the level of governance and institutional infrastructure, Cabo Verde seeks to improve overall forestry governance by investing in inventory and land registry systems, designating priority afforestation/reforestation, and preparing long-term sustainable land management plans coupled with performance-based subsidies.

Waste

Seek to provide proper waste management coverage (with waste segregation, recycling, and treatment in sanitary landfills) for at least 50% of the more vulnerable municipalities by 2030, including:

- implementing educational programs for the separation of basic waste types by households and waste producers;
- planning and building 5 waste collection and recycling facilities and/or general drop off points by 2025;
- planning and building at least 1 landfill equipped with gas-to-energy systems by 2025; and
- developing stand-alone bio-energy solutions.

Seek to promote the use of the resulting sludge from the wastewater treatment process for the production of clean

		<p>energy;</p> <p>Seek to further develop and implement the Waste Roadmap for Cabo Verde, as well regulate and implement the new General Solid Waste Law;</p> <p>Seek to further develop and implement the water and sanitation master plans (“Planos Diretores de Água e Saneamento - PDAS”), as well as regulate and implement the new Water and Sanitation Code; and</p> <p>Seek to improve governance, institutional and technical capacities by:</p> <ul style="list-style-type: none"> ▪ collecting and organizing relevant data on waste generation; ▪ designing an inter-municipal integrated waste management system; and ▪ capacitating the public sector to engage with private sector operators and technology providers.
Adaptation contributions	Key strategic axes	<ul style="list-style-type: none"> ▪ Promoting integrated water resources management, guaranteeing stable and adequate water supply (for consumption, agriculture, ecosystems and tourism); ▪ Increasing adaptive capacities of agro-silvo-pastoral production systems in order to ensure and improve national food production and promoting Cabo Verde’s ocean-based (“blue”) economy; ▪ Protecting and preventing degradation of coastal zones and their habitat.
	Proposed measures	<p>Seek to ensure by 2030:</p> <ul style="list-style-type: none"> ▪ that every citizen has safe access to a minimum of 40l potable water per day; ▪ that all urban households are connected to the water supply network; ▪ that sewage collection system and proper disposal is extended to cover at least 90% for the cities of Praia and Mindelo and at least 50% of rural areas; ▪ the construction (or retrofitting/expansion) of at least 4 wastewater treatment plants and water re-use facilities. <p>Seek to establish a systematized electronic database for storage and management of relevant water-related information as well as a framework for measuring, reporting and verification (MRV) to assess water-relevant data and to better evaluate performance in the sector;</p> <p>Seek to build several new desalination and water pumping units. With progressive increase of RE penetration in the grid, overall energy costs are expected to reduce, decreasing also potable water supply and irrigation costs. Decentralized renewable energy solutions and more efficient technologies will also be considered and tested by Cabo Verde;</p> <p>Seek to promote new water storage and distribution techniques and to build at least 5 new dams by 2030;</p> <p>Seek to develop water and sanitation master plans (“planos diretores”) for each island and encourage private</p>

sector participation through different policy incentives and business models;

Seek to increase urban resilience by developing master plans for rainwater drainage, improving and extending drainage infrastructure, and implementing flood management systems in vulnerable areas;

Seek to disseminate more efficient small-scale irrigation techniques and promoting soil conservation schemes for farmers and rural producers;

Seek to diversify income generating activities in rural areas by promote artisanal fishing activities (providing training, equipment, micro-credit) in coastal areas;

Seek to promote Cabo Verde's ocean-based ("blue") economy by, among others, supporting new techniques of aquaculture, improving quality of fishery products through ecolabelling, and promoting sustainable coastal and maritime tourism and sports;

Seek to strengthen governance, strategy development and capacity building by, among others:

- promoting workshops in order to introduce crop varieties and species more adaptable to climatic conditions;
- improving strategies associated with the distribution of agro-climatic zones and the structure of crops;
- improving data collection and modelling capacity associated with water and soil management;

Seek to rehabilitate or construct infrastructures for the protection of coastal zones against sea level rise and beach erosion; and

Seek to implement actions for the adaptation of fishing activities and fishing communities, building on the scenarios and strategies already developed by the Fishery Development National Institute (INDP).

International support

The Government of Cabo Verde is dependent on international support in the form of technology support, capacity-building, business development, private-sector involvement, and international climate finance.

In particular, achieving the energy-related goals communicated in this INDC will require substantial investments on grid extension and energy storage capacity, as well as technical assistance for, among others:

- preparing feasibility studies and impact assessments;
- assessing technological options;
- capacitating human resources and technicians;
- certifying equipment and systems;
- establishing monitoring protocols and performance evaluation procedures; and
- developing market-oriented policies and incentives for private sector engagement and strengthening institutional arrangements.

The cost estimates mentioned in the mitigation section above will need to be further examined, together with financing options, a roadmap for structural reforms and technical developments, and a detailed investment

agenda. To the extent mentioned above, Cabo Verde will seek the support of international climate finance through the involvement of both public and private sources.

Private and public financing needs for implementing the proposed adaptation measures still need to be assessed and determined.

Use of market-based mechanism

Several conditional measures envisaged may be financed through mechanisms and/or carbon markets, including the Clean Development Mechanism, new market and non-market based mechanisms, and credited NAMAs.

A proper GHG accounting system needs to be established to address the risk of, and ultimately avoid, double-counting of outcomes, in accordance with UNFCCC guidance and technical specifications.

II. National Context and Overall Vision

Cabo Verde is made up of ten islands and eight islets, located in the Atlantic Ocean, some 450 km west of Senegal. It has a land area of 4,033 square kilometres and a 700,000 square kilometres Economic Exclusivity Zone. The 10 islands are grouped into Windward islands (northern islands group) comprising Santo Antão, São Vicente, São Nicolau, Santa Luzia, Sal, Boa Vista, and Leeward islands (southern islands group) consisting of Maio, Santiago, Fogo and Brava. Cabo Verde has an estimated population of 524,832 inhabitants in 2015.

While the country's contribution to global warming has been negligible, as a small island country and a dry Sahelian country with only 10% arable land area, Cabo Verde is particularly vulnerable to climate change and its impacts, ranging from extreme weather conditions to sea-level rise and the degradation of fish stocks. Changes in seasonal, weather and rain patterns are already showing. Along with a depletion of the country's scarce natural resources, climate variability in Cabo Verde will increase leading to more storms, floods and droughts, and an ever-shorter rainy season. With 80% of total population live in coastal areas, Cabo Verde is particularly sensitive to sea-level rise and coastal hazards.

Despite the challenges, Cabo Verde is an emerging nation with a strong and transformative development agenda. Since achieving independence in 1975, Cabo Verde has evolved into a stable democracy and continuously growing economy, leading to substantial increases in per capita income, widespread education and health, and life-expectancy, graduating in 2007 from the list of least developed countries. Cabo Verde's human development index (HDI) grew by 11% between 2000 and 2013 and stood, in 2014, at 0,636.

Today's economy is mainly shaped by the tertiary sector (almost 70% of GDP), with the tourism industry already representing about 30% of GDP. The industry expects robust growth rates, from half a million tourists in 2013 to one million tourists per year by

2020. While a welcome boost to the economy, this development will increase the pressure on the country's fragile ecosystem and resources.

Cabo Verde is firmly committed to a global low-carbon transformation, which decouples economic growth from emissions, provides for the sustainable use of natural resources, limits average global warming to 2 degrees Celsius, with the ultimate goal of achieving 1.5 degree Celsius in the long-term, and assists nations with adapting to the consequences from sea-level rise, extreme weather events, and other effects of a changing climate.

At the domestic level, Cabo Verde has laid the relevant groundwork to achieve energy-independence on 100% renewable sources, integrate highest levels of water-efficiency and resilience to climate change, operate a fully sustainable economy and a sustainable tourism infrastructure, and work towards building what Cabo Verde has always carried in its name: a truly green island state.

III. Mitigation

Energy Sector

By 2010, the total annual energy use stood at 1,686,2 GWh. Road transport, aviation and shipping (between islands) stood for most of energy demand, followed by the residential, business and tourism sector, industries, and water production (see Figure 1).

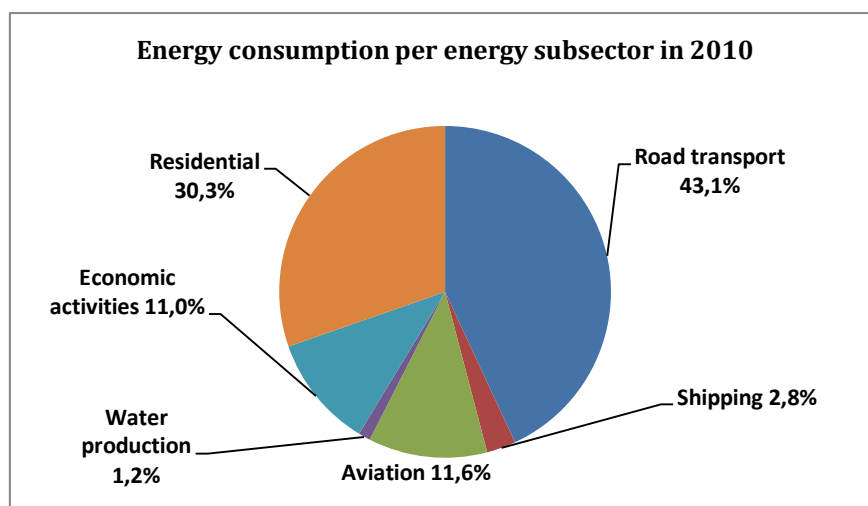


Figure 1 - Energy consumption per energy subsector in 2010

The entire sector is heavily reliant on imported fossil fuels (petroleum, diesel, gasoline, gas butane, and gasoil) and, in the year 2000, corresponded to around 92.9% of the CO₂e emissions in the country.

However, Cabo Verde is beginning to gradually increase the proportion of wind and solar energy in the energy mix, moving from 1.2% of electricity production from renewable energy in 2010 to about 25% (representing 35 MW capacity) today. Cabo Verde supports and works closely with the Sustainable Energy for All (SE4all) Initiative and – as host to the ECOWAS Regional Centre for Renewable Energy and Energy Efficiency (ECREEE) – assumes regional leadership on energy transformation in Africa.

According to Cabo Verde’s National Energy Efficiency Plan (PNAEE), today’s primary energy consumption will grow by about 2% until 2020 and then increase to 3% per year from 2020 to 2030 (“Base Scenario”). The overall energy demand in 2030 is estimated to be around 2,700 GWh (see Figure 2).

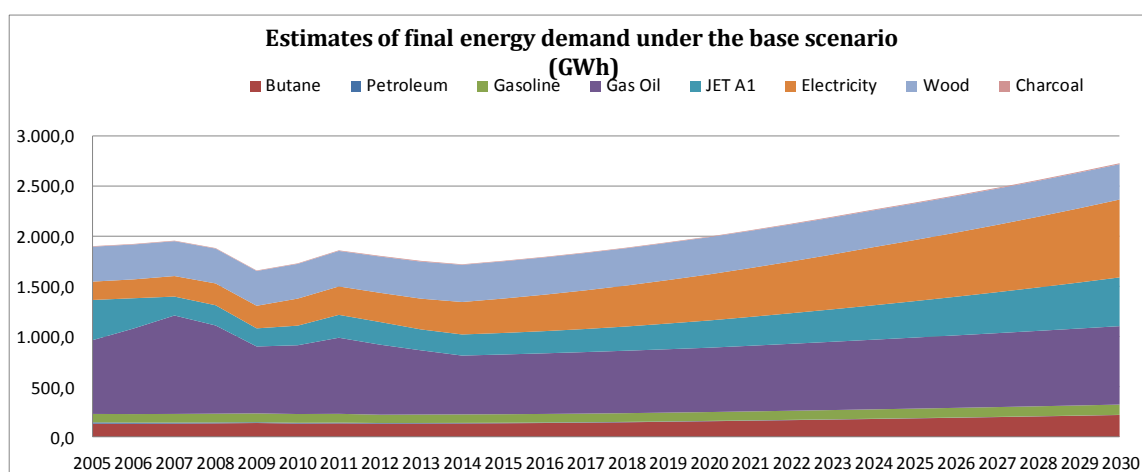


Figure 2 - Estimates of final energy demand under the Base Scenario

We attempt to depart from the Base Scenario and its GHG emissions profile by transforming the electricity sector to rely on 100% renewable sources until 2025 and by reducing overall consumption by 20% until 2030.

Proposed measures

Within the context of the domestic structural reforms planned under Cabo Verde’s Transformational Agenda, the country aims to achieve a fully decarbonized electricity system by 2030, while meeting increased demand (see Figure 3) at affordable prices.

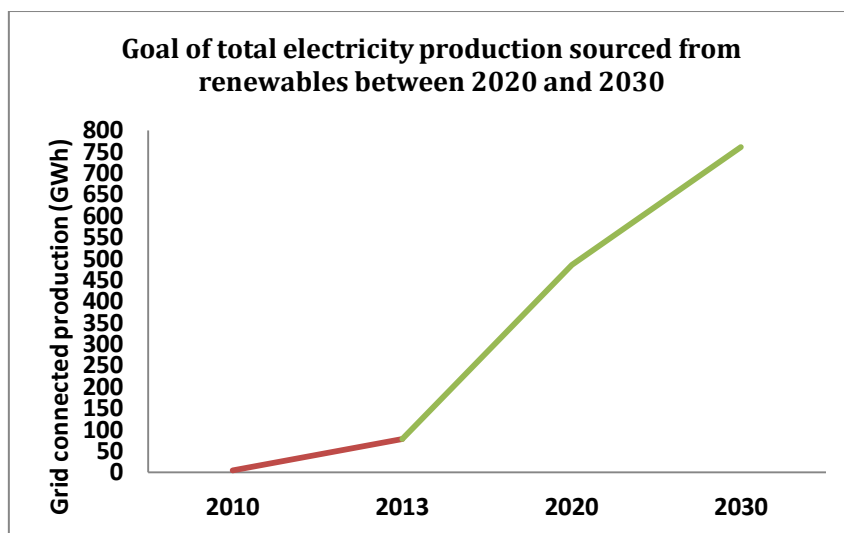


Figure 3 - Share of renewables on electricity production between 2020 and 2030

Cabo Verde’s detailed energy agenda is based on, and laid out, in the following documents, as approved at the highest Government level:

Table 2- Approved documents

Instrument	Content
National Renewable Energy Plan of 2015 (“PNAER”)	National roadmap to become 100% renewable for electricity generation
National Energy Efficiency Plan of 2015 (“PANEE”)	National comprehensive pathway to implement energy efficiency targets from now up to 2025
Agenda for Action – Sustainable Energy for All (SE4ALL Initiative)	International action agenda, approved by Cabo Verde in 2015, to secure universal energy access to all, double EE rates and to double RE proportion in the energy matrix
2015 Joint Declaration between the EU, Luxembourg, Spain, Portugal, Austria and the Republic of Cabo Verde on Reinforced Cooperation in the Field of Sustainable Energy	Bilateral policy dialogue and framework for technical assistance on energy sourcing and energy efficiency

Cabo Verde unconditionally commits to achieving a electric power penetration rate of 30% by 2025. Provided the necessary international technical and financial support is made available (in adequate, timely and predictable manner), Cabo Verde will increase the penetration rate to 100% of the installed electric power from renewables sources by 2025, with best efforts to achieve this indicative goal already by 2020. The indicative implementation trajectory is (i) 35% RE penetration rate in 2016-2018; (ii) 50% RE penetration rate in 2018-2020; and (iii) 100% RE penetration rate in 2020-2025.

Renewable sources will be based mostly on mature technologies, in particular, wind and solar, without however ignoring the potential for geothermal energy and biodiesel in specific areas.

In addition, Cabo Verde unconditionally commits to achieving long-term energy efficiency gains in the order of 10% in relation to the Base Scenario by 2030. Conditional on international technical and financial support, Cabo Verde will reduce overall energy demand by 20% in relation to the Base Scenario by 2030, with best efforts to achieve this indicative reduction effort already by 2025.

With respect to the goal to achieve the 10% reduction and 20% reduction, respectively, in overall energy demand by 2030, Cabo Verde intends to adopt a number of energy efficiency measures in several sub-sectors, including buildings, appliances, large energy consumers, fuel use and at household level.

Figure 4 below contrasts energy demand under the Base Scenario with the potential energy efficient scenario communicated in this INDC.

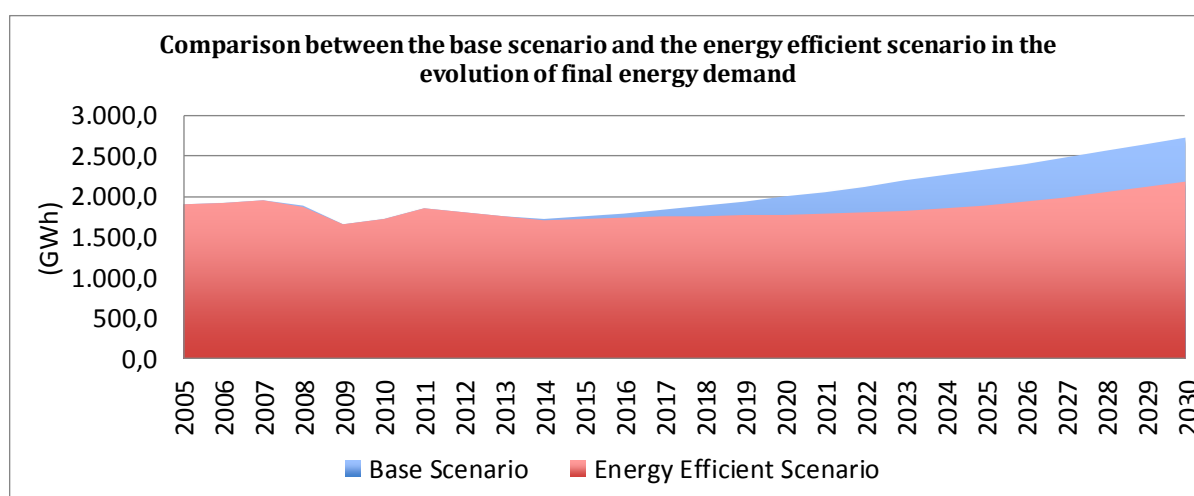


Figure 4: Energy efficiency target for 2030 (red) compared to the base scenario (blue)

The high ambition of Cabo Verde’s goals on renewable energy and energy efficiency will require a technology overhaul of the country’s energy system, paired with an enabling regulatory environment (including the consideration of specific fiscal incentives) that is able to attract sufficient private sector interest. Energy grid and storage capacity will also have to be expanded considerably and different storage technologies will be applied in light of the particularities of each island.

Table 3 below indicates the goals and actions proposed by Cabo Verde in the energy sector. Monitoring and reporting of Cabo Verde’s performance will be done via Biennial Update Reports (BURs) and, in the case of proposed NAMAs, according to the NAMA’s own MRV mechanism.

Table 3 - Cabo Verde’s proposed mitigation contributions in the energy sector

Energy sector	Proposed measures
Electricity	<p>Cabo Verde makes an unconditional commitment:</p> <ul style="list-style-type: none"> ▪ to achieve 100% grid access (up from 95%); ▪ to achieve 30% of the installed electric power from renewables sources by 2025.

With international support, Cabo Verde seeks to increase the electric power penetration rate from renewable sources to 100% of the installed electric power from renewables sources by 2025, with best efforts to achieve this goal already by 2020, in accordance with the following indicative trajectory:

- 35% RE penetration rate in 2016-2018;
- 50% RE penetration rate in 2018-2020;
- 100% RE penetration rate in 2020-2025.

To achieve this goal, the following key measures are envisaged:

- smart-grid enhancement for the country's 9 independent networks with state-of-the-art power conditioning, production and distribution control;
- built-up of energy storage facilities (including through batteries and flywheels);
- design of renewable micro-grids;
- design of individual energy systems (solar home systems); and
- systematic deployment of solar-water-heaters across all islands.

The ambitious renewable energy roadmap will require close planning in public-private partnerships, simplified procedures for licensing and certification ("one-stop-shops"), the creation of robust competitive market conditions, and the consideration of specific fiscal incentives to attract the private sector.

Energy Efficiency

Seek to reduce overall energy demand by 20% in relation to the Base Scenario by 2030, with best efforts to achieve this indicative reduction effort already by 2025.

To achieve this goal, the following key measures are envisaged:

- seeking to reduce the proportion of technical and non-technical losses in energy distribution from about 25% in 2010 to less than 8% by 2030 or before;
- improving energy efficiency of large consumers, with particular focus on hotels, hospitals and public administration offices by 2030 or before, including through mandatory installation of solar-water-heater components;
- improving by at least 10% fuel-usage across sectors and modes of application (except butane usage) by 2030 or before;
- achieving 30% of efficiency improvement in the use of electric power (15% residential, 15% commercial);
- improving energy performance of the building envelop, seeking to cover all new (public or private) buildings by 2030 or before;
- enhancing energy efficiency of street lighting and creating energy rating labels for domestic appliances and air conditioning by 2030 or before;
- further promoting the use of smaller distributed energy solutions (e.g. solar pumps) for water pumping, distribution and irrigation; and
- promoting the built-up of a comprehensive network of energy services companies (ESCOs) and clean-energy business incubators.

Transport-specific NAMA

Seek to develop a NAMA that increases energy efficiency of the transport sector, including domestic shipping and domestic air travel, and evaluates options for policies and actions available to reduce the impact of GHG emissions originating from this sector.

The NAMA will initially be focused on the collection of relevant data

for the sector, including, among others, fuel type and consumption per transport mode, technology performance, fuel substitution possibilities, estimation of costs, and an updated GHG emissions profile for light-duty vehicles as well as for freight and passenger transportation services.

This NAMA will also consider options for boosting hybrid and electric fleet in the country, in particular, the feasibility of making government vehicles electrically powered by 2030.

Base Scenario

The Base Scenario for the overall energy demand until 2030 considered the historical evolution and relevant variables associated with energy use, population and economic growth. It projects a moderate annual growth rate in energy demand of around 2% until 2020, increasing to 3% per year from 2020 to 2030.

The overall energy demand in 2030 under the Base Scenario is estimated to be around 2,700GWh.

Forest Sector

One of Cabo Verde's highest economic, environmental and climate change related priorities concerns the country's forests. Forest vegetation and forest soils prove the most effective means to store and retain water, minerals and nutrients. They avoid erosion, soil degradation and desertification, thus securing agricultural land. They provide biomass sources; and increase resilience against long, increasingly often, periods of drought. Water availability is approximately 500 m³ a year per person, the second lowest of any country in sub-Saharan Africa.

After centuries of degradation, Cabo Verde has successfully engaged in reforestation and afforestation campaigns since the 1920s. Today's forested area spans some 84,000 hectares, roughly a fifth of the national land territory, the vast majority of it planted (with about 400 trees per hectare). Despite considerable planting activities, management tools such as inventories and management plans remain at an infancy state.

Degradation, too, continues. About 35% of households – virtually all of them located in rural areas – depend on firewood for cooking food. Most of the wood biomass – according to estimates some 100 tonnes a year – originate from forested lands and is harvested with scarce regard to sustainable harvesting methods. Pressure from a growing population, unplanned urbanization, and non-sustainable grazing contribute to overall degradation. Together with a notable increase in drought years since the 1960s, this represents the most single threat to sustainable development in Cabo Verde.

The leading policy framework for Cabo Verde's forestry sector includes the Economic Transformation Strategy (TEE), which proposes, among others, the sustainable management of resources and the development of agroforestry and the participatory management of forest areas, as well as the Strategy Document on Growth and Poverty Reduction (*Documento de Estratégia de Crescimento e Redução da Pobreza - "DECRP")* III – covering the years 2011-2016 – which argues for a "better management of natural resources, including lands, water, fishing and floral resources" and for "economic, social

and physical resilience towards natural disasters and climate change related incidents to alleviate the associated risks” and the National Forestry Action Plan (NFAP).

Proposed measures

Table 4 below shows the goals and actions proposed by Cabo Verde in the forestry sector. Monitoring and reporting of Cabo Verde’s performance will be done via Biennial Update Reports (BURs) and, where appropriate, make use of CDM (and other widely applied) baseline and monitoring methodologies.

Table 4 - Cabo Verde’s proposed mitigation contributions in the forestry sector

Forestry sector	Proposed measures
Afforestation and reforestation	<p>Cabo Verde makes an unconditional long-term commitment to engage in new afforestation/reforestation (“A/R”) campaigns in the order of 10,000 hectares until 2030 by 2030;</p> <p>With international support, Cabo Verde seeks an A/R campaign area of around 20,000 hectares until 2030;</p> <p>Cabo Verde estimates a planting effort of 400 trees per hectare. If 20,000 hectares are successfully planted, this will generate a long-term sequestration gain of 360 tCO₂eq per hectare sequestered after 30 years, corresponding to 7.2 mtCO₂eq for 20,000 hectares after 30 years.</p> <p>Cabo Verde also aims at eliminating three stone cooking stove (35% of households still use three-stone stove) through improved low-emissions cookstoves by 2025 at the latest, and thereby substantially removing demand for firewood.</p>
Governance, strategies and capacity building	<p>Seek to:</p> <ul style="list-style-type: none"> ▪ Improve and update of land inventory and registry (including demarcation services, as appropriate) by implementing: <ul style="list-style-type: none"> - a fully developed and operational inventory and land registry - an area scoping and feasibility analysis; ▪ Designate priority afforestation/reforestation areas based on vegetation options, technical considerations (including concerning water-retention needs, fire prevention and restoration viability), clear tenure rules, and management agreements with private land holders; ▪ Prepare a sustainable land management plan coupled with performance-based subsidies.

Waste Management Sector

There are few comprehensive surveys on waste, waste management, and emissions from waste. Main sources of wastewater and solid waste emissions are household waste, tourism induced, and agricultural waste. According to the Second National Communication, emissions from the waste sector accounted for 32.4% of total CH₄ emissions in 2000, and solid waste disposal corresponded to 97.0% of that portion.

Cabo Verde solid waste management has traditionally been organized around its 22 municipalities with most of the solid waste – around 113,000 tonnes per year in 2010 – still going directly into open dumps, with the exception of the city of Praia which

currently operates a sanitary landfill. In addition, while there is potential for capturing energy in wastewater treatment plants, the use of sludge for thermal power generation purposes remains at concept stage.

Cabo Verde initiated an ambitious governance reform process to overcome the deficiencies in the sanitation sector. The 2010 the National Basic Sanitation Plan is currently being updated through the Waste Roadmap for Cabo Verde (*Roadmap de Resíduos de Cabo Verde*). It also launched the National Strategic Water and Sanitation Plan (*Plano Estratégico Nacional de Água e Saneamento* - “PLENAS”) and is currently preparing detailed water and sanitation master plans (*Planos Diretores de Água e Saneamento - PDAS*) for each of the islands. The reformed Water and Sanitation Code (*Código de Água e Saneamento*) and the General Solid Waste Law are expected to be soon enacted.

Proposed measures

Table 5 below shows the goals and actions proposed by Cabo Verde in the waste sector. Monitoring and reporting of Cabo Verde’s performance will be done via Biennial Update Reports (BURs) and, where appropriate, make use of CDM (and other widely applied) baseline and monitoring methodologies.

Table 5 - Cabo Verde’s proposed mitigation contributions in the waste sector

Waste sector	Proposed measures
Solid waste	<p>Seek to provide proper waste management coverage (with waste segregation, recycling, and treatment in sanitary landfills) for 50% of the most vulnerable municipalities by 2030, including:</p> <ul style="list-style-type: none"> ▪ implementing educational programs for the separation of basic waste types by households and waste producers; ▪ planning and building 5 waste collection and recycling facilities and/or general drop off points by 2025; ▪ planning and building at least 1 landfill equipped with gas-to-energy systems by 2025; and ▪ developing stand-alone bio-energy solutions; <p>Seek to further develop and implement the Waste Roadmap for Cabo Verde, as well regulate and implement the new General Solid Waste Law.</p>
Wastewater	<p>Seek to promote the use of the resulting sludge from the wastewater treatment process for the production of clean energy, which includes carrying-out technological an options assessment and developing business models and investment plans;</p> <p>Seek to develop and implement the water and sanitation master plans (“Planos Diretores de Água e Saneamento - PDAS”), as well as regulate and implement the new Water and Sanitation Code.</p>
Governance, strategies and capacity building	<p>Seek to:</p> <ul style="list-style-type: none"> ▪ collect and organize relevant data on waste generation; ▪ design an inter-municipal integrated waste management system; ▪ increase institutional and technical capacity of the public sector to engage with private sector operators and technology providers.

IV. Adaptation

Due to its small insular and volcanic characteristics, Cabo Verde suffers from severe natural resources constraints. The lack of arable lands (only about 10% of the land is potentially arable) forces the country to import between 80% and 90% of its food needs. In addition, the country's coastal lines are particularly vulnerable to sea level rise and erosion. Around 80% of its population is currently living in these coastal areas. Cabo Verde's coastal zones are also crucial to foster and sustain the local tourism industry, the main driving force behind the country's service-oriented economy.

Climatic models ran during the NAPA assessment for the period 2008-2012 have shown that the country's natural vulnerabilities, along with their social and economic implications, are very likely to be exacerbated by climate-related disruptions in the next decades. These include more frequent extreme events like storms, floods and droughts, as well as shorter rainy seasons, with immediate impacts on livelihoods, infrastructure, sanitary conditions, recharge of reservoirs, and crop productivity.

Cabo Verde is affected by acute water scarcity (both surface and underground). Mean annual precipitation levels are erratic and have decreased considerably since 1970. Rainfall projections to 2020 reveal values below the historical pattern. As result, the country has implemented and regularly maintains around 20 highly costly and energy-intensive water desalination units. Daily water needs of population centres, tourism and agriculture is predicted to increase fourfold, from around 50,000m³ to 160,000m³ by 2030 and thus the potential of various sustainable water supply and mobilization solutions will need to be better explored going forward.

Despite the existence of wastewater treatment facilities in the main urban areas, wastewater remains scarcely managed across the islands of Cabo Verde. Cabo Verde plans an ambitious operational overhaul of its sanitation management system to overcome infrastructure challenges, in particular, extending the water supply network, improving sewage collection and disposal, and properly harvesting and storing rainwater/storm water runoffs.

Adapting its fragile ecosystems to climate change is a key priority for Cabo Verde. Table 6 below summarizes existing policies and actions to increase the country's adaptive capacity.

Table 6 - Cabo Verde's existing adaptation policies and actions

Existing policies and actions	Description
National Strategic Water and Sanitation Plan (<i>Plano Estratégico Nacional de Água e Saneamento</i> - "PLENAS")	Through Resolution 10/2015, of February 20 th , Cabo Verde passed the PLENAS, kick-starting a water and sanitation reform in the country. The Plan provides strategic guidance to the different government levels and a detailed planning process to be carried out in the islands. A key strategic objective the PLENAS is to ensure that every citizen has minimum daily water consumption level of 40l and a maximum of 90l. The

	expansion in water supply is to be aligned with measures to improve overall sanitation system, optimize the use of the resources, reduce water distribution losses, and promote rainwater harvesting and water re-use.
Project “Building adaptive capacity and resilience to climate change in the water sector”	With assistance from UNDP and GEF, this project aims to create a more systematic response to climate disruptions by developing adaptation policies and measures to better manage climatic vulnerability and by implementing targeted demonstration investments.
Water supply project in Santiago	With support from Japan International Cooperation Agency (JICA), Cabo Verde is currently implementing a project that aims to meet water demand of several communities in the island of Santiago. The project includes the construction of wells and promoting efficiency in water use and allocation.
Water, Sanitation and Hygiene (WASH) Project	Within the Millennium Challenge Account framework, the WASH project seeks to improve water supply and sanitation services to companies and families in Cabo Verde.
National Basic Sanitation Plan (<i>Plano Nacional de Saneamento Básico</i>)	Approved through Resolution 52/100, the Plan seeks to set a new path for sanitation in the country, with particular focus on improving institutional framework and basic sanitation infrastructure.
National Adaptation Programme of Action (<i>Programa de Acção Nacional de Adaptação as Mudanças Climáticas – “NAPA”</i>)	Cabo Verde elaborated its NAPA covering the period 2008-2012. The NAPA focuses on three strategic areas for action: (i) water resources; (ii) agriculture practices and forestry; (iii) coastal zones and tourism.
Growth and Poverty Reduction Strategy (<i>Documento de Estratégia de Crescimento e Redução da Pobreza – “DECRP”</i>):	Since 2004 Cabo Verde elaborates and reassesses periodically its DECRP containing, among other development strategies, actions to promote food security and protect the environment. The DECRP I considered the planning cycle for the period 2008-2013. DECRP II covers the period 2011-2014. Cabo Verde is currently implementing the DECRP III.
National Environmental Action Plan (“ <i>Plano de Acção Nacional para o Ambiente – “PANA”</i> ”)	The PANA seeks to mainstream environmental considerations in all the country’s relevant planning process. In 2004 Cabo Verde launched the PANA II, covering the period from 2004 to 2014. PANA II offers strategic guidance to address key environmental and social issues of Cabo Verde: water scarcity, loss of marine biodiversity, and poor sanitation infrastructure.
Strategic Plan for Agriculture Development (<i>Plano Estratégico do Desenvolvimento Agrícola – “PEDA”</i>) and the specific Action Plans for Agriculture Development (<i>Planos de Acção para o Desenvolvimento da Agricultura – “PADA”</i>)	Following the guidelines established in the PEDA, Cabo Verde launched the PADAs for the islands of Santiago, Fogo, Santo Antão and São Nicolau and set out detailed sectoral guidance for local authorities on, among others, adaptation-related actions for agriculture and fishing activities.
National Program for Food Security (<i>Programa Nacional para Segurança Alimentar</i>)	Strategy document that provides for adaptation-related actions in the agriculture and fishery sectors.

Proposed measures

Based on the analysis already carried-out during the NAPA process, Cabo Verde now seeks international support to further develop the necessary strategies and national policies to establish an integrated framework that increases the country's overall adaptive capacity, as well as the level of resilience of those most vulnerable to climatic variability and climate change.

Building on the priorities identified during the development of the NAPA process, Cabo Verde proposes to focus its adaptation actions on the following strategic axes:

- Promoting integrated water resources management, guaranteeing stable and adequate water supply (for consumption, agriculture, ecosystems and tourism);
- Increasing adaptive capacities of the agro-silvo-pastoral production systems in order to ensure and improve national food production, and promoting Cabo Verde's blue economy; and
- Protecting and preventing degradation of the coastal zones and their habitat.

In addition, Cabo Verde will further expand on measures and actions already initiated with international support to other areas of the country, such as increasing groundwater reserves and land conservation practices, implementing measures to mitigate floods and intercept runoff, and expanding more-efficient irrigation practices (e.g., drip irrigation, drainage and irrigation monitoring, and crop adaptation techniques).

Table 7 below identifies the key adaptation actions to be implemented by Cabo Verde with a view to achieve the above stated priorities. Financing needs and flows for implementing the proposed adaptation activities still need to be assessed and determined.

Table 7 - Cabo Verde's proposed adaptation goals and measures

Adaptation sector	Proposed measures
Water and sanitation management	<p>Seek to ensure by 2030:</p> <ul style="list-style-type: none">▪ that every citizen has safe access to a minimum of 40l potable water per day;▪ that all urban households are connected to the water supply network;▪ that public sewage collection system and proper disposal is extended to cover 90% for the cities of Praia and Mindelo and 50% of rural areas;▪ the construction (or retrofitting/expansion) of at least 4 wastewater treatment plants and water re-use facilities; <p>Seek to establish a systematized electronic database for storage and management of relevant water-related information, including a MRV to assess water-relevant data and to better evaluate performance in the sector;</p> <p>Seek to build several new desalination and water pumping units. With progressive increase of RE penetration in the grid, overall energy costs are expected to reduce, decreasing also potable water supply and irrigation costs. Decentralized renewable energy solutions and more</p>

	<p>efficient technologies will also be considered and tested by Cabo Verde;</p> <p>Seek to promote new water storage and distribution techniques and build at least 5 new dams by 2030;</p> <p>Seek to develop water and sanitation master plans (“planos diretores”) for each island and encourage private sector participation through different policy incentives and business models, such as concessions, privatization, leasing, among others, and equitable tariff policies;</p> <p>Seek to increase urban resilience by developing master plans for rainwater drainage, improving and extending drainage infrastructure, and implementing flood management systems in vulnerable areas.</p>
Adaptive capacity of agro-silvo- pastoral production and promotion of blue economy	<p>Seek to disseminate more efficient small-scale irrigation techniques and promote soil conservation schemes for farmers and rural producers;</p> <p>Seek to diversify income generating activities in rural areas by promoting artisanal fishing activities (providing training, equipment, micro-credit) in coastal areas;</p> <p>Seek to promote Cabo Verde’s ocean-based (“blue”) economy by, among others, supporting new techniques of aquaculture, improving quality of fishery products through ecolabelling, and promoting sustainable coastal and maritime tourism and sports;</p> <p>Seek to strengthen governance, strategy development and capacity building by, among others:</p> <ul style="list-style-type: none"> ▪ promoting workshops in order to introduce crop varieties and species more adaptable to climatic conditions; ▪ improving strategies associated with the distribution of agro-climatic zones and the structure of crops; and ▪ improving data collection and modelling capacity associated with water and soil management.
Protecting and preventing degradation of coastal zones and their habitat	<p>Seek to rehabilitate or construct infrastructures for the protection of coastal zones against sea level rise and beach erosion;</p> <p>Seek to implement actions for the adaptation of fishing activities and fishing communities, building on the scenarios and strategies already developed by the Fishery Development National Institute (INDP).</p>



KINGDOM OF CAMBODIA
Nation, Religion, King

Cambodia's Intended Nationally Determined Contribution

Introduction

Cambodia recognises the need for respecting the principles of the United Nations Framework Convention on Climate Change (UNFCCC), in particular the principle of 'common but differentiated responsibilities and respective capabilities' along with the right to the sustainable development of developing countries. A global limit of greenhouse gas emissions is also needed in order to achieve the ultimate objective of convention, which is “*to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system*”. In response to the ‘Lima Call for Action’¹, Cambodia is pleased to present its Intended Nationally Determined Contribution (INDC) to the UNFCCC, ahead of COP 21 in Paris, December 2015. This INDC is subject to revisions to meet national circumstances as the country continues along its development pathway.

Cambodia is a low emitter and highly vulnerable country to the negative effects of climate change. Our contribution is therefore necessarily aligned with our development priorities. The INDC includes both adaptation and mitigation actions based on national circumstances. Cambodia's INDC is composed of five sections:

- Section 1: National context, presenting national circumstances relevant to the INDC
- Section 2: Adaptation, covering Cambodia's vulnerability to climate change and prioritised adaptation actions
- Section 3: Mitigation, including Cambodia's intended contribution to reduce greenhouse gas emissions, with information to ensure clarity, transparency and understanding, and consideration of fairness and ambition
- Section 4: Planning and implementation processes, with indications of the institutions, policies, strategies, and plans that will support the implementation of the INDC
- Section 5: Means of implementation, with information on the support needed for the implementation of the INDC.

¹ UNFCCC decision Decision -/CP.20
https://unfccc.int/files/meetings/lima_dec_2014/application/pdf/auv_cop20_lima_call_for_climate_action.pdf

Cambodia is confident that through INDCs, which is a new, ‘bottom-up’ approach to addressing climate change, the *impasse* in the negotiations that have been experienced in the past years will be overcome. Cambodia also hopes that the new agreement to be finalised at COP 21 will be successful in limiting temperatures to a level that would prevent dangerous anthropogenic interference with the global climate system, and at the same time contribute to global poverty reduction and promote economic growth efforts.

1. National Context

Cambodia is highly vulnerable to the effects of climate change, in particular from floods, droughts, windstorms, and seawater intrusion. Agriculture, infrastructure, forestry, human health, and coastal zones are the most affected sectors. Cambodia’s main national development priority, enshrined in the National Strategic Development Plan (NSDP) for 2014-2018, is to reduce poverty while fostering economic growth at a steady rate of 7-8% per year². Cambodia aims to progress from least-developed country (LDC) status towards a low and high middle-income developing country by 2018 and 2030 respectively. It is intended that this goal will be achieved by diversifying the economy, including through industrialisation and the development of physical infrastructure.

Efforts in addressing climate change in Cambodia cannot be separated from economic development and poverty alleviation goals. The agriculture sector is expected to grow at an annual rate of 5% in order to meet national economic growth and export targets, as well as to contribute to the population’s food security needs. At the same time, Cambodia has more than 57% forest cover, which the government endeavours to increase and maintain, to ensure livelihoods for forest-dependent communities and future generations. The pressure on resources and land is high, and whilst the latest available GHG inventory suggests that Cambodia was an overall net carbon sink in 2000³.

Despite the many challenges inherent in realising such strong ambitions, Cambodia is proud of the progress made in climate change policy, in particular since the accession to the UNFCCC in 1996. Explicit efforts have been made in mainstreaming climate change into national and sub-national planning. For example, Cambodia has developed and implemented the Climate Change Strategic Plan 2014 – 2023 (CCCSP), and associated action plans developed by each relevant ministry. These plans are Cambodia’s first ever comprehensive national policy documents that illustrate not only the country’s priority adaptation needs, but also provide roadmaps for the de-carbonisation of key economic sectors and the enhancement of carbon sinks. Further, Cambodia has developed a Green Growth Policy and Roadmap

² Source: RGC (2014), National Strategic Development Plan 2014-18, Ministry of Planning. Available at: <http://www.mop.gov.kh/Home/NSDP/NSDP20142018/tabid/216/Default.aspx>

³ According to the latest greenhouse gas inventory for 2000 in: RGC (2015), Second National Communication to the UNFCCC, Ministry of Environment (unpublished)

which sets the path to stimulating the economy through low carbon options, savings and creating jobs, protecting vulnerable groups, and improving environmental sustainability.

Cambodia has also made progress in integrating climate change in budgeting through the development of a climate change financing framework, in addition to producing regular climate public expenditure reviews and having improved tracking of climate finance in the Official Development Assistance (ODA) database. There is ongoing work in priority sectors to strengthen climate change-related budget submissions and in integrating climate change in their monitoring and evaluation systems. Climate finance modules are also being integrated in the public financial management training courses provided for government officials.

2. Adaptation

2.1. Vulnerability to Climate Change

Cambodia is one of the most climate vulnerable countries in the world⁴. As a least developed, agrarian country, Cambodia's vulnerability to climate change is mainly due to its geography, high reliance on the agriculture sector, and low adaptive capacity, including limited financial, technical and human resources. Over the past decade, Cambodia has witnessed more frequent and severe floods, droughts and windstorms which pose serious challenges to socio-economic development. As well as occurring more frequently, storms have resulted in increasingly high physical and economic impacts, in particular in rural areas. As an example, heavy rainfall in October 2013 resulted in flash floods, impacting over half a million people. More than half of Cambodia's provinces were impacted, with the Mekong region being particularly affected, as the river's water levels rose with the rainfall. An assessment indicated that the damage and loss caused by the 2013 floods was 356 million US\$⁵, of which 153 million US\$ was the estimated value of the destruction of physical assets (damage) in the affected areas, and 203 million US\$ the estimated losses in production and economic flows. Similarly, in 2012, drought was experienced by 11 out of the 24 provinces in Cambodia and negatively affected tens of thousands of hectares of rice growing areas.

Meteorological modelling predicts that temperatures will rise in the future and, in addition to the increased frequency of severe floods experienced over the last decade, rainfall patterns will become more unpredictable by 2050. Agriculture, infrastructure, forestry, human health, and coastal zones are the most vulnerable sectors to the impacts of climate change:

- **Agriculture:** The country's most agricultural production system is dependent either on rainfall or on the annual flooding and recession of the Tonle Sap Great Lake. The sector is therefore particularly sensitive to potential changes in local climate and monsoon regimes

⁴Source: Royal Government of Cambodia (RGC, 2012), RGC (2006) and RGC (2015), Second National Communication to the UNFCCC, Ministry of Environment (unpublished)

⁵Cambodia 2013: Post-Flood Early Recovery Need Assessment Report, RGC.

- **Infrastructure:** the increasing occurrence and severity of floods exacerbated by climate change are resulting in high costs for the maintenance and upgrading of roads and irrigation infrastructure. This is particularly the case in urban areas where more and more assets and population are concentrated
- **Forestry:** Under emission scenarios SRESB1 and SRESA2 up to 2050 most lowland forest will be exposed to a longer dry period, particularly forest areas located in the northeast and southwest. More than 4 million hectares of lowland forest, which currently has a water deficit period of between 4 and 6 months, will become exposed to a greater water deficit period of between 6 to 8 months or more
- **Human health:** Climate change can have both direct and indirect impacts. Examples of direct impacts include death, injury, psychological disorders and damage to public health infrastructure. Examples of indirect impacts include changes in the geographical range and incidence of vector-borne diseases, water-borne and infectious diseases, malnutrition and hunger as a result of ecosystem disturbance
- **Coastal zones:** Coastal zone resources already face a number of pressures, including from over-fishing, over-exploitation of forest resources and mangrove ecosystems leading to increased erosion. Climate change adds to these existing challenges through sea level rise, shrinking arable land and decreasing availability of drinking water.

2.2 Priority Actions

Adapting to current and future effects of climate change is a priority for Cambodia. Cambodia firmly believes that climate change adaptation action requires an integrated, multi-sector approach to be effective and to be able to support national development objectives. Cambodia has therefore selected a number of priority actions, giving prominence to ones with climate change impact mitigation co-benefits, as follows:

- Promoting and improving the adaptive capacity of communities, especially through community based adaptation actions, and restoring the natural ecology system to respond to climate change
- Implementing management measures for protected areas to adapt to climate change
- Strengthening early warning systems and climate information dissemination
- Developing and rehabilitating the flood protection dykes for agricultural and urban development
- Increasing the use of mobile pumping stations and permanent stations in responding to mini-droughts, and promoting groundwater research in response to drought and climate risk
- Developing climate-proof agriculture systems for adapting to changes in water variability to enhance crop yields.
- Promoting climate resilient agriculture in coastal areas through building sea dykes and scaling-up of climate-smart farming systems

- Developing crop varieties suitable to Agro-Ecological Zones (AEZ) and resilient to climate change
- Promoting aquaculture production systems and practices that are adaptive to climate change
- Repairing and rehabilitating existing road infrastructure and ensuring effective operation and maintenance, taking into account climate change impacts
- Up-scaling the Malaria Control Program towards pre-elimination status of malaria
- Up-scaling of national programmes to address the risk of acute respiratory infection, diarrhoeal disease and cholera in disaster-prone areas. Including conducting surveillance and research on water-borne and food-borne diseases associated with climate change
- Strengthening technical and institutional capacity to conduct climate change impact assessments, climate change projections, and mainstreaming of climate change into sector and sub-sector development plans.

The implementation of each of the above actions and the context in current climate change strategies are presented in Table 1 in the Annex.

2. Mitigation

3.1 Contribution

Cambodia's contribution particularly aligns with the following requirement of the Lima Call for Action, paragraph 11:

- *“...the least developed countries and small island developing States may communicate information on strategies, plans and actions for low greenhouse gas emission development reflecting their special circumstances in the context of intended nationally determined contributions...”*

Cambodia wishes to propose a GHG mitigation contribution for the period 2020 – 2030, conditional upon the availability of support from the international community, in particular in accordance with Article 4.3 of the UNFCCC. Significantly, despite Cambodia's status as an LDC, Cambodia is implementing actions in accordance with our sustainable development needs that also address climate change:

- (i) **Energy industries, manufacturing industries, transport, and other sectors:** Cambodia intends to undertake actions as listed in Table 1, the impact of which is expected to be a maximum reduction of **3,100 Gg CO₂eq** compared to baseline emissions of **11,600 Gg CO₂eq** by 2030.
- (ii) **LULUCF:** Cambodia intends to undertake voluntary and conditional actions to achieve the target of increasing forest cover to 60% of national land area by 2030. In absence of any actions the net sequestration from LULUCF is expected to

reduce to **7,897 GgCO₂** in 2030 compared to projected sequestration of **18,492 GgCO₂** in 2010⁶.

Tables 1 and 2 detail the potential mitigation reduction in these sectors, along with the necessary corresponding actions to realise the mitigation potential identified.

Table 1: Mitigation actions in key sectors – aggregate reductions by 2030

<i>Sector</i>	<i>Priority actions</i>	<i>Reduction as Gg CO₂eq and % in the year 2030 compared to the baseline</i>
Energy Industries	National grid connected renewable energy generation (solar energy, hydropower, biomass and biogas) and connecting decentralised renewable generation to the grid. Off-grid electricity such as solar home systems, hydro (pico, mini and micro). Promoting energy efficiency by end users.	1,800 (16%)
Manufacturing Industries	Promoting use of renewable energy and adopting energy efficiency for garment factory, rice mills, and brick kilns.	727 (7%)
Transport	Promoting mass public transport. Improving operation and maintenance of vehicles through motor vehicle inspection and eco-driving, and the increased use of hybrid cars, electric vehicles and bicycles.	390 (3%)
Other	Promoting energy efficiency for buildings and more efficient cookstoves. Reducing emissions from waste through use of biodigesters and water filters. Use of renewable energy for irrigation and solar lamps.	155 (1%)
Total Savings		3,100 (27%)

⁶This information is based on an assessment undertaken for preparing the Second National Communication (SNC).

Table 2: Contribution from the LULUCF sector

<i>Name of activity</i>	<i>Description</i>	<i>Estimated emission reductions</i>
Increasing the forest cover to 60% of national land area by 2030, and maintaining it after 2030	<p>In accordance with the National Forest Programme (2010-2029), Cambodia is striving to increase and maintain the forest cover at 60% of the total land area, from an estimate of 57% in 2010. This will be achieved in particular through:</p> <p><u>Reclassification of forest areas to avoid deforestation:</u></p> <ul style="list-style-type: none"> - Protected areas: 2.8 million hectares - Protected forest: 3 million hectares - Community forest: 2 million hectares - Forest concessions reclassified to protected and production forest: 0.3 million hectares - Production forest: 2.5 million hectares. <p><u>Implementation of the FLEGT ⁷ programme in Cambodia</u></p> <p>The objective is to improve forest governance and promote international trade in verified legal timber.</p>	4.7 tCO ₂ eq/ha/year

3.2 Information to Facilitate Clarity, Transparency and Understanding

Table 3 provides additional information to assist the UNFCCC in compiling and comparing the contributions from all INDCs received by Parties to the convention.

Table 3: Summary of information to facilitate clarity, transparency, and understanding

Information for the UNFCCC		
Time frames and/or periods for implementation		
Timeframe	for	2020 to 2030

⁷ FLEGT stands for Forest Law Enforcement, Governance and Trade. It aims to reduce illegal logging by strengthening sustainable and legal forest management, improving governance and promoting trade in legally produced timber.

Information for the UNFCCC	
implementation	
Scope and coverage	
Scope of gases included in the contribution	Carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O)
Geographies covered by the contribution	All national territories
Assumptions and methodological approaches	
Methodology for estimating emissions and projections	<p>Historical GHG inventory: The reported estimates of emissions of GHGs and removals of CO₂ are based on data reported in the draft Second National Communication (SNC) developed by the Government of Cambodia. The GHG inventory used Tier 1 methodologies set out in the IPCC 1996 Guidelines, IPCC default emission factors and country specific activity data from 2000.</p> <p>Baseline GHG projections: In the energy sector, projections have been generated for the SNC using Long-range Energy Alternatives Planning (LEAP) modelling, using default emission factors and activity data from a wide range of sources. Projections for the land use, land use change and forestry (LULUCF) sector take into account forest and grassland conversions and land abandonment, and are based on methodologies in the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance. All projections took into account current macroeconomic conditions, policy conditions, market conditions and events in other sectors.</p> <p>Mitigation options: These were formulated based on previous needs analyses, experience from successful projects, pilot projects, feasibility studies, literature reviews and expert opinion.</p>
Approaches for land use, land-use change and forestry emissions	Though actions for LULUCF are presented as a conditional contribution, a precise list of actions and the GHG impacts will be updated after finalisation of the REDD+ Strategy (Reducing Emissions from Deforestation and Forest Degradation “Plus” Strategy).
Global Warming Potentials (GWP)	GWPs values used for estimating CO ₂ e are taken from the IPCC Second Assessment Report
Reference point	

Information for the UNFCCC	
Business as Usual (BAU) emissions in the target year	11,600 Gg CO ₂ eq by 2030
Projection methodology for low carbon scenarios	A LEAP model was used to project the BAU scenario for energy sector, while COMAP was used for LULUCF, as indicated in the draft SNC.

3.3 Fairness and Ambition

Cambodia recognises the need for all countries to present fair and ambitious INDCs, and acknowledges the objectives laid out in the Lima Call for Action.

As an LDC, Cambodia emits a small share of present global emissions and accounts for a fraction of past global emissions. Taking into account the important role of forestry in carbon capture, Cambodia was still a net sink in the year 2000. As per estimates in draft SNC, Cambodia's BAU per capita emissions in 2050 will be 2.59 tCO₂eq, this is less than half of current world per capita emission. The actions proposed, if adequately supported through finance, technology transfer, and capacity building, will keep the per capita emissions to an estimated 2.04 tCO₂eq by 2030 which is below world average for a 2°C pathway.

Cambodia, despite being an LDC, has for the first time presented a clear list of mitigation actions to limit growth in GHG emissions, making a significant deviation from BAU, and thus going beyond existing actions.

Cambodia seeks to maximise synergies between mitigation and adaptation, and sustainable development. Hence, the actions proposed are necessarily integrated with Cambodia's development priorities, whilst ensuring that growth shifts towards a low carbon development pathway, and align with efforts to increase our country's resilience.

4. Planning and Implementation Processes

The INDC has been developed under the coordination of the National Council for Sustainable Development. An INDC Preparation Team has been appointed, with representatives from relevant ministries that will be responsible for the implementation of the specific actions identified.

This INDC (and its future revisions) are to be an integral part of the climate change architecture of Cambodia. Hence its implementation will be aligned with that of Cambodia's national climate change policy, and not create unnecessary duplication.

There are a number of existing and planned domestic processes for delivering, supporting, and monitoring climate change policy in Cambodia, thereby facilitating the successful implementation of the actions captured in the INDC. It is clear that these strategies and plans will need to be revised once the timeframes expire, after having assessed the progress achieved under them.

Cambodia made extensive progress in developing processes for implementing climate change interventions over the last decade. The overarching development plan for the country, the National Strategic Development Plan (2014-2018), states the importance of implementing Cambodia's Climate Change Strategic Plan (2014-2023) and contains indicators to track implementation of climate change actions. Further, the INDC development is guided by the Green Growth Road Map (2009), developed with the aim to support the achievement of middle-income country status by 2030. The roadmap also has priority projects for the longer term i.e. 2020-2030.

Cambodia intends to support the initial delivery of the INDC mainly through the implementation of the Cambodia Climate Change Strategic Plan (CCCSP) (2014 – 2023). The following strategic priorities aim to develop Cambodia towards a green, low-carbon, climate-resilient, equitable, sustainable and knowledge-based society:

(1) The line ministries have developed Sectoral Climate Change Strategic Plans and Action Plans (SCCSPs and SCCAPs) are aligned with CCCSP and cover all the main sectors of relevance to climate change, where identified in the NAPA and National Communications under the UNFCCC. Cambodia is also actively mainstreaming climate change resilience into sub-national planning and finance systems.

(2) Specifically on adaptation, Cambodia has undertaken initiatives to mainstream adaptation into national development, and in specific sectors such as in the agriculture, forestry and human health sectors, as well as coastal zone management. In addition to the CCCSP and the SCCSPs and SCCAPs, Cambodia has developed the National Adaptation Programme of Action to Climate Change (2006), in which coping mechanisms to hazards and climate change impacts are identified, as well as key adaptation needs.

(3) The National Adaptation Plan (NAP) process is being used in Cambodia to strengthen the ongoing climate change adaptation processes through cross-sectoral programming and implementation at national and sub-national levels. It may in turn inform future climate change strategies, financing frameworks, and national development planning and budgeting.

(4) Forestry related actions would be implemented as part of the national REDD+ Strategy. Cambodia is developing an operational National Forest Monitoring System (NFMS), Reference Emission Level to more accurately quantify GHG impacts of actions in this sector. This will form the basis of implementing and accounting for the forestry actions post 2020. Further, Forest Reference Emission Levels and Forest Reference Levels

(FREL/FRL) and a Safeguards Information System (SIS) will be used to account for the emissions reduced via the implementation of activities identified from 2016-2020.

Cambodia has already taken steps to ensure that its monitoring and evaluation (M&E) system includes indicators to measure progress, including INDC implementation, both for adaptation and mitigation. The monitoring, reporting and verification (MRV) system will build on the greenhouse gas inventory. In particular, continued support to develop the REDD+ MRV system is required, in order to enable Cambodia to move towards the third phase of REDD+ where it will receive performance-based payments. M&E for adaptation is currently carried out at project-level. A national M&E framework will be developed, while activities to operationalise it in key sectors have already begun.

The Annex to this INDC summarises the prioritised actions on climate change mitigation and adaptation, and the proposed related planning and implementation processes. It is expected that there will be stock-taking of progress and lessons learned in 2018 for the development of the action plans for the subsequent period.

5. Means of Implementation

Cambodia requires support in the form of financing, capacity building, and technology transfer to implement the actions set out in this INDC. Detailed analysis at the start of the INDC implementation will be necessary in order to align it with that of the climate change action plans and refine the estimation of funding requirements, in particular post 2018. This analysis will determine the precise nature and level of support needed, in particular with respect to capacity building and technology transfer.

The assessment of support needs will build on the climate change financing framework that has been developed in conjunction with the climate change action plans. This framework included an analysis of financing sources, costing, analysis of climate change impacts on the economy, and recommendations on financing modalities for the implementation of the CCCSP.

According to the assessment of financial needs for priority activities up to 2018 included in the sectoral climate change action plans, Cambodia would require 1.27 billion US\$ to support the implementation of these activities. The assessment also took into account the climate finance absorption capacity of Cambodia to ensure that the proposed investments are effective.

The international finance support needed would be additional to what Cambodia is allocating to implement its sustainable development plans to realise the identified positive impacts of GHG emission reduction activities. The Climate Change Financing Framework estimated that in 2012, expenditure on climate related policies and actions represented 6.5% of public expenditure, or 1.31% of national GDP. In the National Strategic Development Plan there is a

plan to increase the ratio of climate expenditure on GDP from an estimated 1.39% in 2015 to 1.5% in 2018.

The support received will be channelled through bilateral and multilateral mechanisms, including market based mechanisms. Cambodia is for example making progress in readiness for direct access to the Green Climate Fund (GCF), which may become the principal vehicle for climate finance in the future. Dedicated climate change funding from international sources, either from bilateral/multilateral donors or through global climate funds, represents only 40% of total climate related investment. The strategy will also focus on traditional development funds, as the climate-relevant portion of these funds from domestic and international sources too are an important financing support. As stated above Cambodia is already participating in REDD+ mechanism with respect to forestry related actions.

Sectoral climate change action plans contain indications of capacity building needs. Through consultations carried out to develop the INDC, the development of MRV and M&E systems has been identified as a priority. Though, as explained above the work has already been initiated, more work is needed to develop the MRV based on identified indicators.

Cambodia has developed technology needs assessment for adaptation and mitigation, and technology needs also feature prominently in the sectoral climate change action plans. At the start of the INDC implementation phase Cambodia will also need to carry out a detailed technology needs assessment.

Annex: Further Information Related to Climate Change Related Strategies and Policies

Cambodia intends to support the initial delivery of the INDC mainly through the implementation of the Cambodia Climate Change Strategic Plan (CCCSP) (2014 – 2023) (see table 1 below) through the following strategic priorities aims to develop towards a green, low-carbon, climate-resilient, equitable, sustainable and knowledge-based society.

The main CCCSP strategic objectives are to:

- Promote climate resilience through improving food, water and energy security
- Reduce sectoral, regional, gender vulnerability and health risks to climate change impacts
- Ensure climate resilience of critical ecosystems (Tonle Sap Lake, Mekong River, coastal ecosystems, highlands, etc.), biodiversity, protected areas and cultural heritage sites
- Promote low-carbon planning and technologies to support sustainable development
- Improve capacities, knowledge and awareness for climate change responses
- Promote adaptive social protection and participatory approaches in reducing loss and damage due to climate change
- Strengthen institutions and coordination frameworks for national climate change responses
- Strengthen collaboration and active participation in regional and global climate change processes.

The CCCSP sets out strategies and actions for different phases:

- In the immediate term (2013-2014): putting in place institutional and financial arrangements for the implementation of the CCCSP, development of national monitoring and evaluation (M&E) frameworks and indicators, and development of climate change action plans (2014 – 2018) by line ministries
- In the medium term (2013-2018): launch of high priority programmes with an initial focus on adaptation and gradual increase in mitigation actions, and accreditation of the Adaptation Fund and Green Climate Fund
- In the long term (2019-2023): the focus will be on research and learning, but its main objective will be to scale up successful initiatives and to continue mainstreaming climate change into national and sub-national programmes.

Table A1 provides a comprehensive list of climate change related strategies and policies under the CCCSP.

Table A1: INDC planning and implementation processes and their link to existing climate change strategies and plans

Priority actions	Existing climate change strategy and plan
<i>Adaptation</i>	
Promoting and improving the adaptive capacity of communities and restoring the natural ecology system to respond to climate change	Implementation of Climate Change Action Plan for Environment and Protected Area (2014-2018)
Implementing measures of management and protection of areas to adapt to climate change	Implementation of Climate Change Action Plan for Environment and Protected Area (2014-2018)
Strengthening climate information and early warning systems	Implementation of Climate Change Action Plan for Water Resources and Meteorology (2014-2018)
Developing and rehabilitating the flood protection dykes for agricultural/urban development	Implementation of Climate Change Action Plan for Water Resources and Meteorology (2014-2018)
Increasing the use of mobile pumping stations and permanent stations in responding to mini-droughts, and promoting groundwater research in response to drought and climate risk	Implementation of Climate Change Action Plan for Water Resources and Meteorology (2014-2018)
Developing climate-proof tertiary-community irrigation to enhance the yields from agricultural production of paddy fields	Implementation of Climate Change Action Plan for Rural Development (2014-2018)
Promoting the climate resilience of agriculture through building sea dykes in coastal areas and scaling-up of climate-smart farming systems	Implementation of Climate Change Action Plan for Water Resources and Meteorology (2014-2018); and Climate Change Action Plan for Agriculture, Forestry and Fisheries (2014-2018)
Developing crop varieties suitable to Agro-Ecological Zones (AEZ) and resilient to climate change (include coastal zones)	Implementation of Climate Change Action Plan for Agriculture, Forestry and Fisheries (2014-2018)
Promoting aquaculture production systems and practices that are adaptive to climate change	Implementation of Climate Change Action Plan for Agriculture, Forestry and Fisheries (2014-2018)
Repairing and rehabilitating existing road infrastructure and ensuring effective operation and maintenance, taking into account climate change impacts	Implementation of Climate Change Action Plan for Public Works and Transport (2014-2018)

Priority actions	Existing climate change strategy and plan
Up-scaling the Malaria Control Program towards pre-elimination status of malaria	Implementation of Climate Change Action Plan for Public Health (2014-2018)
Up-scaling of national programmes on acute respiratory infection, diarrhoeal disease and cholera in disaster-prone areas, including conducting surveillance and research on water-borne and food-borne diseases associated with climate variables	Implementation of Climate Change Action Plan for Public Health (2014-2018)
Strengthening technical and institutional capacity to conduct climate change impact assessments, climate change projections, and mainstreaming of climate change into sector and sub-sector development plans	Implementation of recommendations from the draft SNC
Mitigation	
<p><u>Energy Industries</u></p> <p>Grid connected renewable energy generation (solar energy, hydropower, biomass and biogas) and connecting decentralised renewable generation to the grid</p> <p>Off-grid electricity such as solar home systems, hydro (pico, mini and micro)</p> <p>Promoting energy efficiency by end users</p>	Implementation of Climate Change Action Plan for Manufacturing Industry and Energy Sectors (2014-2018)
<p><u>Manufacturing Industries</u></p> <p>Reducing emissions as a result of rice milling, garment, and brick works</p>	Implementation of Climate Change Action Plan for Manufacturing Industry and Energy Sectors (2014-2018)
<p><u>Transport Sector</u></p> <p>Motor vehicle inspection, public transport and improving efficiency of vehicles</p>	Implementation of Climate Change Action Plan for Transport Sector (2014-2018)
<p><u>Other Sectors</u></p> <p>Efficient cookstoves, biodigesters, water filters</p>	Implementation of Climate Change Action Plan for Manufacturing Industry and Energy Sectors (2014-2018)
<p><u>Forestry</u></p> <p>Increasing forest cover to 60% of national land</p>	Implementation of: National Forest Programme 2010-29; Climate Change

Priority actions	Existing climate change strategy and plan
area, and maintaining that level from 2030 onwards	Action Plan for Agriculture, Forestry and Fisheries Sector (2014-2018); REDD+ Strategy

REPUBLIQUE DU CAMEROUN



CONTRIBUTION PREVUE DETERMINEE AU PLAN NATIONAL (CPDN) INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

1. Contexte national

Données clés

Superficie (km ²)	475 440
Climat	Très variable selon les 5 zones agro-écologiques, cf. note de bas de page 2
Population (2013)	22 253 000
PNB (Mds US\$ 2014)	32,5
PNB / hab (US\$ 2013)(US\$ PPA 2013)	1 308 (2 400)
Part de l'agriculture dans le PIB et l'emploi total (2014)	20% et 60%
Consommation énergie primaire (Mtep 2012)	6,98
Consommation d'énergie primaire / hab (tep 2012)	0.32
Part des énergies fossiles dans la consommation primaire (2012)	28%
Part des énergies fossiles dans le bouquet électrique (2014)	46%
Capacité électrique installée raccordée (2013)	1 400 MW
Taux d'électrification	51%

Sources : Sources nationales ; Banque mondiale ; Délégation UE à partir de diverses sources.

La CPDN du Cameroun est ancrée dans la vision que le pays a dessinée pour son devenir à l'horizon de 2035 : celle de devenir un pays émergent. Cet objectif global s'accompagne d'un ensemble d'objectifs intermédiaires : (i) la réduction de la pauvreté ; (ii) l'atteinte du stade de pays à revenus intermédiaires, (iii) l'atteinte du stade de Nouveau Pays Industrialisé et (iv) la consolidation du processus démocratique et de l'unité nationale dans le respect de la diversité qui caractérise le pays. En termes économiques, cela impliquera notamment une croissance soutenue, une révolution agricole fondée sur l'augmentation de la productivité, et un doublement de la part du secteur secondaire dans la structure du PIB (de 19 à 38%).

Le Cameroun est un faible émetteur de GES (2^e Communication nationale). Cette stratégie ambitieuse de développement se traduira par une hausse forte des émissions.

Au travers de cette CPDN, le Cameroun entend réduire l'empreinte carbone de son développement sans ralentir sa croissance, en privilégiant des options d'atténuation présentant des cobénéfices élevés (**Section 2 : Atténuation**) ; renforcer la résilience du pays aux changements climatiques (**Section 3 : Adaptation**) ; mettre en cohérence ses politiques sectorielles et renforcer son dispositif et ses outils de mise en œuvre pour faciliter l'atteinte de ces objectifs (**Section 4**) ; et mobiliser à cet effet tous les moyens pertinents : financements, transferts de technologies et renforcement de capacités (**Section 5**).

2. Atténuation

La Contribution du Cameroun

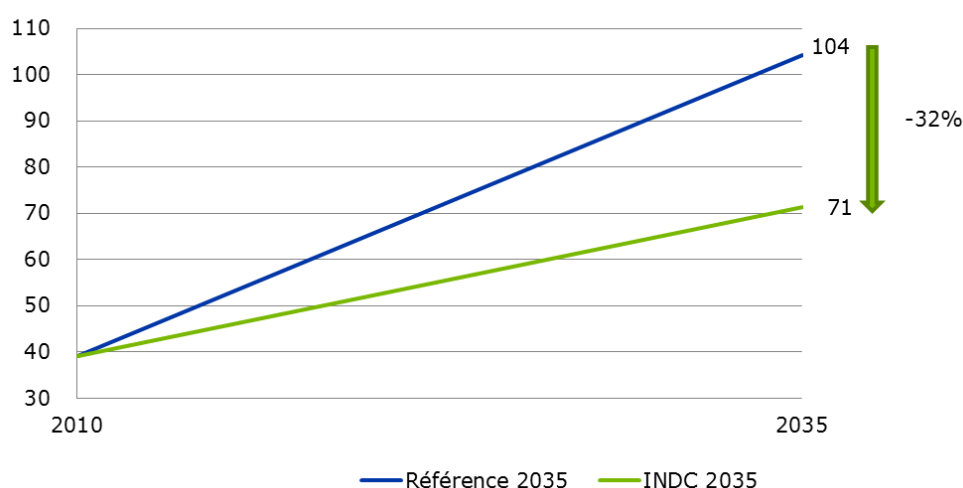
Type de contribution	Un objectif de réduction des émissions assorti d'actions d'atténuation et d'adaptation
Objectif national à long terme sur les émissions de GES	Réduction des émissions de GES à hauteur de 32% par rapport à un scénario de référence pour l'année cible (2035), et conditionnée au soutien de la communauté internationale sous forme de financement, d'actions de renforcements de capacité et de transfert de technologies.
Année cible	2035
Année de référence	2010
Objectifs sectoriels principaux	Scénario CPDN: (i) verdissement (intensification, sédentarisation) de la politique agricole ; (ii) gestion durable des forêts (iii) augmentation de l'offre énergétique et amélioration de l'efficacité énergétique; (iv) 25% d'énergie renouvelable dans le bouquet électrique à l'horizon 2035.
Ambition de la Contribution	L'objectif de réduction des émissions du Cameroun représente un effort significatif pour un pays dont les émissions sont insignifiantes à l'échelon international et dont le PIB par habitant se situe au 148ème rang mondial (2013, en base PPP).
Equité de la Contribution	La réduction de 32% en 2035 est du même ordre ou supérieure à celle proposée par des pays comparables ou de la sous-région. Ce niveau d'engagement tient compte des efforts accomplis ou en cours pour réduire les émissions / augmenter les puits de carbone (reboisement, gestion durable des forêts).

Scenarii de référence et de développement sobre en carbone (CPDN)

Les graphiques ci-après présentent (i) un scénario de référence dans lequel aucune intervention publique nouvelle ne vient tempérer les émissions liées au développement du Cameroun et (ii) un scénario CPDN de développement sobre en carbone (à PIB et niveau de développement identiques) montrant l'impact des grandes actions sectorielles d'atténuation. Ce scénario CPDN est conditionné au soutien de la communauté internationale sous forme de financement, d'actions de renforcements de capacité et de transfert de technologies.

Dans le scénario de référence, les émissions de GES atteignent 104 MtCO₂-équ. en 2035, soit une hausse de 166% par rapport à 2010. Dans le scénario CPDN, l'augmentation des émissions est contenue à 71 MtCO₂-équ. en 2035, soit une hausse de 82% par rapport à 2010 (39 MtCO₂-équ.). En d'autres termes, l'augmentation des émissions par rapport à l'année de base est réduite de moitié (32 contre 65 MtCO₂-équ.).

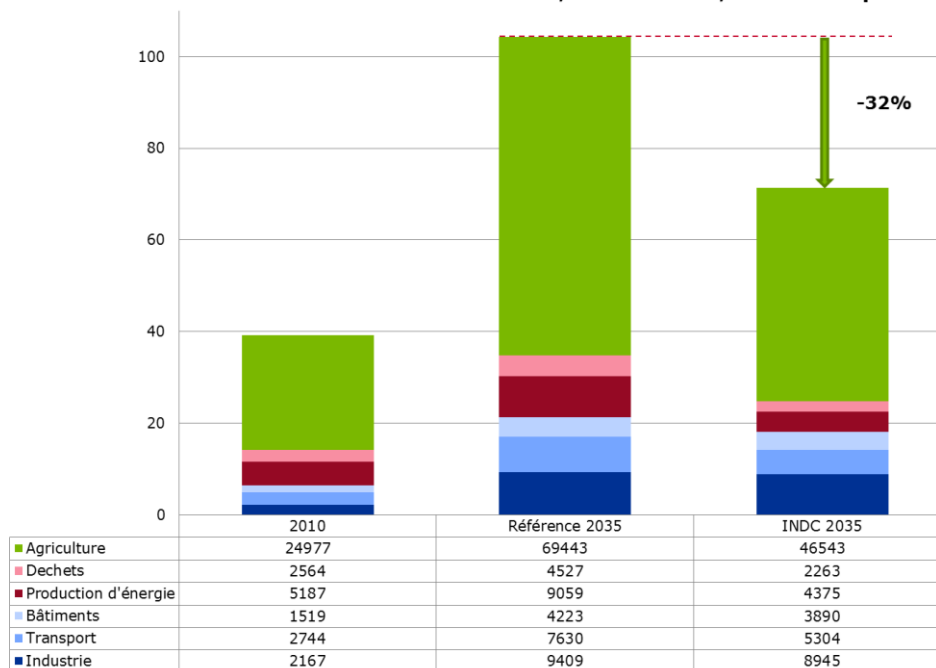
Evolutions des émissions de GES du Cameroun suivant les différents scénarios (MtCO₂eq)



Hypothèses et approches méthodologiques

Type d'objectif	Réduction en pourcentage par rapport aux émissions de l'année cible dans un scénario de référence.
Couverture (du pays)	Tout le pays.
Gaz couverts	Dioxyde de carbone (CO ₂), méthane (CH ₄), oxyde nitreux (N ₂ O)
Secteurs/sources couverts	Agriculture, Energie, Forêt, Déchets – (hors UTCATF pour l'objectif de réduction)
Scénario de référence	Ce scénario décrit l'évolution des émissions de GES à l'horizon 2035 par secteur d'activité en fonction des stratégies de développement actuelles.
Scénario d'atténuation CPDN	Ce scénario décrit l'évolution des émissions de GES à l'horizon 2035 sur la base d'orientations bas carbone dans les principaux secteurs d'activité, notamment énergie et agriculture.
Sources pour les scénarii	Données AIE, Banque mondiale, Enerdata, EDGAR, FAO, PNUE; Stratégies de développement (Cameroun Vision 2035, DSCE), Stratégies sectorielles (PDSE, PNIA, etc.).
Pouvoir de réchauffement global (PRG)	Les valeurs de PRG utilisées sont celles déterminées par le Groupe intergouvernemental des experts sur le climat (GIEC, AR4).
Emissions de l'année de référence	L'inventaire de l'année de référence est construit sur la base des données AIE, FAO et EDGAR. Données à revoir lors du prochain inventaire.
Méthodologie de projection des émissions du scénario de référence	Le scénario de référence est construit en appliquant aux émissions des différents secteurs des hypothèses d'évolution dépendant des taux de croissance sectoriels, de l'évolution de la population, du bouquet énergétique et de l'évolution tendancielle de l'efficacité du secteur.
Méthodologie de projection pour le scénario CPDN	Le scénario CPDN est construit en appliquant aux émissions sectorielles du scénario de référence une estimation des réductions découlant de la mise en place des Actions sectorielles – agriculture, forêt, déchets, énergie (par ex. bouquet électrique 25% EnR : 11% micro-hydro ; 7% biomasse ; 6% solaire PV ; 1% éolien).
Approche concernant les émissions relatives à l'affectation des terres, les changements d'affectation et la foresterie (UTCATF)	Les émissions de ce secteur important au Cameroun devront faire l'objet d'une analyse plus précise d'ici 2020 pour pouvoir être intégrées à l'objectif général. Cela pourra se faire grâce notamment à une meilleure connaissance des superficies par type de sols.

Emissions de GES au Cameroun, hors UTCATF, en MtCO₂eq



Actions d'atténuation

Le Cameroun entend mettre en œuvre les Actions d'atténuation suivantes, en cohérence avec ses orientations de développement.

Agriculture / Pêche / Elevage / Forêt

Grands enjeux du secteur agriculture/élevage/pêche: (i) Recherche de l'autosuffisance, sécurité alimentaires, développement de l'agro-industrie et (ii) Amélioration de la productivité et de la compétitivité.

Grands enjeux du secteur forestier: (i) Gestion durable des forêts par l'exploitation et valorisation des forêts productives dans le cadre de plans d'aménagement, (ii) Contribution à la croissance économique et à la lutte contre la pauvreté à travers la rétrocession d'une partie des recettes fiscales aux collectivités, la création d'emplois, la création de forêts communales dans le DFP et de forêts communautaires dans le DFNP (iii) Conservation de la biodiversité à travers le renforcement du réseau national d'aires protégées, (iv) Mise en cohérence du système foncier grâce aux plans de zonage.

→ MESSAGE CLE : « L'agriculture a été et demeure le pilier de l'ambition d'émergence du pays mais il est possible et même nécessaire de limiter son impact carbone. La gestion durable des forêts permettra d'augmenter le puits carbone. Cette croissance bas-carbone apportera d'importants cobénéfices (développement économique et social, création d'emplois, amélioration de l'environnement et de la santé, etc.) »

Orientation	Actions	Analyse coûts-bénéfices
1) Mise en cohérence de la planification et de l'aménagement de l'espace rural pour développer l'agriculture tout en limitant la déforestation / dégradation	<ul style="list-style-type: none">- Assurer la cohérence entre les plans de développement agricole et les stratégies de limitation de la déforestation ou de la dégradation (processus REDD+) grâce au Schéma national d'aménagement et du développement durable du territoire (prévu pour 2017) en concertation avec chacune des filières et les territoires ;- Créer les conditions favorables au développement du secteur en améliorant la gouvernance en impliquant tous les acteurs concernés et en s'appuyant sur la décentralisation, afin d'assurer de façon efficace et efficiente la planification, la programmation, la budgétisation, la mobilisation des financements, la mise en œuvre et le suivi-évaluation du développement du secteur rural ;- Renforcer la gestion durable et la valorisation des forêts et de la biodiversité, notamment grâce au suivi spatial des terres ;- Favoriser la réhabilitation des terres dégradées et le reboisement des savanes anthropiques, et renforcer les puits de carbone dans les forêts dégradées ;- Développer les infrastructures de base qui permettront d'améliorer la logistique des transports de produits agricoles, d'élevage et de pisciculture.	<p>Impacts sur les émissions de gaz à effet de serre:</p> <p>L'évaluation de l'impact de ces stratégies agricoles ou forestières nécessiterait une collecte de données fiables et mesurables. Un exercice simplifié a toutefois pu être mené pour évaluer les tendances:</p> <ul style="list-style-type: none">- Le scénario de référence, basé sur l'hypothèse de croissance du secteur agricole, aboutit à une multiplication par 3 des émissions de gaz à effet de serre du secteur en 2035 par rapport à l'année de référence.- Le scénario bas-carbone permettrait une diminution de 33% des émissions en 2035 par rapport au scénario de référence.
2) Intensification d'une production agricole, animale et halieutique respectueuse de l'environnement et permettant de limiter la déforestation / dégradation	<ul style="list-style-type: none">- Découpler la production agricole de la déforestation / dégradation via l'intensification des pratiques agricoles durables sur l'environnement et l'agroforesterie (notamment grâce à la sécurisation du foncier) ;- Favoriser l'utilisation de semences améliorées à haut rendement et résistantes aux facteurs contraires de l'environnement (hors OGM et hybrides) ;- Développer les espèces à haut rendement, à cycle court et permettant de faire des rotations rapides ;- Renforcer les partenariats et collaborations pour améliorer la productivité des sols, la mise en œuvre d'innovations agricoles ; développer l'agriculture raisonnée, conservatoire ou durable ;- Développer une mécanisation efficiente de l'agriculture et améliorer les infrastructures de transformation et de conditionnement afin de rallonger la chaîne de valeur ;	<p>Cobénéfices du développement agricole et de la stratégie de limitation de la déforestation:</p> <ul style="list-style-type: none">- développement des infrastructures et mise à disposition d'équipements permettant une amélioration de la qualité de vie, notamment dans le milieu rural ;- amélioration de la productivité et de la croissance agricole permettant l'amélioration de la compétitivité, la création de richesses et la réduction de la pauvreté ;- stimulation de la création d'industries

	<ul style="list-style-type: none"> - Utiliser et valoriser durablement les ressources naturelles par la promotion équilibrée de l'ensemble des filières, en tenant compte des contraintes de conservation de l'environnement et l'adaptation aux changements climatiques. 	<p>légères à vocation agricole dans le milieu rural ;</p> <ul style="list-style-type: none"> - effets positifs sur l'économie sociale : création d'emplois en milieu rural (création de dizaines de milliers d'emplois formels par an dans les dix prochaines années) ;
<p>3) Promotion des pratiques permettant d'améliorer les capacités de production agricole et valoriser les ressources du milieu</p>	<ul style="list-style-type: none"> - Promouvoir l'intégration agriculture-élevage, l'agroforesterie, et l'agriculture de conservation en particulier au niveau des plantations communautaires et privées ; - Améliorer la productivité agricole à travers la valorisation optimale des ressources en terres et en eau, l'amélioration du cadre de vie des producteurs ruraux et leur connexion aux marchés, l'amélioration de l'accès aux matériels, équipements et aux financements adaptés ; - Restaurer les sols organiques et promouvoir la recherche sur la gestion des ressources naturelles (notamment les sciences des sols et la physiologie pathologie et technologie post récolte) ; - Adapter les calendriers culturaux, et les techniques de production - Limiter les émissions de méthane de la riziculture en réduisant au maximum la submersion. 	<ul style="list-style-type: none"> - la conservation de la biodiversité permet le maintien de pools de gènes, d'espèces et d'écosystèmes tout en contribuant à la création d'emplois ; - développement du capital humain (encadrement, formation et organisation des producteurs, des éleveurs, des aquaculteurs et des forestiers) ; - autonomisation des femmes et protection des populations vulnérables et minorités ; - diminution de l'agriculture itinérante ; - amélioration de la situation alimentaire et nutritionnelle ; - développement des usages récréatifs de la forêt ; - meilleure résilience aux changements climatiques.
<p>4) Valorisation notamment énergétique des ressources en milieu rural y compris les déchets</p>	<ul style="list-style-type: none"> - Réduire la consommation non durable de bois de chauffage par exemple par la gestion durable du bois-énergie ; les foyers améliorés, et la promotion de la méthanisation et/ou de la butanisation dans l'espace rural ; - Développer la production d'énergie à base de déchets agricoles, notamment par la valorisation des cabosses de cacao, pommes d'anacarde, bagasses de canne à sucre, mélasse, effluents de manioc, paille de riz pour la production des briquettes ; etc. - Développer la production de compléments alimentaires pour animaux et poisson et autres produits (ensilage, etc.) ; - Développer l'utilisation de fumiers améliorés par compostage. 	<p>Coûts</p> <p>Le coût global de mise en œuvre du PNIA a été évalué à 15 000 milliards de FCFA (25 md US\$) sur la période 2014-2020. Le coût global de mise en œuvre de la stratégie 2020 forêt et faune pour la période 2013-2017 est évalué à 388 mln US\$.</p>

Energie / Déchets

Grands enjeux de l'énergie: (i) Améliorer l'accès des populations et des industries à l'électricité en quadruplant la capacité de production à l'horizon 2035 pour passer à 6GW ; (ii) accroître l'utilisation des énergies renouvelables dans la production d'électricité, surtout dans les zones difficilement raccordables au réseau électrique et (iii) faire de l'efficacité énergétique une priorité nationale.

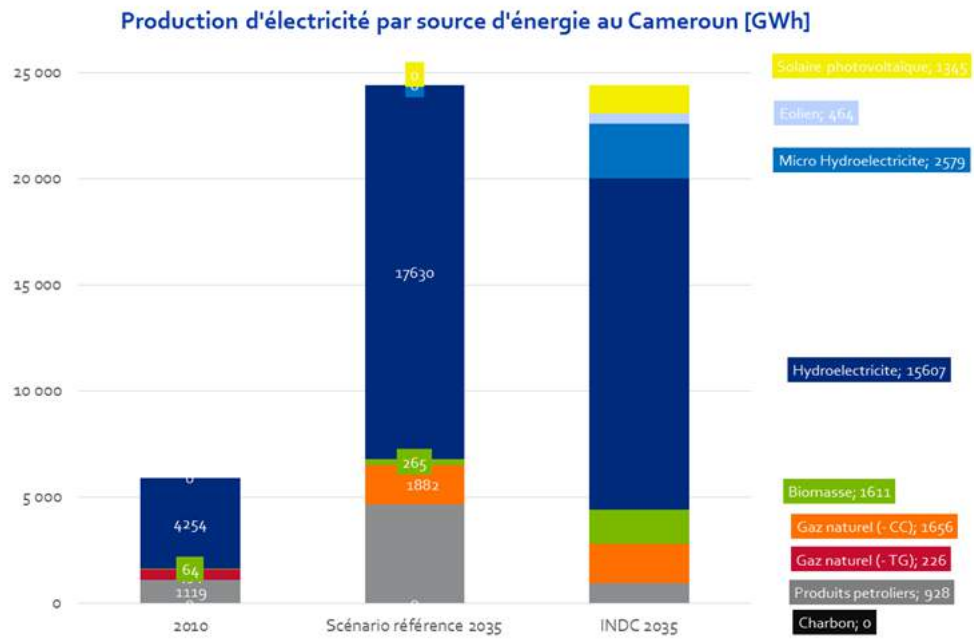
Grands enjeux des déchets: améliorer la salubrité urbaine notamment en faisant des déchets une ressource pour la production d'énergie

→ **MESSAGE CLE** : « Porter à 25% la part des énergies renouvelables hors grande hydro dans le bouquet électrique en 2035 »

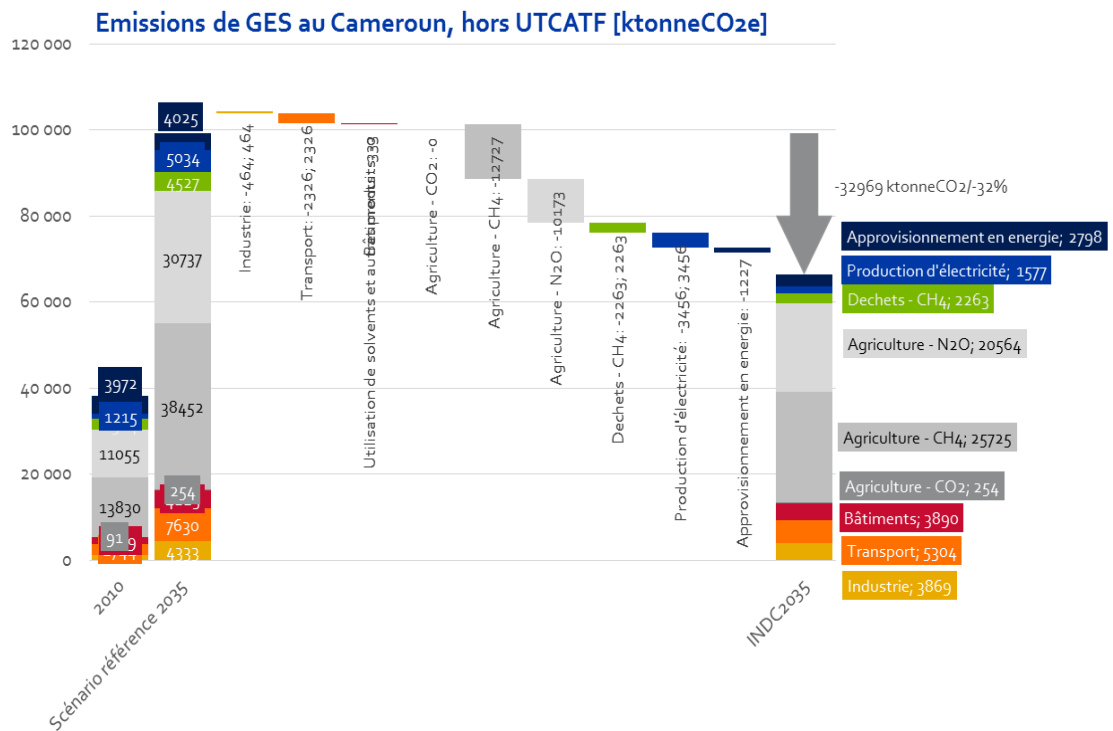
Orientation	Actions	Analyse coûts-bénéfices
5) Maîtrise de la consommation énergétique des systèmes par une politique d'efficacité énergétique volontariste	<p><u>Transversales:</u></p> <ul style="list-style-type: none">- Mettre en place d'une réglementation sur l'efficacité énergétique (EE) sur la base notamment du document « Politique Nationale, Stratégie et Plan d'Action pour l'Efficacité Energétique dans le secteur de l'électricité au Cameroun » (2014) avec un objectif d'économies d'énergie de 2 250GWh correspondant à 450MW de capacité installée à l'horizon 2025 ;- Créer et opérationnaliser l'Agence de promotion et de rationalisation de l'utilisation des énergies (APRUE)- Développer des incitations économiques pour promouvoir et lever les barrières à l'investissement dans l'EE ;- Interconnecter les 3 réseaux (Nord, Sud et Est) du Cameroun pour optimiser le transport et la distribution et réduire les pertes ;- Renforcer et promouvoir l'intégration et la participation du Cameroun dans le marché sous régional de l'Energie, à travers l'interconnexion avec les autres pays de la sous-région, notamment le Pool énergétique d'Afrique Centrale (PEAC) et l'Afrique de l'Ouest via le Nigéria (WAPP). <p><u>Industrie :</u></p> <ul style="list-style-type: none">- Encourager puis rendre obligatoires les audits énergétiques réguliers dans les grosses industries à forte intensité énergétique;- Sensibiliser et encourager les audits énergétiques dans les PME ;- Optimiser les procédés via des technologies plus efficaces ainsi que par le lissage et l'effacement ;- Evaluer les potentiels de substitution ou d'optimisation (par exemple cogénération ou valorisation) ;- Limiter les pertes (torchages, réseaux, gaspillage) par l'application des réglementations, ainsi que par des normes, tarifications et incitations. <p><u>Bâtiments :</u></p> <ul style="list-style-type: none">- Réviser le code du bâtiment pour améliorer la performance énergétique par des normes thermiques de construction et de rénovation, et un processus de certification ;	<p>Impacts sur les émissions de gaz à effet de serre:</p> <p>L'évaluation de cet impact nécessiterait une évaluation détaillée. Un exercice simplifié a toutefois pu être mené pour évaluer les tendances:</p> <ul style="list-style-type: none">- Le scénario de référence, basé sur les hypothèses de croissance des secteurs consommateurs d'énergie, et d'évolution du bouquet énergétique à 2035, se traduit par un quasi triplement des émissions de gaz à effet de serre énergétiques par rapport à l'année de référence, ainsi qu'à un doublement des émissions du secteur des déchets.- Le scénario bas-carbone, basé sur une amélioration de l'efficacité énergétique du système, et une évolution du bouquet énergétique, permettrait une réduction des émissions de 26% par rapport au scénario de référence. <p>Cobénéfices de la stratégie énergie-déchet</p> <ul style="list-style-type: none">- amélioration de la productivité des entreprises- stimulation de l'émergence de porteurs de projet énergétique (EE et EnR), ou 'éco-entrepreneuriat'- dynamisation de l'économie locale : création d'emplois qualifiés et pour tous les profils- renforcement du capital humain du

	<ul style="list-style-type: none"> - Former et organiser toute la chaîne de valeur à la construction/rénovation basse consommation ; - Réglementer et imposer l'étiquetage des appareils électriques. <p><u>Transport</u> : limiter la mobilité contrainte et développer les offres de transport bas-carbone</p> <ul style="list-style-type: none"> - Promouvoir une approche intégrée du secteur et le développement du transport bas-carbone via un Schéma national des infrastructures de transport ; - Intégrer une dimension énergie/climat dans les documents de planification territoriale afin de tenter de limiter les distances, de travailler sur la mixité fonctionnelle et de proposer des politiques de transport en commun efficiente ; - Accompagner l'Etat et les collectivités territoriales dans l'élaboration de plans de développement de transport collectif intra et interurbain bas carbone (ex tramway Yaoundé et Douala); - Favoriser l'achat de véhicules peu polluants et la mise au rebut des plus polluants via des normes, incitations ou obligations. 	<p>Cameroun (encadrement, formation et organisation des filières).</p> <ul style="list-style-type: none"> - diminution des congestions et de la pollution locale (notamment les polluants à courte durée de vie) - meilleur résilience aux changements climatiques (diversification du bouquet électrique) <p>Coûts</p> <p>Le montant total des investissements nécessaires pour la mise en œuvre du PDSE à l'horizon 2035 a été évalué à 8 270 md de FCFA (scénario médian).</p> <p>Une évaluation simplifiée du coût de mise en œuvre du bouquet électrique proposé dans le scénario bas carbone n'a pas montré de surcoût financier significatif (en base LCOE) mais devra être précisée dans une étude ultérieure.</p>
<p>6) Valorisation efficiente des ressources pour tendre vers une économie circulaire</p>	<ul style="list-style-type: none"> - Renforcer les politiques de gestion des déchets (d'ici à 2035, toutes les grandes villes devraient avoir des décharges aménagées avec au moins 70% de captage de méthane) ; - Promouvoir le développement d'une économie circulaire ; - Récupérer / utiliser les déchets agricoles et forestiers ; compostage ; - Valorisation / traitement des autres déchets (station d'épuration, boues de vidange, etc.). 	
<p>7) Développement de la production d'énergie à partir de sources renouvelables</p>	<ul style="list-style-type: none"> - Réaliser une évaluation exhaustive du potentiel des énergies renouvelables (l'étude partielle d'Invest'Elec a recensé 262 sites de petite hydro et 25 sites de biomasse-énergie pour un total cumulé de 284MW de capacité. 35 projets pilote (23 hydro, 9 biomasse et 3 solaires PV) ont été identifiés ; - Adopter un plan de développement des énergies renouvelables portant à 25% la part des EnR dans le bouquet électrique à l'horizon 2035 ; - Mettre en place un cadre incitatif pour le développement des EnR (appel d'offre, tarifs de rachat, etc.) et lever les barrières à l'investissement (renforcement du cadre institutionnel, etc.) ; un projet de loi est à l'examen ; - Accélérer la mise en œuvre du Plan directeur d'électrification rurale développé par l'AER ; créer d'autres facilitations financières pour l'éclairage rural comme le Fonds d'électrification rurale (FER) ; promouvoir le développement des "mini-smart-grids" en zone rurale ; - Créer une Agence de promotion des énergies renouvelables ; - Améliorer la collaboration entre les instances existantes (FEICOM, PNDP, et l'AER) pour le développement des projets communautaires en EnR. 	

Le schéma ci-dessous présente les **hypothèses d'évolution du bouquet électrique** dans les différents scénarii :



Le schéma ci-dessous montre la **part relative des différents secteurs dans l'atteinte de l'objectif global** proposé:



3. Adaptation

En juin 2015 le Cameroun a validé un Plan national d'adaptation aux changements climatiques (PNACC) qui inclut, entre autres, une évaluation des évolutions du climat dans chacune des cinq zones agro-écologiques¹, une évaluation de la sensibilité, de la vulnérabilité et de la résilience sectorielles et géographiques, une stratégie d'intervention 2016-2025, une évaluation des pertes, risques et lacunes, un plan d'action quinquennal 2016-2020 décliné en 20 fiches-projets détaillées.

La vision du PNACC est qu'en 2035, « *les changements climatiques dans les cinq zones agro-écologiques du Cameroun sont complètement intégrés au développement durable du pays, réduisant ainsi sa vulnérabilité, et transformant même le problème des changements climatiques en une solution / opportunité de développement. Ainsi les Camerounais – particulièrement les femmes, les enfants et les personnes vulnérables – et les secteurs économiques du pays acquièrent une plus grande résilience et une plus grande capacité d'adaptation aux impacts négatifs des changements climatiques* ».

Afin d'atteindre ce résultat, le PNACC a présenté un programme stratégique basé sur 4 axes :

Axe stratégique 1 : Améliorer les connaissances sur les changements climatiques

Recommandations : Soutenir la recherche ; Affiner les scénarios climatiques, Vulgariser les informations climatiques ; Mettre en place un système d'observation, d'information et d'alerte ; Constituer une base de données pour les suivi d'indicateurs et le MRV.

Axe stratégique 2 : Informer, éduquer et mobiliser la population camerounaise pour s'adapter aux changements climatiques

Recommandations : Les communautés et les groupes vulnérables sont les cibles prioritaires ; Soutenir les actions de plaidoyers ; Mener des mobilisations communautaires ; Favoriser les actions d'IEC ; Utiliser les medias de proximité et traditionnels ; Partager les expériences d'adaptation.

Axe stratégique 3 : Réduire la vulnérabilité aux changements climatiques dans les principaux secteurs et zones agro-écologiques du pays

Recommandations : Evaluer les coûts ; Financer des études et mesures concrètes ; Concevoir des mécanismes financiers d'incitation.

Axe stratégique 4 : Intégrer l'adaptation aux changements climatiques dans les stratégies et politiques sectorielles nationales

Recommandations : Prendre en compte l'adaptation dans les planifications et les budgétisations nationale et locales ; Intégrer le CC dans le schéma d'Aménagement du Territoire ; Mener des études spécifiques pour mieux cerner les risques ; Participer aux échanges internationaux.

Douze secteurs économiques ont été pris en compte dans chacune des 5 ZAE pour évaluer leur vulnérabilité aux paramètres précédents :

- huit secteurs thématiques : Agriculture, Élevage, Pêche et aquaculture, Foresterie, sylviculture et faune, Eau, assainissement et santé, Énergie, mines et industries, Développement urbain et travaux publics, Tourisme ;
- quatre secteurs transversaux, conformément à la DSCE : Éducation, recherche et formation professionnelle, Artisanat et économie sociale, Télécommunications, Genre, population vulnérable, protection sociale et solidarité nationale.

¹ Le pays est divisé en 5 Zones agro-écologiques (ZAE) : 1 Zone soudano-sahélienne, 2 Zone des hautes savanes guinéennes, 3 Zone des hauts plateaux, 4 Zone à pluviométrie bimodale, 5 Zone à pluviométrie monomodale

L'analyse des impacts et la vulnérabilité par ZAE et par secteur nous montre que :

- Les zones les plus vulnérables sont : la ZAE soudano sahélienne et la ZAE côtière à pluviométrie monomodale ;
- Les secteurs les plus vulnérables sont (i) l'agriculture, et (ii) l'eau l'assainissement et la santé ;
- Environ 320 000 personnes sont annuellement exposées aux catastrophes climatiques.

La vulnérabilité sera globalement forte à très forte dans les zones 4 et 5, forte à moyenne dans le reste du pays mais avec des tendances fortes dans les massifs forestiers ou montagneux. Malgré la forte variabilité par ZAE, on peut estimer que pour les secteurs :

- Agriculture : La vulnérabilité sera globalement forte à très forte dans les zones 1, 2 et 4, forte à moyenne dans le reste du pays (sécheresses, hausse des températures) ;
- Élevage: La vulnérabilité sera globalement forte à très forte dans les zones 1, 2 et 3, forte à moyenne dans le reste du pays (sécheresses, hausse des températures) ;
- Pêche et aquaculture : La vulnérabilité sera globalement forte à moyenne dans tout le pays, surtout dans les zones 5, 1, et 4, forte à moyenne dans le reste du pays (sécheresses, hausse des températures) ;
- Foresterie, sylviculture et faune : La vulnérabilité sera globalement forte à très forte dans les zones 4 et 5, forte à moyenne dans le reste du pays mais avec des tendances fortes dans les massifs boisés (sécheresses, évènements extrêmes) ;
- Eau, assainissement et santé : La vulnérabilité sera globalement forte à très forte dans les zones 4 et 5, forte à moyenne dans le reste du pays mais avec des tendances fortes dans les massifs boisés (sécheresse, inondations et mouvement de terrain) ;
- Énergie, mines et industries : La vulnérabilité sera globalement forte à très forte dans les zones 5 et 2, forte à moyenne dans le reste du pays (précipitations, sècheresse, montée du niveau de la mer) ;
- Développement urbain et travaux publics : La vulnérabilité sera globalement forte à très forte dans les zones 5 et 4, forte à moyenne dans le reste du pays (inondations, montée du niveau de la mer) ;
- Tourisme : La vulnérabilité sera globalement moyenne à faible dans le pays, sauf dans les massifs montagneux et la zone 1 (Sècheresse).

La stratégie d'intervention 2016-2025 (non chiffrée) débouche sur un **plan d'action quinquennal préliminaire 2016-2020**, décliné en 20 fiches programmes regroupées ci-après par thématiques générales. Les fiches 1 à 5 concernent des projets transversaux, les fiches 6 à 20 les projets sectoriels. En général le Maître d'ouvrage sera le MINEPAT, assisté par une ou plusieurs structures techniques (Ministère ou Comité de coordination interministériel) agissant en tant que Maître d'ouvrage délégué ou Maître d'œuvre. Les montants indiqués, soit 1,8 milliards de dollars sur 5 ans, sont indicatifs, basés 1) sur le montant de 16\$ par an et par habitant proposé par la Banque Mondiale pour l'Afrique Sub-saharienne² et 2) sur la hiérarchie des priorités sectorielles du Gouvernement camerounais. Des études complémentaires permettront une ventilation de ces budgets en projets confiés aux divers partenaires :

² Banque Mondiale, 2010, *The cost to developing countries of adapting to climate change : New methods and estimates*.

Thématiques générales / Programmes	mIn \$	%	Maitre d'ouvrage délégué / Maître d'œuvre
Agriculture, Elevage, Pêche			
Programme 16 : Développement d'une agriculture intégrée et résiliente face aux effets des changements climatiques: aménagement de l'espace, choix des techniques agronomiques et intensification; Gestion des besoins en eau; développement de l'agriculture durable /conservatoire / durable; gestion des pollutions hydriques; gestion et exploitation des déchets	385	21%	Comité de coordination (MINADER, ministères sectoriels concernés et structures faitières)
Programme 17 : Réduction de la vulnérabilité de l'élevage aux effets des changements climatiques (REVEECC): Gestion des pâturages, des points d'eau; Gestion de l'espace, cartographie des terroirs; amélioration de l'agriculture itinérante; production fourragère			MINEPDED et MINEPIA
Programme 18: Réduction des effets des changements climatiques sur le secteur halieutique: Adaptation de la pêche, de l'aquaculture, de la pisciculture			MINEPIA
Aménagement du territoire / gestion des risques			
Programme 01 : Mettre à niveau les systèmes nationaux de collecte de données hydro - météorologiques, d'analyse, de prévision, d'information, d'alerte précoce, et renforcement des capacités	600	33%	MINTRANSPORT, MINATD, MINEPDED
Programme 02 : Actualisation des plans de contingence national, régionaux et départementaux, accroissement et opérationnalisation du fonds d'urgence			MINADT, MINEPDED, MINFI
Programme 03 : Développement des programmes Risques climatiques et Plan d'Affectation des Terres: Cartographie des terroirs; Schémas directeurs d'aménagement national, provinciaux, départementaux, communautaires; Système de suivi.			MINCAF
Programme 05 : Protection et aménagement du littoral contre les effets des changements climatiques; Restauration et gestion des mangroves; Utilisation des ressources; Adaptation des infrastructures			MINEPDED, MINDEF, MINEPIA et MINDCAF
Programme 07 : Adaptation des référentiels techniques de construction des infrastructures aux effets des changements climatiques			MINTP, MINEPAT, MINMAP et ONACC
Programme 08 : Réduction de la vulnérabilité des populations urbaines aux effets des changements climatiques			MINHDU
Programme 09 : Amélioration de la gouvernance foncière locale en réponse aux changements climatiques	MINDCAF, MINATD		
Energie, Industrie			
Programme 11 : Changements climatiques et gestion intégrée de déchets ménagers, collecte et valorisation	310	17%	MINEPDED
Programme 12 : Diversification de l'offre énergétique dans un contexte de changement climatique			MINEE

Thématiques générales / Programmes	mIn \$	%	Maitre d'ouvrage délégué / Maître d'œuvre
Programme 15 : Prise des changements climatiques dans le développement des activités touristiques et artisanales: Utilisation des ressources par l'artisanat (eau, RN, etc.); Développement et adaptation des sites touristiques			MINPMEESA et MINTOUL
Programme 20 : Prise en compte du changement climatique dans le développement des industries au Cameroun: gestion de l'espace, protection des zones à risque climatique; approvisionnements en énergies, eau, services; déchets et pollutions, émission de GES.			MINEPDED, MINIMIDT
Forêts			
Programme 19 : Réduction de la vulnérabilité des forêts aux changements climatiques au Cameroun: inventaires, gestion et conservation des blocs forestiers, reconstitution du couvert forestier, surtout dans les zones sensibles (têtes de source, berges, etc.); agroforesterie villageoise; valorisation des déchets végétaux ; développement des transformations <i>in situ</i> ; conservation de la biodiversité; gestion des trafics et du braconnage; gestion des feux de brousse	150	8%	MINFOF et MINEPDED
Gestion des eaux / Santé / Social			
Programme 10 : Adaptation de la politique nationale genre et réduction de leur vulnérabilité au changement climatique			MINAS et MINPROF
Programme 13 : Renforcement et sécurisation de l'accès aux ressources en eau et aux services d'assainissement dans un contexte de changement climatique; sécurisation des services environnementaux; gestion des eaux de surface et des nappes phréatiques, protection des têtes de source; Fixation des berges et des sols; Rôle des femmes; plans d'utilisation des eaux de surface ou de profondeur; luttés contre les pollutions (agricoles, industrielles, sanitaires, etc.); prévention des évènements extrêmes (inondations); conservation de la biodiversité aquatique	300	16,5%	MINEE
Programme 14 : Renforcement des capacités d'adaptation du système de santé nationale face aux changements climatiques; Carte sanitaire; maladies émergentes; systèmes d'alerte			MINSANTE
Renforcement des capacités / Communication			
Programme 04 : Sensibilisation de la population, des professionnels, des administrations et des décideurs sur les effets des changements climatiques et sur les mesures à prendre			MINEPDED
Programme 06 : Éducation, formation professionnelle et renforcement des capacités sur le changement climatique: curricula et outils pédagogiques, formations spécialisées; formation continue; bourses d'études; appui à la recherche.	70	4%	MINESUP, MINESEC, MINEDUB, MINRESI, MINEPDED, MINEFOP
Totaux (2016-2020)	1 815	100%	

4. Processus de planification, mise en œuvre et suivi de la CPDN

Le Cameroun prendra les mesures suivantes pour mettre en œuvre cette CPDN, en assurer le suivi et le cas échéant l'actualisation.

	Description	Objectif
Cadre institutionnel	Intégrer les changements climatiques dans la planification nationale et les politiques sectorielles	Mise en cohérence des plans et politiques sectoriels avec les objectifs et Actions d'atténuation et d'adaptation
	Rendre opérationnel l'Observatoire national sur les changements climatiques (ONACC) créé en 2009. Le conseil d'orientation de l'ONACC est notamment en charge de la planification, de la coordination de la mise en œuvre, du suivi et de l'évaluation de la CPDN ; l'ONACC est particulièrement en charge du suivi-évaluation.	Assurer une mise en œuvre efficace d'une politique nationale transversale
	Evaluer l'impact climat de toute loi ou politique/programme/projet public nouveau (étude d'impact)	Intégrer le climat dans les processus de décision publique
Opérationnalisation de la CPDN	Traduire la CPDN en programmes opérationnels basés sur les stratégies sectorielles	Opérationnaliser la CPDN
	- Améliorer les systèmes d'établissement et de collecte des données sur les émissions (monitoring). - Réalisation d'un inventaire annuel	Obtenir des données fiables sur les émissions de GES
	Etudes complémentaires (à réaliser après soumission de la CPDN) : - affiner les coûts des Actions de la CPDN et quantifier leurs co-bénéfices - améliorer la connaissance de l'utilisation et la gestion des terres au Cameroun - évaluation du potentiel des énergies renouvelables - opérationnalisation du PNACC et options pour leur financement - évaluation de l'opportunité d'une fiscalité écologique	Chiffrer et affiner la description des Actions d'atténuation et d'adaptation de la CPDN
Suivi-évaluation (MRV)	Indicateurs : - émissions annuelles globales et sectorielles de GES - intensité carbone du PIB et des principaux secteurs en 2015, 2020, 2025, 2030 et 2035 - capacité annuelle installée en énergies renouvelables - indicateurs d'adaptation et de vulnérabilité (à préciser) - suivi de l'affectation des terres agricoles	Suivi de la mise en œuvre de la CPDN
	Codage des dépenses liées aux changements climatiques (par ex. sur la base des 'Rio Markers' développés par OCDE-CAD) dans le budget de l'Etat	Suivi des recettes et dépense climat dans le budget national
	Création d'un système de suivi de l'ensemble des dépenses et financements liés au climat	Suivi des ressources et dépenses nationales globales liées au climat
Communication	- campagne de communication fin 2015 sur CPDN et COP 21, en direction de la société civile - mise en place d'un site internet dédié sur la politique nationale en matière de changement climatique / CPDN, où les indicateurs supra seront publiés	
Actualisation de la CPDN	Périodicité : Révision à la lumière des résultats de la COP21, si nécessaire. Tous les 5 ans sauf indication contraire issue des COP	

5. Moyens de mise en œuvre

Financement	<i>Le Cameroun entend mobiliser les sources suivantes pour financer les Actions d'atténuation et d'adaptation de cette CPDN :</i>	
	<i>Financements privés</i>	Le Cameroun entend mobiliser des financements privés internationaux ou domestiques pour le co-financement des Actions de cette CPDN, particulièrement celles pouvant générer une rentabilité financière acceptable pour le secteur privé. A cet effet, le Cameroun s'attachera à renforcer la capacité des marchés financiers et système bancaire domestiques à mobiliser et déployer l'épargne nationale notamment sur les projets concourant à un développement sobre en carbone et résilient au changement climatique, ainsi que l'attractivité du Cameroun pour les IDE (climat des investissements).
	<i>Budget national</i>	Le Cameroun augmentera ses financements budgétaires en faveur des Actions de cette CPDN qui relèvent de la compétence de l'Etat et que ne pourrait pas financer l'assistance internationale. Cet effort de l'Etat peut prendre la forme soit de dépenses budgétaires directes soit transiter par des fonds spécifiques financés notamment à partir du budget de l'Etat.
	<i>Bailleurs de fonds / PTF</i>	Le Cameroun sollicitera l'appui des bailleurs de fonds et PTF (notamment en dons et assistance technique) pour le financement des Actions de cette CPDN.
	<i>Fonds vert pour le climat</i>	Le Cameroun réfléchit à l'opportunité de mettre en place une entité nationale éligible (accréditée) au FVC et autres organismes internationaux. Le Cameroun sollicitera aussi l'appui des entités régionales et multilatérales accréditées pour cofinancer les Actions de cette CPDN.
	<i>Marchés du carbone</i>	Le Cameroun soutient l'inclusion des marchés internationaux du carbone dans un accord post 2020 sur le climat et propose qu'un tel instrument, couplé à un régime comptable approprié, puisse être utilisé pour aider à financer certains investissements dans les infrastructures sobres en carbone et résilientes au changement climatique. Le Cameroun considère que certaines des Actions de cette CPDN, ou des actions supplémentaires, pourraient être financées en tout ou en partie par le transfert international d'actifs carbone en veillant au respect des principes d'intégrité de l'environnement et de transparence.
	<i>Autres instruments économiques</i>	L'opportunité de déployer des outils permettant de générer un signal prix sur le coût social du carbone (marché ou taxe carbone) et ainsi d'internaliser l'externalité carbone sera explorée
	<i>Première tranche quinquennale</i>	La CPDN est déclinée en tranches quinquennales. Une première tranche quinquennale d'Actions à financer sera présentée début 2016.
Renforcement des capacités	<i>Atténuation</i>	<p><u>A tous les niveaux</u> : lien entre développement, énergie et changement climatique ; suivi/évaluation des activités</p> <p><u>Décideurs</u> : intérêts d'intégrer la réflexion énergie-climat dans toutes les politiques sectorielles</p> <p><u>Opérateurs</u> : mise en œuvre du développement bas-carbone, par exemple :</p> <p><i>Agriculteurs</i> : Pratiques agricoles permettant une intensification soutenable de la production ; modes de gestion et valorisation des résidus agricoles.</p> <p><i>Foresterie</i> : Renforcement de la gestion durable des forêts, gouvernance, exploitation à faible impact, augmentation des taux de transformation, valorisation des déchets de la transformation.</p> <p><i>Energie</i> : Gestion durable du bois énergie, construction, diffusion et utilisation des foyers et fours améliorés, mise en place de plantation à des fins de bois-énergie.</p> <p><i>Entrepreneurs</i> : Les clefs du succès pour développer un projet d'énergie renouvelable en milieu rural ; valorisation de produits issus d'une</p>

	agriculture soutenable.
Adaptation	<p><i>Informar, éduquer et communiquer sur les risques climatiques</i></p> <ul style="list-style-type: none"> - Sensibiliser les populations sur les impacts du changement climatique - Développer les capacités des populations à anticiper les impacts et augmenter leur résilience <p><i>Système de Gestion de l'Information Environnementale</i></p> <ul style="list-style-type: none"> - Coordonner les activités de l'ONACC et de l'Observatoire national des risques (ONR) pour la prévision des évènements météorologiques et des impacts des changements climatiques. - Créer un réseau d'observation et de suivi de la dynamique du trait de côte à l'échelle nationale afin d'identifier les territoires à risque d'érosion côtière et examen d'un ou de plusieurs indicateurs traduisant la relation climat / érosion côtière. <p><i>Renforcer la résilience des pratiques productives</i></p> <ul style="list-style-type: none"> - Le renforcement des capacités des acteurs (surtout femmes jeunes et personnes âgées, peuples autochtones, agriculteurs, etc.) porte sur de nouveaux itinéraires techniques dans le cadre de modes de productions intensifiés et durables.
Transferts de technologie et R&D	<ul style="list-style-type: none"> - Développement des partenariats entre les entreprises et les centres de recherche sur le développement de solutions bas-carbone. - Meilleur accès à des outils (par exemple calage des cycles culturaux à la saison pluvieuse)

6. Annexes

Principales abréviations

AER	Agence d'électrification rurale
BAD	Banque africaine de développement
CC	Changements climatiques
CCNUCC	Convention cadre des Nations Unies sur le changement climatique
CES	Conservation des eaux et du sol
COP	Conférence des Parties (à la CCNUCC)
CPDN	Contribution prévue déterminée au plan national (= INDC)
DFP	Domaine forestier permanent
DFnP	Domaine forestier non permanent
DSCE	Document de stratégie sur la croissance et l'emploi
EE	Efficacité énergétique
EnR	Energies renouvelables
FAO	Food and Agriculture Organization
FCFA	Franc CFA
FEICOM	Fonds spécial d'équipement et d'intervention intercommunale
GES	Gaz à effet de serre
GIEC	Groupe intergouvernemental des experts sur le climat
IDE	Investissements directs étrangers
IFD	Institutions financières de développement
INDC	Intended Nationally Determined Contribution (= CPDN)
IREN	Institut de recherche sur les énergies renouvelables
LCOE	Levelized cost of electricity
MINADER	Ministère de l'agriculture et du développement durable
MINATD	Ministère de l'administration territoriale et de la décentralisation
MINEE	Ministère de l'eau et de l'énergie
MINEPAT	Ministère de l'économie, du plan et de l'aménagement du territoire
MINEPDED	Ministère de l'environnement, de la protection de la nature et du développement durable
MINEPIA	Ministère de l'élevage, pêche et industrie animale
MINHDU	Ministère de l'habitat et du développement urbain
MINFOF	Ministère de la forêt et de la faune
MINTRANS	Ministère des transports
Md	Milliard
Mln	Million
MtCO ₂ -équ	Millions de tonnes de dioxyde de carbone ou équivalents
Mtep	Millions de tonnes d'équivalent pétrole
NAMA	Nationally Appropriate Mitigation Actions
ONACC	Observatoire national sur les changements climatiques
OCDE	Organisation pour la coopération économique et le développement
PDSE	Plan de développement long terme du secteur électrique
PF	Politique forestière et Plan stratégique de mise en œuvre
PIB	Produit intérieur brut
PNDP	Programme national de développement participatif
PNUE	Programme des Nations Unies pour l'environnement
PPA	Parité des pouvoirs d'achat
PRG	Pouvoir de réchauffement global
PTF	Partenaires techniques et financiers
REDD+	Reduced Emissions from Deforestation and Forest Degradation
UE	Union européenne
UNECA	Commission économique des Nations Unies pour l'Afrique
US\$	Dollar des Etats Unis
UTCATF	Utilisation des terres, changements d'affectation des terres et forêts
ZAE	Zone agro-écologique

Sources

Transversales

Cameroun Vision 2035

Document de Stratégie pour la Croissance et l'Emploi (DSCE)

1ère communication nationale du Cameroun

2ème communication nationale du Cameroun

Loi N° 2013 / 004 du 18 avril 2013 fixant les incitations à l'investissement privé en République du Cameroun.

Décret N° 2009/410 du 10 décembre 2009 portant création, organisation et fonctionnement de l'Observatoire National sur les Changements Climatiques

Document de stratégie de développement du secteur rural

Inventaire national des GES 2013

Loi n°00211/008 du 06 mai 2011 d'orientation pour l'aménagement et le développement durable du territoire au Cameroun

Stratégie et Plan d'action national pour la biodiversité version 2, 2012

Atténuation (général)

Mesures d'atténuation, MINEPDED 2013

Energie

Fiche pays Cameroun de la Délégation de l'UE

Bilan des opportunités de projets de production décentralisée d'électricité identifiées par invest'Elec

Elaboration de la stratégie sectorielle eau et énergie – Variables d'action domaine énergie, 2011

Projet de loi portant promotion et développement des énergies renouvelables au Cameroun

Etat des lieux du cadre réglementaire du secteur des énergies renouvelables au Cameroun – Etude Global Village Cameroun, 2012

Livre Blanc de la CEEAC et de la CEMAC : Politique régionale pour un accès universel aux services énergétiques modernes et le développement économique et social 2014 - 2030

Plan d'Action National Energie pour la Réduction Pauvreté 2007

Plan Directeur Electrification Rurale, 2008

Politique nationale, stratégie et Plan d'Action pour l'Efficacité éner. dans le secteur de l'électricité 2014

Projet Développement du Secteur de l'Energie : Mise à jour du plan de développement du secteur de l'électricité - Etude Economique et financière avec Annexes 2014

Understanding the Impact of Climate Change on Hydropower in Cameroon 2013

Transport

Plan directeur routier du Cameroun - Plan directeur ferroviaire

Forêt

Composante REDD+_du PNDP 2013

Document R-PIN REDD+ du Cameroun, 2008 et Document R-PP REDD+ du Cameroun, 2013

Plan d'action national de lutte contre la désertification

Loi n° 94/01 du 20 janvier 1994 portant régime des forêts, de la faune et de la pêche 1994

Stratégie 2020 du sous secteur forêts et faune, 2012

Agriculture

Document de stratégie du sous secteur élevage, pêches et industries animales

Gestion durable des terres dans les plans de développement et élaboration des plans d'utilisation et de gestion durable des terres

Plan national d'investissement agricole (PNIA)

Projet d'amélioration de la compétitivité agricole (PACA)

Adaptation

Plan national d'adaptation aux changements climatiques, 2015

World Bank: The cost to developing countries of adapting to climate change : New methods and estimates, 2010

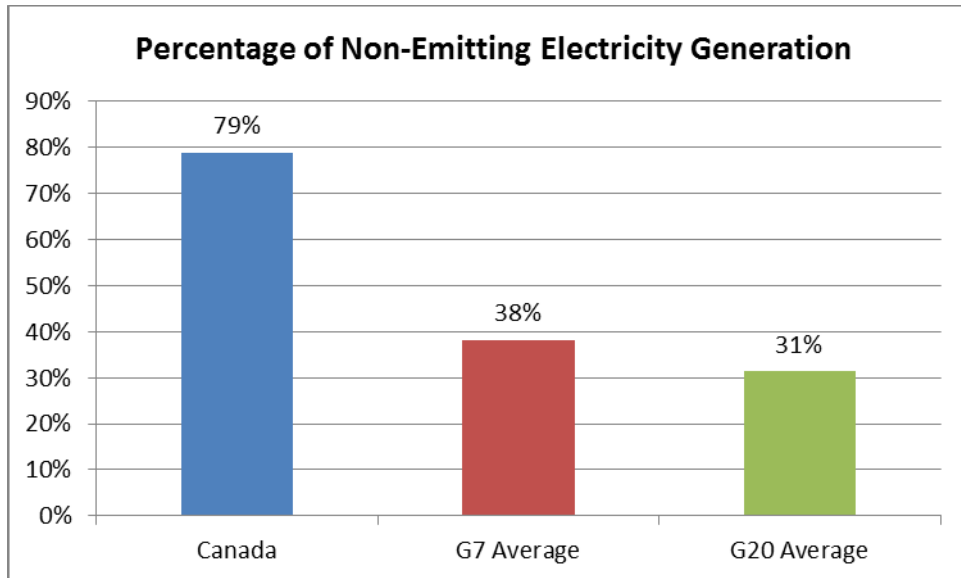
Etude de l'impact du changement climatique sur la Sanaga (Banque mondiale)

Vulnérabilité des Zones agro-écologiques aux changements climatiques

CANADA'S INDC SUBMISSION TO THE UNFCCC

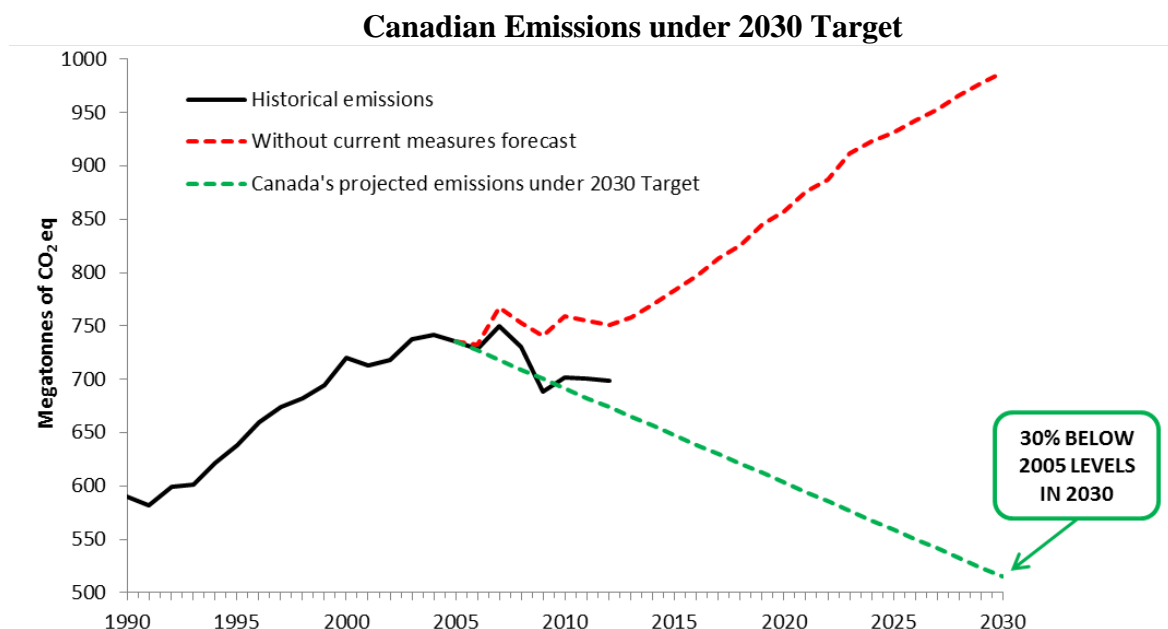
Canada is pleased to communicate our intended nationally determined contribution, as well as information to facilitate the clarity, transparency, and understanding of the contribution.

As a vast Northern nation, Canada faces unique challenges in addressing climate change: a growing population, extreme temperatures, a large landmass, and a diversified growing economy with significant natural resources are some of the circumstances influencing Canadian greenhouse gas emissions. Despite these challenges, Canada has one of the cleanest electricity systems among G-7 and G-20 nations and one of the cleanest in the world, with almost 80% of our electricity supply already emitting no greenhouse gases. Since 2011, Canada's per capita greenhouse gas emissions have been at their lowest levels since tracking began in 1990 while the economy has continued to grow.



Although Canada represents only 1.6% of the world's greenhouse gas emissions, Canada remains committed to doing our part to address climate change. As part of our contribution to a new global climate change agreement, Canada intends to achieve an economy-wide target to reduce our greenhouse gas emissions by 30% below 2005 levels by 2030.

This target is ambitious but achievable. It represents a substantial reduction from Canada's business-as-usual emissions. Canada has already undertaken decisive actions domestically to reduce our emissions, and is committed to doing more in concert with all major emitters. Reaching this ambitious target will require new policies in additional sectors and coordinated continental action in integrated sectors. Canada may also use international mechanisms to achieve the target, subject to robust systems that deliver real and verified emissions reductions.



Canada is making progress in reducing our emissions – from 2005 to 2013, Canadian greenhouse gas emissions decreased by 3.1% while the economy grew by 12.9%. The Government of Canada is implementing a responsible sector-by-sector regulatory approach to reduce emissions, aligned with Canada's major economic partners, like the United States, recognizing the importance of cooperative action in an integrated North American marketplace. Through this approach Canada has already taken steps to reduce emissions from two of the largest emitting sectors of the Canadian economy – transportation and electricity.

Building on the strong base of clean electricity generation, Canada has established stringent coal-fired electricity standards that ban the construction of traditional coal-fired electricity generation units, and will accelerate the phase-out of existing coal-fired electricity generation units. Canada has also taken action in the transportation sector, which is responsible for approximately 25% of Canada's emissions, by working closely with the United States towards common North American greenhouse gas standards for vehicles. The Government of Canada has put in place progressively more stringent greenhouse gas emission standards for passenger automobiles and light trucks as well as regulations for heavy-duty vehicles. As a result of these regulations, greenhouse gas emissions from new passenger vehicles, light trucks and heavy-duty vehicles are steadily declining. For example, 2025 model year passenger vehicles and light trucks will emit about half as many greenhouse gases as 2008 models.

Canada is continuing to develop and implement measures to reduce emissions from other key greenhouse gas sources. For example, in December 2014 the Government of Canada announced our intent to regulate hydrofluorocarbons (HFCs), the fastest growing greenhouse gases globally. Canada intends to develop regulations to address methane emissions from the oil and gas sector, as well as greenhouse gas emissions from natural gas fired electricity, chemicals and nitrogen fertilizers through our responsible sector-by-sector regulatory approach that ensures Canada's economic competitiveness is protected. Canada will continue to take cooperative action with our continental trading partners, particularly the United States, and will work towards further action in integrated sectors of the economy, including energy and transportation.

Canada's regulatory approach is coupled with significant investments in clean energy technologies in order to drive a steady transition to a low carbon economy. Since 2006, the Government of Canada has invested more than \$10 billion in green infrastructure, energy efficiency, clean energy technologies, cleaner fuels and smarter grids. Examples include:

- Investments towards the development and demonstration of clean technology products such as electrical vehicle charging stations and wind hybrid power plants.
- Investments to encourage the generation of electricity from renewable energy sources such as wind, low-impact hydro, biomass, photovoltaic and geothermal energy.

Canada is a leader in clean energy technologies, and has made multiple investments in such technologies to promote further innovation. Examples include the world's first large scale power sector carbon capture and storage project in Saskatchewan, as well as the first carbon capture and storage project at an oil sands operation. As a result, Canada is making meaningful progress to limit and reduce greenhouse gas emissions in key sectors. For example, emerging technologies and federal regulatory action has limited emissions in the transportation sector, despite growth in vehicle fleets while emissions are falling in the electricity sector due to coal phase out, switching to natural gas and growth in non-emitting generation. To build on this success, Canada will focus climate-related investments in innovative production technologies to continue to drive further improvements in environmental performance in the oil sands and other growing sectors.

In Canada, climate change is a shared responsibility that requires action from all levels of government. Canadian provinces and territories have jurisdictional authorities over the fields of natural resources, energy, and many aspects of the environment. Each has its own legal framework, policies and measures in place to reduce greenhouse gas emissions. The Canadian Council of Ministers of the Environment, a federal/provincial/territorial intergovernmental forum, has agreed that climate change will be on its agenda on an ongoing basis.

Canada believes that every country must do its part to address climate change. Canada will work with international partners to advance collective efforts. Canada's aim is a durable and inclusive global agreement that will put in place a long-term framework for collaborative action. With this contribution Canada is affirming our continued commitment to developing an international

climate change agreement that is fair, effective and includes meaningful and transparent commitments from all major emitters.

Intended Nationally Determined Contribution

Canada intends to achieve an economy-wide target to reduce its greenhouse gas emissions by 30% below 2005 levels by 2030.

Clarifying Information

Base year	2005
End year	2030
Type	Absolute reduction from base-year emissions
Coverage	Economy wide – 100% of Canadian GHG inventory
Gases covered	<ul style="list-style-type: none"> ○ carbon dioxide (CO₂) ○ methane (CH₄) ○ nitrous oxide (N₂O) ○ sulphur hexafluoride (SF₆) ○ perfluorocarbons (PFCs) ○ hydrofluorocarbons (HFCs) ○ nitrogen trifluoride (NF₃)
Sectors	All IPCC sectors
Implementation	<p>The Government of Canada has in place legislative instruments to address climate change. The federal government’s primary statute is the <i>Canadian Environmental Protection Act, 1999</i>, which includes authorities to regulate GHG emissions. Emissions reductions can also be achieved through policy actions.</p> <p>Since 2006, the federal government has taken the following regulatory action under its responsible sector-by-sector regulatory approach:</p> <ul style="list-style-type: none"> • transportation sector regulations establish progressively more stringent GHG emission standards for heavy-duty vehicles (model years 2014-2018) and for passenger automobiles and light trucks (2011-2025) • electricity sector regulations make Canada the first major coal user to ban the construction of traditional coal-fired electricity generating units. These regulations will also lead to the phase-out of existing coal-fired electricity units without carbon capture and storage; • renewable fuels regulations require that gasoline contain an average 5% renewable fuel content and that most diesel fuel contain an average 2% content. <p>The federal government is also taking action to address transportation emissions from the rail, marine, and aviation subsectors.</p> <p>The federal government is currently developing additional regulatory measures that will:</p> <ul style="list-style-type: none"> • establish more stringent standards in the transportation sector for heavy-duty vehicles of post-2018 model years; • gradually phase down HFCs, which will limit potent GHG emissions that are expected to increase substantially in the next 10 to 15 years; • reduce GHG emissions from natural gas-fired electricity, as well as from chemicals and nitrogen fertilizers; • reduce methane emissions from the oil and gas sector. <p>Canada’s regulatory approach is aligned with that of the United States, where appropriate, recognizing the importance of cooperative action in an integrated North American marketplace. Canada will continue take</p>

	<p>cooperative action with its continental trading partners, particularly the United States, and will work towards further action in integrated sectors of the economy, including energy and transportation.</p> <p>Canadian provinces and territories have significant authorities over the fields of natural resources, energy, and the environment. Each has its own legal framework and each has its own policies and measures that will reduce greenhouse gas emissions. Mechanisms exist for the federal government to engage with Canadian provinces and territories, as well as other key partners and stakeholders, on climate change. In particular, the Canadian Council of Ministers of the Environment, a minister-led intergovernmental forum, will be addressing climate change on an ongoing basis.</p>
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Key assumptions

Metric applied	100-year Global Warming Potential values from the IPCC Fourth Assessment Report
Methodologies for estimating emissions	IPCC Guidelines 2006
Approach to accounting for agriculture, forestry, and other land uses	Canada intends to account for the land sector using a net-net approach, and to use a “production approach” to account for harvested wood products. Canada will exclude emissions from natural disturbances.
Contribution of international mechanisms	Canada may use international mechanisms to achieve its 2030 target, subject to robust systems that deliver real and verified emissions reductions.



Central African Republic

Unity - Dignity - Work

INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

September 2015

Summary

National vision	To become, between now and 2030, an emerging country built upon an economy that is diversified, sustainable and uniformly shared throughout the national territory, a modern state open to the world and committed to an ethic and to technological innovation.
Methodology	<p>Review of the literature</p> <p>Consultation of the stakeholders</p> <p>IGES tool: Tier 1 Method (manual inventory of GHG 1996, revised version and 2006)</p> <p>Reference year: 2010</p> <p>Reference data: Second National Communication of 2013</p> <p>Assumptions: Economic rate of growth: 5-10%; demographic rate of growth: 2.5%</p>
Areas of application and coverage of the contributions	<p>Geographic scope: The national territory</p> <p>Included sectors: Land use, land use change and forestry (LULUCF) (89.46%); energy (5.19%); agriculture (5.26%); waste (0.09%) and industrial processes and use of solvents (2010 data).</p> <p>Included GHG: Carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), representing more than 75% of the national anthropogenic emissions.</p>
Emissions for the reference year	<ul style="list-style-type: none"> ➤ Emission 116,285.49 kt eq-CO₂ ➤ Sequestration 330,000 kt eq-CO₂
Type of contribution	Contributions focussed on sustainable, low-carbon development using an approach combining conditional and unconditional activities: "Action-Results".
Level of contribution	Reduce emissions by 5% compared to the BaU reference level (i.e. 5,498.3 kt eq-CO ₂ of avoided emissions) at the 2030 horizon and 25% (i.e. 33,076.1 kt eq-CO ₂) at the 2050 horizon, within the framework of conditional implementation
Adaptation	<p>Objectives: Agriculture¹ and food security, health, basic infrastructure and sustainable management of natural resources, with the aim of maintaining an annual rate of growth of agricultural activities of 6% and stabilisation of the rate of food insecurity at 15%.</p> <p>Vulnerability profile: Extreme hazards (torrential rains, floods and drought), most vulnerable areas (south, north and northeast) and most vulnerable populations (women, children, indigenous peoples and the aged, i.e. around 75%).</p> <p>Sectors of priority activities: Agriculture and food security, forestry, energy, public health, water resources and land-use planning.</p> <p>Adaptation options: Adjustment of the policy framework, improved knowledge of resilience to climate change, sustainable management of the agricultural, forestry and animal husbandry systems, land-use</p>

¹ Agriculture in the broad sense, including the sub-sectors of animal husbandry, fishing, forestry and other sub-sectors associated with the management of renewable natural resources.

	<p>planning, improvement and development of basic infrastructures, guarantee of energy security, improvement of public health systems, improvement of waste management and sustainable management of water resources.</p>
<p>Financing needs over the period of commitment</p>	<p>Mitigation: US \$2.248 billion over the period of commitment, US \$2.022 billion of which is conditional. A contribution of 10% is envisaged, representing the national counterpart of the projects.</p> <p>Adaptation: US \$1.554 billion over the period of commitment, US \$1.441 of which is conditional. A contribution of 10% is envisaged, representing the national counterpart for the projects.</p>
<p>Ambitious and fair character</p>	<ul style="list-style-type: none"> ➤ A double approach (results and actions) optimising the Central African Republic's approach to the objective of limiting the increase in the global temperature to 2°C. ➤ The Central African Republic is among the poorest countries in the world (lowest GDP/person in 2013 according to the IMF) and as a non-Annex I Party to the UNFCCC, does not have a mitigation obligation. Nevertheless, the Central African Republic intends to participate in the efforts of the international community and thus set an example. ➤ Its emissions were 116 MtCO_{2e} in 2010 and thus represented less than 0.002% of world emissions, or 26 tons eq-CO₂/capita. ➤ Despite the need to vigorously develop its economy, the Central African Republic wishes to limit its emissions per inhabitant to 20 tons eq-CO₂ in 2030 and 12 tons eq-CO₂ in 2050.
<p>Implementation procedure</p>	<ul style="list-style-type: none"> ➤ Adjustment of national development strategies and policies to include climate change ➤ Improvement of the legislative and regulatory framework ➤ Capacity building at all levels ➤ Transfer of technology, cooperation-research: climatology and meteorology, agriculture and agroecology, energy, land use change and forestry, industrial wastes and processes and use of solvents. ➤ Establishment of an appropriate national monitoring, reporting and verification (MRV) system.

INTRODUCTION

The Central African Republic is a landlocked African country with an area of around 623,000 km². The terrain consists of a vast peneplain dominated by two mountain ranges at its eastern and western ends joined by a central spine that separates the two principal drainages, the Chari-Longue basin in the north and the Congo basin in the south.

The climate is hot and humid equatorial, characterised by two seasons: a dry season and a rainy season. The rainfall varies between 800 mm in the north and 1600 mm in the south and the average annual temperature varies between 15 °C in the south and 38 °C in the north. The future scenario indicates an increase in temperature on the order of 1.4 to 2.2°C, assuming low greenhouse gas emissions, and 1.8 to 2.7°C, assuming high greenhouse gas emissions. The forecasts regarding change in precipitation are less clear. Some forecasts predict a slight increase in annual precipitation, while others project irregular variations in precipitation. The extreme climate hazards, the probability of which could increase with climate change, are torrential rains followed by floods and droughts.

From south to north, the biological diversity is composed of five large phytogeographic zones, each with a specific fauna: the *Guinean forest zone* of dense humid forests; the *Sudano-Ubangian zone*, sheltering dense semi-humid, open and dry forests; the *Sudano-Guinean* and *Sudano-Sahelian zones*, composed of various types of savannahs; and the *Sahelian zone*, consisting of steppes.

The population of the Central African Republic is estimated at 5 million, with a demographic growth on the order of 2.5%/year. It is predominantly rural (62.1%), female (50.2%) and young (49.4% less than 18 years of age). The country is sparsely and unevenly populated. The average population density is 7.2 inhabitants per Km². Decades of military and political crises have destroyed the nascent development and the last conflict of 2012-2013 spread insecurity throughout the population, destroyed the productive fabric and dismantled the administrative machinery.

The Central African Republic is among the poorest countries on the planet, with a human development index estimated at 0.341 in 2013. Poverty affects more than half the population, with the corollaries of food insecurity and a lack of basic social services. The Central African economy still relies on a primary agricultural sector with low value added and intensive use of poorly qualified and essentially rural manpower. To the various internal constraints to the country's development, including the low level of industrialisation and the land-locked nature of the country, are added the ongoing changes in the climate, which are reflected in different impacts: slow and gradual changes in the environment, variation in the seasons and on occasions extreme climate events (floods, droughts, tropical storms etc.) that may result in natural disasters.

The annual emissions of the Central African Republic, estimated at 116,285.49 kt eq-CO₂ in 2010, or 26 tons eq-CO₂/person, represent less than 0.002% of global emissions. Despite its low rate of GHG emissions, the Central African Republic reaffirms its adherence to the principle of collective but differentiated responsibility and, in accordance with Decision 1CP/19, is taking the present ambitious measures to respond to this challenge without impeding its economic, social and environmental development.

However, the vulnerability to changes in the climate and a lack of ability to adapt to their adverse impacts represent serious threats to the management of ecosystems and other agricultural and renewable natural resources, social cohesion, stability and sustainable development. Thus, the Central African Republic is obliged to take into account the adaptation of its land, its communities and its socioeconomic activities in this effort to contribute to the mitigation of climate change. The

incorporation of an adaptation component in the INDC is thus a strategic choice that is vital to the country. Moreover, not only do most of the adaptation measures, particularly those that help deal with land use change and reduce the fundamentally non-remunerative nature of agriculture, also contribute to mitigation. However, the adaptation component, which concerns the poorest, most exposed and most vulnerable populations, is an occasion to promote throughout the national territory socioeconomic development on a fair and sustainable basis that can meet the challenges of improving access to the country and preventing inter-regional conflicts.

The Central African Republic's vision is *"to become an emerging country, built upon an economy that is diversified, sustainable and uniformly shared throughout the national territory, a modern state open to the world and committed to an ethic and to technological innovation."* The general objectives of the Central African Republic's INDC are focussed on sustainable, low-carbon development and growing resilience of the sectors of agriculture and food security, health, management of natural resources and infrastructure against the adverse effects of climate change.

The process of developing the INDC is based on a review of the literature, consultation of the stakeholders and the directives for evaluating greenhouse gas emissions of the Intergovernmental Panel on Climate Change (IPCC). At the institutional level, a Technical Group of Multi-Sectoral National Experts responsible for developing the INDC has been established.

Section 1. Mitigation of greenhouse gas emissions

General objectives

The Central African Republic aspires to reduce its emissions by 5% and 25%, respectively, in the 2030 and 2050 horizons in comparison to its reference BaU emissions and to increase its sequestration potential. With international support, it will emit around 33,076.1 kt eq-CO₂ less in 2050 than the annual reference emissions.

The Central African Republic also aspires to reduce emissions of short-lived climate pollutants (SLCP), which science has shown have a significant short-term climate-warming potential and harmful effects on health, agriculture and ecosystems.

Reference data

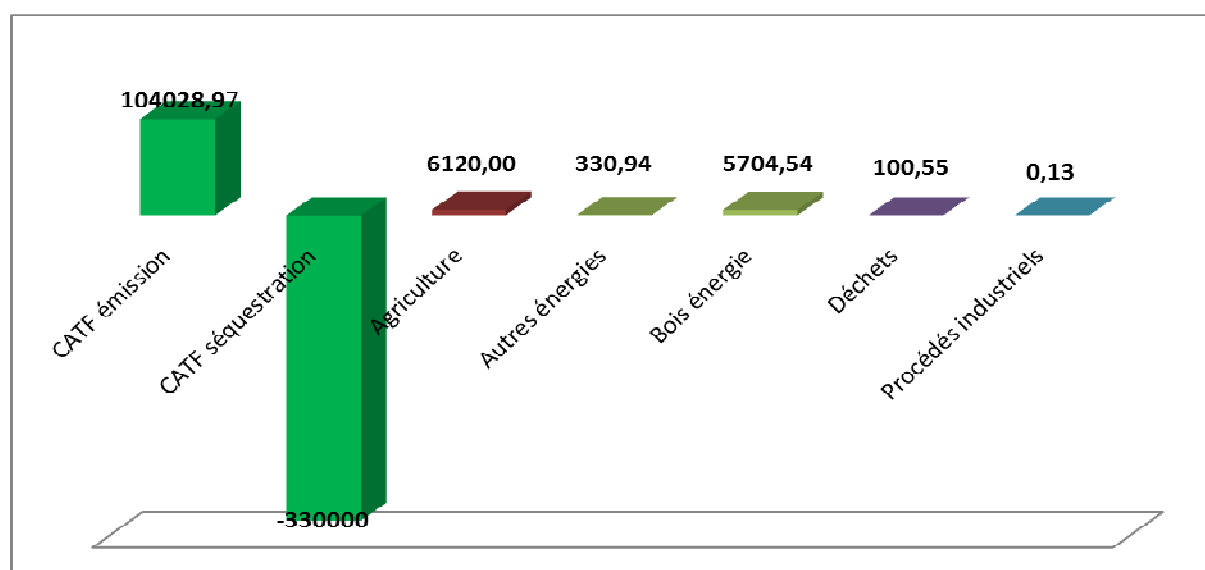


Figure 1: Inventory of greenhouse gases in 2010 (Ministry of Environment, Ecology and Sustainable Development, 2013)

Key (left to right): INDC emissions; INDC sequestration; Agriculture; Other energy; Wood energy; Waste; Industrial processes

The reference data show the inventory of greenhouse gases in 2010 as published in the Second Communication of the Central African Republic. Greenhouse gas emissions total 116,285.49 kt eq-CO₂ with sectoral contributions of 89.46% for land use change and forestry; 5.26% for agriculture; 5.19% for energy (of which 4.91% is wood energy); 0.09% for waste and marginal amounts for industrial processes and use of solvents. In addition, the sequestration potential is evaluated at 330,000 kt eq-CO₂, 62% for land abandoned after use and 38% for biomass.

Reference scenario

The assumptions of the reference scenario are based on:

- The success of the Emergency Programme for Sustainable Recovery (PURD), the principle objectives of which are return to constitutional order, consolidation of the peace and security, as well as restructuring of public finances and the primary sector.
- The resumption of sustained economic growth for the diversification and intensification of economic activities, including increase of the energy supply and updating of the

National Agricultural Investment and Food Security and Nutrition Programme (PNIASAN) and the National Industrialisation Programme.

- Development of individual, institutional and systemic capacities.

In 2050, the Central African Republic will emit around 189,271.8 ± 94,635.4 kt eq-CO₂, i.e. 62.7% more than in 2010, with sectoral contributions of 68.4% for land use change and forestry; 13.4% for energy (10.7% of which is for wood energy); 13.4% for agriculture; 3.2% for water; and finally 1.6% for industrial processes and use of solvents.

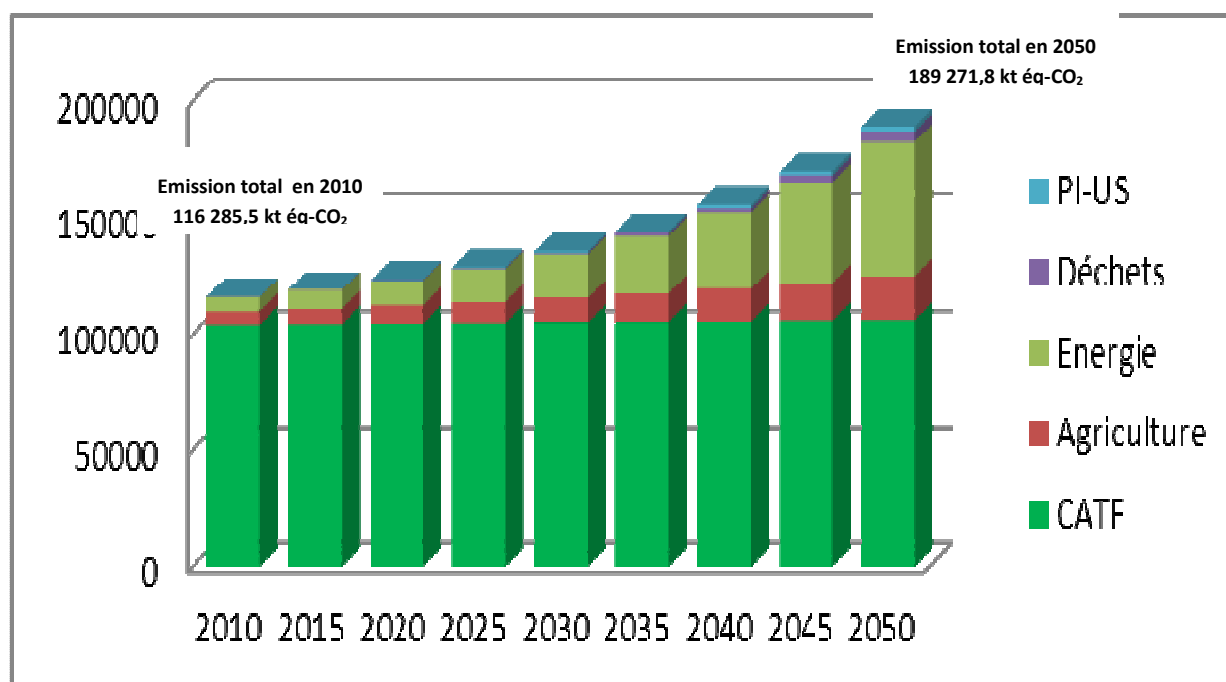


Figure 2: Change in greenhouse gas emissions in the Central African Republic (kt eqCO₂)

Key: Light blue: Industrial processes-use of solvents (IP-US); Purple: Waste; Olive: Energy; Orange: Agriculture; Green: Land use change and forestry (LUCF)

Taking into consideration the net rate of deforestation, which is 0.155% (EDF 2013), the country's potential for sequestration will be 310,146.43 ± 155,073.22² kt eq-CO₂ in 2050, while it was 330,000 kt eq-CO₂ in 2010, a reduction of 6.02%.

However, it should be noted that the Central African Republic's climate forecasts, which show an increase in rainfall and insolation, are favourable for the appearance of forest re-growth throughout the country. This phenomenon will increase the sequestration capacity of the forests.

Greenhouse gas mitigation measures

The national contributions consist of::

- **Unconditional measures** within the ongoing national initiatives, namely the development of industrial forestry sites and the national reforestation initiated since 1980, the outreach programme to gradually abandon slash-and-burn agriculture and burning of agricultural waste and the promotion of low-energy light bulbs initiated by the national power company Energie Centrafricaine (ENERCA) within the framework of the energy conservation policy, and the promotion of improved cook stoves.

² Uncertainties that are foreseen in the quality of the data on the activities of the land use change and forestry sector and the use of emission factors conform by default to the 2006 IPCC guidelines.

- **Conditional measures**, which will be implemented thanks to international support in the sectors of land use change and forestry (LUCF), energy, agriculture, industrial processes and waste (table 1).

Table 1 : Conditional mitigation measures

Description of Project	Emissions avoided (Kt CO ₂ /year avoided)	
	Sectors impacted	Quantities avoided
National programme for advanced conversion of wood	LUCF/Energy	500
National programme for reforestation and rehabilitation of post-exploitation areas	Energy/Agriculture/LUCF	1000
Construction of a photovoltaic solar power plant at Bangui	Energy/IP-US	250
Development of 180 MW Dimoli hydroelectric plant (integration project)	Energy/IP-US	≥ 1500 /country
Development of 72 MW Lobaye hydroelectric plant	Energy/IP-US	≥ 1500 /country
Development of 60 KW La Kotto hydroelectric plant	Energy/IP-US	1000
Development of Mobaye hydroelectric plant (integration project)	Energy/IP-US	250
National Rural Electrification Programme	Energy	250
Construction of a sluice dam along the Ubangi at Zinga	Energy/LUCF	2500
Improved cook stoves programme	Energy/LUCF/Waste	500
National Biofuels Programme	Energy/LUCF/Agriculture Waste	250
Programme for the reduction of short-lived climate pollutants	Energy/Waste/ Transportation/ Agriculture/Health/IP-US	250
Promotion of energy saving light bulbs	Energy/IP-US	10

The implementation of the unconditional mitigation measures will make it possible to reduce greenhouse gas emission by 4,062 kt eq-CO₂ and 10,410 kt eq-CO₂, respectively, in 2030 and 2050. With the support of the international community, the Central African Republic will reduce 5,500 kt eq-CO₂ and 47,320 kt eq-CO₂, respectively, in 2030 and 2050.

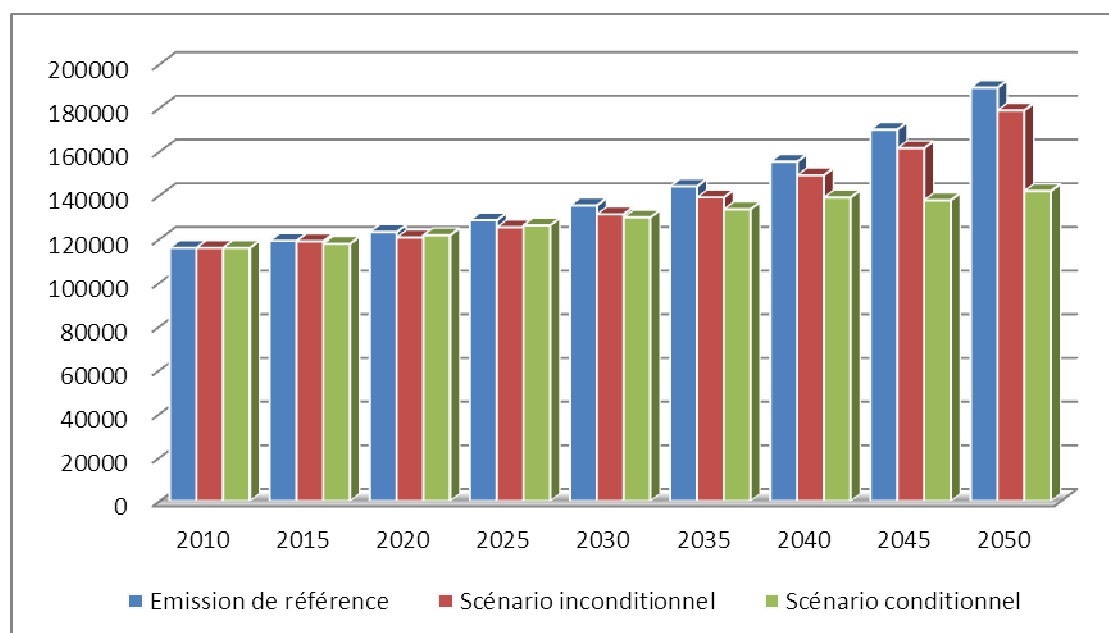


Figure 3: Expected changes in greenhouse gas emissions

Section 2. Adaptation to the adverse effects of climate change

The Central African Republic is at the same time in a post-conflict situation and in political transition, which exposes it to a considerable level of socioeconomic vulnerability. Moreover, the entire national territory is exposed to extreme climate hazards represented by drought and torrential rains followed by floods. The torrential rains and floods affect principally the southern part of the country, while drought is more present in the north and northeast. The rural populations that are the poorest are the ones that are most exposed. Thus, climate changes affect 75% of the Central African population.

In this regard, the INDC, by enhancing resilience to climate change in the key sectors, an essential element of sustainable development, can contribute to national cohesion, stabilisation of the country, restoration of authority and of government actions. In addition, it will facilitate a programmatic approach to increasing the adaptation capabilities of communities, ecosystems and the activity sectors of agriculture, animal husbandry, forests, health and other sectors vulnerable to the adverse impacts of climate change.

Adaptation options and objectives

Eight adaptation options have been identified from the 27 objectives derived from the national priorities. Five ongoing initiatives that enjoy the support of international development partners and 15 prospective adaptation measures are presented below as preconditions for developing a National Adaptation Plan that defines a group of measures to be taken at various decision-making levels (region, prefecture etc.).

Adaptation option 1: Adjustment of the policy framework

Objective 1. Integrate climate change adaptation measures into the policies and programmes for the development of the most vulnerable priority sectors³;

Objective 2. Improve awareness, education and communication regarding adaptation and the risks associated with climate change.

Adaptation option 2: Improve knowledge about resilience to climate change

Objective 3. Enhance capabilities for handling climate change data at the national, regional and local levels.

Objective 4. Study the resilience mechanisms of the agricultural, forestry and animal husbandry systems.

Objective 5. Establish an early warning system.

³ The priority sectors that are most vulnerable to climate change in the Central African Republic are agriculture (including animal husbandry, fishing and forests), food security, health, basic infrastructure and sustainable management of natural resources.

Adaptation option 3: Sustainable management of the agricultural, forestry and animal husbandry systems

Objective 6. Introduce varieties that are adapted to climate extremes

Objective 7. Diversify agricultural systems by including several types of crops and diversifying varieties.

Objective 8. Diversify means of livelihood and systems of production (fishing, aquaculture, agriculture, animal husbandry, hunting and forests).

Objective 9. Establish a seed bank (animal and plant).

Objective 10. Promote agricultural and forestry systems and sustainable soil management.

Objective 11. Promote urban, suburban and community forestry.

Objective 12. Restore degraded forest landscapes.

Objective 13. Sustainably manage transhumance corridors and conflicts between agriculturalists and pastoralists.

Adaptation option 4: Land-use planning

Objective 14. Establish land-use plans by type of use (road infrastructure, mines/petroleum, agriculture, animal husbandry, forests, protected areas or wildlife reserves, urban spaces etc.).

Adaptation option 5: Improvement and development of basic infrastructure

Objective 15. Improve the standards for infrastructure construction.

Objective 16. Develop structures adapted to climate change.

Adaptation option 6: Guarantee energy security

Objective 17. Diversity energy sources.

Objective 18. Develop hydroelectric installations (including micro-dams).

Objective 19. Promote the use of wood waste as fuel for forestry companies.

Objective 20. Promote the use of improved cook stoves.

Adaptation option 7: Improve public health systems

Objective 21. Develop a system for monitoring, preventing and effectively responding to the human diseases associated with climate change.

Objective 22. Establish a waste management plan.

Objective 23. Develop waste management units.

Objective 24. Find uses for wastes.

Adaptation option 8: Sustainable management of water resources

Objective 25. Improve the supply of potable water.

Objective 26. Establish a system for monitoring water quality.

Objective 27. Develop a system for monitoring underground and surface water resources.

Adaptation measures

Ongoing adaptation measures

- Resilience and food security project in the city of Bangui and its Ombella-Mpoko suburbs.
- Southwest Region Development Project (PDRSO).
- Enhancement of agroecological systems in the Lake Chad basin (PRESIBALT/ PRODEBALT).
- Sustainable management of fauna and bush meat in central Africa (GCP/RAF/455/GFF).

Prospective adaptation measures

- Programme to integrate climate change into development plans and strategies.
- Development of a National Climate Change Adaptation Plan.
- Evaluation of needs and development of a national strategy in the area of technology transfer.
- Prepare eligibility for the Green Climate Fund.
- National early warning programme.
- Flood management programme in the Central African Republic.
- Ubangi riverbank development project.
- Drought management programme in the Central African Republic.
- National investment programme for agriculture, food security and resilience to climate change.
- National transhumance management programme.
- Multi-landscape management of biodiversity resources through non-ligneous forest products.
- Promotion of urban and suburban forestry in the large cities of the Central African Republic.
- Implementation and monitoring of forest management plans.
- Enhancing climatic resilience and the transition to low carbon emission development in the Central African Republic through sustainable management of forests by means of better land-use planning.
- Prevention of waterborne diseases and other seasonal pathologies.
- Planning of drinking water supply systems in the Central African Republic.

Probability of co-benefits of adaptation and mitigation measures

We note that all the measures relating to the agriculture and forestry sector can generate mitigation co-benefits. For example, the objective of the National Programme for Investment in Agriculture, Food Security and Nutrition (PNIASAN) is to attain and maintain an annual agricultural GDP rate of 6% and a food insecurity rate of 15%. It envisages the mobilisation of 70% of the population to initially enhance 661,826 ha of land, with a planned expansion of 28.6%, reaching 851,750 ha in five years. The inclusion of climate-sensitive agroecological approaches (smart agriculture) in the PNIASAN with a view to increasing productivity and yield may make it possible to keep each farmer on the same original parcel of land for five years, which will make it possible to minimise or complete avoid increases in area and thus capitalise the deforestation (28%) avoided over the four years following the start-up of the project. To do this, it is necessary to revise the PNIASAN and consequently increase its budget through the contribution of the expected conditional funds, particularly from the Green Climate Fund.

Section 3. Implementation

The Central African Republic envisages a holistic approach, integrating adjustment of national policies and strategies, improvement of the legislative and regulatory frameworks, and capacity development and transfer of technology in certain priority areas.

Need for technology transfer and capacity development

The target sectors and technologies are summarised in the following table:

Table 3 : Target areas and technologies

Sectors	Target technologies
Energy	<ul style="list-style-type: none"> – Hydroelectric micro-dams – Solar heat and solar photovoltaic energy – Methanisation processes for organic matter – Improved carbonisation
Industrial processes and use of solvents	<ul style="list-style-type: none"> – Particle and gas sensors
Agriculture and animal husbandry	<ul style="list-style-type: none"> – Soil analysis – Production, inspection and certification of high quality seeds – Integrated management of plant diseases – Monitoring prevention and control of animal diseases of a trans-national character impacting human health and ecosystems. – Agroecology
Land Use Change and Forestry	<ul style="list-style-type: none"> – Advanced conversion of wood – Land and forestry monitoring system
Waste	<ul style="list-style-type: none"> – Waste recycling – Treatment of industrial effluents – Waste reclamation
System observatory	<ul style="list-style-type: none"> – Climatological and meteorological observation system – Research

Technology transfer will include a capacity development programme to be adopted at various levels, both institutional and local.

Need for financing

The needed financing totals US \$3.802 billion over the commitment period, i.e. US \$2.248 billion to implement the mitigation measures and US \$1.554 billion for the development of resilience to climate change.

Underestimation of the cost of investments needed for adaptation may keep in place the development gap caused by climate hazards. The approach taken by the FUND model, which will be supported by the preparatory work of the National Adaptation Plan, estimates the country's needs for adaptation to climate change at an average of around US \$34,500,000 per year up to 2030 and an average of US \$57,500,000 per year up to the year 2050.

Moreover, the Central African Republic, a non-Annex 1 country, supports the inclusion of international market instruments, such as the Clean Development Mechanism, in a post-2020 climate agreement. Such an instrument may be used to help finance certain investments in low-carbon infrastructure that is resilient to climate change.

The Central African Republic considers that certain low-carbon development options and supplementary actions could be entirely or partially financed by the international transfer of carbon assets, taking into consideration environmental integrity and transparency factors.

It is important to provide resources for the studies leading up to the mitigation, adaptation and technology transfer activities.

Table: Financial resources for implementation

A. ADAPTATION			
Sectors	Unconditional	Conditional	Studies for conditional measures
	US \$	US \$	US \$
Ongoing adaptation measures			
Resilience and food security project in the city of Bangui and its Ombella-Mpoko suburbs			
PREVES			
Southwest Region Development Project (PDRSO)			
Enhancement of agroecological systems in the Lake Chad basin (PRESIBALT/ PRODEBALT)			
Sustainable management of fauna and bush meat in central Africa (GCP/RAF/455/GFF)			
Prospective adaptation measures			
Programme to integrate climate change into development plans and strategies	40,200	335,000	33,500
Development of a National Climate Change Adaptation Plan	72,000	600,000 ,	60,000
Evaluation of needs and development of a national strategy in the area of technology transfer	60,000	500,000	50,000
Enhancement of climate resilience and transition toward low carbon emission development in the Central African Republic and the Republic of the Congo through sustainable management of forests by means of better land use planning.		6,500,000	
Preparation of eligibility for the Green Climate Fund	24,000	200,000	20,000
Flood management programme in the Central African Republic		80,000,000	8,000,000
Ubangi riverbank development project		15,000,000	1,500,000
Drought management programme in the Central African Republic		80,000,000	8,000,000
National early warning programme		40,000,000	4,000,000
National investment programme for agriculture, food security and resilience to climate change		350,000,000	35,000,000
National transhumance management programme		100,000,000	10,000,000
Programme of multi-landscape management of biodiversity resources and monitoring of forest management plans		106,500,000	10,650,000
Promotion of urban and suburban forestry in the large cities of the Central African Republic		8,000,000	800,000
Implementation of the management plan and business plan of the Mbaéré-Bodingué National Park		20,500,000	2,050,000
Prevention of waterborne diseases and other seasonal pathologies		5,000,000	500,000
Planning of drinking water supply systems in the Central African Republic		600,000,000	60,000,000
SUBTOTAL	196,200	1,413,135,000	140,663,500

GRAND TOTAL - ADAPTATION			1,553,994,700
B. MITIGATION	Unconditional measures	Conditional measures	Studies for conditional measures
	US \$	US \$	US \$
National programme for the advanced conversion of wood		12,500,000	1,250,000
National programme for reforestation and rehabilitation of post-exploitation areas	20,750,000	37,500,000	3,750,000
Construction of a photovoltaic solar power plant at Bangui		100,000,000	10,000,000
Awareness programme for the cessation of slash-and-burn agriculture	2,500,000		0
Promotion of energy saving light bulbs		1,000,000	100,000
180 MW Dimoli hydroelectric development (integration project)		250,000,000	25,000,000
72 MW Lobaye hydroelectric development		162,500,000	16,250,000
60 MW La Kotto hydroelectric development		453,750,000	45,375,000
Mobaye hydroelectric development (integration project)		50,000,000	5,000,000
National Rural Electrification Programme		400,000,000	40,000,000
Construction of a sluice dam along the Ubangi at Zinga		500,000,000	50,000,000
Improved cook stoves programme		5,000,000	500,000
National biofuels programme		25,000,000	2,500,000
Programme for the reduction of short-lived climate pollutants		25,000,000	2,500,000
Subtotal	23,250,000	2,022,250,000	202,225,000
GRAND TOTAL - MITIGATION			2,247,725,000

Obstacles to be overcome

For the financial effort expected from the Central African Republic's international partners to be fully effective, the funds must be effectively used. Moreover, the following difficulties also have to be surmounted:

- **Military and political crises: for the past several decades these have contributed to weakening of all of the country's institutions, political instability, insecurity and extreme poverty.** The ongoing programme to develop social cohesion and bring the country together should make it possible to stabilise the situation.
- **The lack of synergy between sectoral policies and institutions: this leads to jurisdictional conflicts and underperformance and affects the efficiency of the government. It can delay the achievement of the INDC's objectives.** The ongoing improvement in inter-ministerial coordination should respond to this concern.
- **The illiteracy rate (estimated at 67% in 2008): this limits access to information and to opportunities, the acquisition of skills and, as a consequence, the level of the citizen's contribution to carrying out public policies and meeting the government's**

international commitments. Educational programmes are ongoing and basic literacy should be improved.

- **The absence of interregional socioeconomic equality leads to frustration and social tensions.** The government will implement a decentralisation programme that will permit decentralised entities to play a full role.
- **The government's insufficient capacity for investment does not permit it to cover by itself the costs of implementing the INDC.** The actions and support of the development partners and the improvement of the business climate are necessary to carry out the Central African Republic's INDC.
- **Poor ability to absorb funds and deal with the lenders' procedures will affect the smooth implementation of the programmes.** The enhancement of individual and institutional capabilities will improve the effectiveness and efficiency of the programmes.
- **Extreme poverty: when joined to the other factors listed above, this has been a breeding ground for violence for several decades.** The implementation of the antipoverty strategy is a specific priority for significantly reducing extreme poverty.

Monitoring and notification of progress

The Central African Republic's INDC is a development policy with low carbon emissions and low emissions of short-lived climate pollutants. In this regard, the Central African Republic will put in place an appropriate national measurement, notification and verification system. Moreover, the government will organise regular consultations with the stakeholders at the national, regional and local level to both update the actions and make sure that they are carried out.

REPUBLIC OF CHAD



UNITY – WORK – PROGRESS

Intended Nationally Determined Contribution (INDC) for the Republic of Chad

September 2015

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Abréviations et acronymes utilisés

ADB	Asian Development Bank
ADF	African Development Fund
AGIR-PRP	Alliance Globale pour l'Initiative Résilience-Priorités Résilience Pays (Global Alliance for Resilience Initiative)
ASAP	Adaptation for Smallholder Agriculture Programme
BaU	Business as Usual
CDM	Clean Development Mechanism
CH4	Methane
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
ECCAS	Economic Community of Central African States
EVI	Economic Vulnerability Index
EU	European Union
FAOSTAT	Statistic software of the Food and Agriculture Organization
FCFA	Franc Communauté Financière Afrique
FSE	Fonds Spécial pour l'Environnement (Special Fund for the Environment)
GDP	Gross Domestic Product
GEF	Global Environment Facility
Gg	Gigagramme
GHG	GreenHouse Gas
GTR	Groupe de Travail Restreint (Core Working Group)
GWh	GigaWatt hour
GWP	Global Warming Potential
IDB	Islamic Development Bank
IFAD	International Fund for Agricultural Development
INSEED	Institut National de la Statistique et des Etudes Economiques et Démographiques (National Institute of Statistics for Economic and Demographic Studies)
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated Water Resources Management
LDC	Least Developed Countries
MRV	Measurement, Reporting and Verification system
NAPA	National Adaptation Programme of Action
N2O	Nitrous Oxide
P2RS	Nutrition and food insecurity resilience reinforcement programme in the Sahel
PAIBLT	Projet d'Appui à l'Initiative du Bassin du Lac Tchad
PARSAT	Projet pour Améliorer la Résilience des Systèmes d'Agriculture au Tchad (Project to Improve the Resilience of Agricultural Systems in Chad)
PLCBA	Prévention et Lutte Contre les Bio-Agresseurs (Prevention and fight against bio-aggressors)
PNISR	Plan National d'Investissement pour le Secteur Rural (National Investment Plan for the Rural Sector)
PREDAS	Programme Régional de promotion des Energies Domestiques et Alternatives au Sahel (Regional Programme for the Promotion of Household and Alternative Energies in the Sahel)
PRODEBALT	Programme de Développement Durable du Lac Tchad (Lake Chad basin sustainable development programme)
RPCA	Réseau de Prévention de la Crise Alimentaire (Food Crisis Prevention Network)
PRP	Priorités Résilience Pays (Country Resilience Priorities)
REDD+	Reducing Emissions from Deforestation and Forest Degradation

SCPM	Suivi du Climat et Prévision Météorologique (Climate and meteorological forecast monitoring)
SNE	Société Nationale d'Electricité (National Electricity Company)
STI/HIV/AIDS	Sexually Transmitted Infections /Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
tCO ₂ e	Tonne of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar

Section 1. Summary

<i>Contribution</i>	<ul style="list-style-type: none"> > Contribution based on a mixed approach, (Results and Actions, both conditional and unconditional) > Results-based Approach: percentage of emission reduction by 2030. Data obtained through projections based on the latest GHG inventories presented in the 2nd National Communication, and on the data and national and regional strategy and policy documents > Action-based Approach: relating to the implementation of current policies, awareness of good practice, in particular in the field of agriculture
<i>National Objectives</i>	<ul style="list-style-type: none"> > Chad's vision by 2030: an emerging country with a middle-income economy, generated by diverse and sustainable growth sources and value adding activities
<i>Emissions for the reference year (2010)</i>	<ul style="list-style-type: none"> > 8,379.62Gg CO₂e
<i>Cumulative reduction of emissions for the period 2015- 2030</i>	<ul style="list-style-type: none"> > Unconditional reduction of 18.2% of the country's emissions compared to the reference scenario by 2030, approx. 41,700 Gg CO₂e > Conditional reduction of 71% of the country's emissions by 2030, cumulative reduction of 162,000 Gg CO₂e
<i>Coverage and scope of the contribution</i>	<ul style="list-style-type: none"> > 100% of the country is covered by the stipulated contributions > Energy, Agriculture/Livestock, Land use and forestry, Waste > Gases covered: CO₂, CH₄, and N₂O
<i>Implementation process</i>	<ul style="list-style-type: none"> > Reinforcement of human, institutional and technological capacities, as well as financial support and technology transfers
<i>Assumptions and methodology</i>	<ul style="list-style-type: none"> > IPCC 2006 guidelines for national greenhouse gas inventories. > The reference scenario is established taking into consideration the assumptions stated in the vision and strategy documents in place in Chad
<i>Adaptation</i>	<ul style="list-style-type: none"> > Priority sectors: water, agriculture/agroforestry, livestock and fishing > Priority target zones: Kanem, Barh El Ghazal, Batha, Guéra, Hadjer Lamis, Wadi Fira; Ouaddai, Dar Sila, Lac, Moyen-Chari, Borkou, Tibesti, Ennedi Est, Ennedi Ouest)¹
<i>Funding needs</i>	<ul style="list-style-type: none"> > Adaptation: 14.170 billion USD in total for the period, of which 11.380 will be used to achieve the conditional objective > Mitigation: 7.063 billion USD in total for the period, of which 6.540 will be used to reach the conditional objective > Total implementation cost of the INDC: 21.233 billion USD, of which 17.920 will be used to achieve the conditional objectives
<i>Environmental and fair character</i>	<ul style="list-style-type: none"> > Chad does not have a historical responsibility, although it is already experiencing the impacts of climate change. It is characterised by a structural vulnerability, with an Economic Vulnerability Index (EVI) of 52.8 in 2012, which is greater than that of the majority of less developed countries, which have an average EVI of 45.7 > A dual approach (results and actions) optimising Chad's contribution towards reducing the impacts of climate change on a global scale: Chad aims to halve its emissions per inhabitant, reducing them from 0.736 tCO₂e in 2010 to 0.334 tCO₂e in 2030, under the conditional scenario, whilst using its available resources in a diverse and sustainable manner

¹ NAPA Chad (2009), and working groups "adaptation of workshops, dated 15 June and 24 to the 25 August 2015"

Section 2. National circumstances

Chad, a landlocked sub-Saharan country, lacking a coastline, covers a surface area of 1,284,000 km², the majority of which is desert. The country's main economic activities are those associated with the primary sector, such as subsistence agriculture, livestock rearing and fishing. Despite the oil industry being relative new, with exports only having started in 2004, it is already booming. An oil refinery, which opened in 2011, meets domestic demand for oil products.

Table 1. Key data for 2010 (reference year)

Surface Area	1,284,000 km²
<i>Climate</i>	Three climate zones: Saharan, Sahelian and Sudanian
<i>Population</i>	11,679,974 inhabitants (2 nd National Census, 2009 including refugees), of which 21.9% live in urban areas and 46.4% are of working age. The natural rate of growth is 3.6% per year
<i>GDP</i>	5,249.6 billion FCFA
<i>GDP structure</i>	Oil: 37%; Agriculture: 21%; Trade: 13%; Other sectors: 29%
<i>Rate of access to electricity</i>	3.9%
<i>Proven oil reserves</i>	1.5 billion barrels
<i>Oil production</i>	122,500 barrels/day on average
<i>Rate of access to sanitation facilities</i>	23% in urban areas, 4% in rural areas
<i>Rate of access to drinking water</i>	43% on a national level.

Over the last ten years, Chad's Saharan and Sahelian zones have spread 150 km south. This has resulted in reduced farming and pasture areas, which, in turn, has led livestock rearers and farmers to move to more suitable areas to work, leading, in general, to a reinforcement of existing inequality and discrimination amongst certain populations. Likewise, Lake Chad has reduced in size from 25,000 km² in 1960 to 2,500 km² today. This reduction has considerably impacted upon crop and fish production, and forced inhabitants to move to wetter areas.

With the increase in oil exploitation, exporters of agro-pastoral products have lost ground to oil exporters, with oil representing 88% of exports in 2010, against 6% for livestock, 2% for cotton fibre and 4% for other products.

The state of the National Electricity Company's (SNE), production facilities exclusively thermal, explains the high cost of electricity production, which represents an obstacle to the competitiveness in the Chadian economy, in particular in terms of industrial and commercial activity. The absence of an interconnected national grid makes economical pooling of the energy generated impossible, instead favouring the proliferation of isolated and onerous production facilities to supply the different cities across the country, which makes electricity expensive.

In line with its Government policy guidelines for development, Chad aspires to become an emerging country by 2030. In this regard, the Government intends, amongst other things, to reinforce environmental protection, GHG emissions mitigation measures and adaptation actions in respect of climate change.

The issue of environment protection is enshrined in articles 47 and 52 of the Constitution of Chad, and Act N°014/PR/1998 defines the general principles for protecting the environment. In 1992, Chad signed the United Nations Framework Convention on Climate Change (UNFCCC), which was ratified on 30 April 1993. Since then, the country has produced the Initial and Second National Communications relating to climate change, in accordance with the relevant UNFCCC provisions. This demonstrates Chad's desire to make an effective contribution to the global effort to combat global warming, to which the country is highly vulnerable given the fragility of its ecosystems and its economy, which is highly dependent on sectors that are sensitive to climate change.

In the face of development challenges, Chad is ready to fight against climate change and adapt to its impacts by making efforts to protect the environment, in particular through activities such as planting thousands of trees each year and implementing the national programme for the development of green belts around Chadian cities. In addition to these green belts, ten million trees are being planted as part of the African Great Green Wall initiative, and National Tree Week has been officially launched. Chad has also established a Special Fund for the Environment (FSE) in 2013, in order to mobilise its own resources through the establishment of specific taxes.

Under this INDC, Chad intends to reaffirm its determination to contribute to the global effort to reduce GHG emissions and reinforce its resilience to climate change, implementing coherent programmes which will enable it to become an emerging country by 2030, whilst favouring low-carbon development, as far as possible with the means available. The largest challenge to overcome is the move, between now and 2030, from a development model based on oil revenue, to a model based on a more diversified economy with sustainable utilisation of resources and an energy transition.

Chad supports the Lima summit's call for action on climate change, as cited in the decision 1/CP.20, which called for each Party country to establish a nationally determined contribution in order to achieve the Convention's objective. Chad's contribution is based on measures and results.

Section 3. Adaptation

Impacts and vulnerability

The impacts of climate change are significant on the large hydrographic systems of the basins of Lakes Chad and Niger: natural, agro-silvo-pastoral, fishery and human systems. They include changes to the agricultural seasons, disturbances in the biological cycles of crops and a reduction in cereal crop production. Depending on the geographic zone, climate change exposes certain sectors and social groups to a medium to high level of vulnerability (1 = very high, 6 = lower), according to the NAPA and consultations carried out during the workshop launching the INDC preparation process.

- Saharan Zone
 - Sectors: 1) livestock, 2) agriculture, 3) trade, 4) natural resources, 5) water
 - Groups: 1) The sick, 2) isolated elderly people, 3) women and children, 4) disabled heads of family, 5) displaced persons
- Sahelian Zone
 - Sectors: 1) water resources, 2) agriculture, 3) livestock, 4) fishing, 5) gathering, 6) handicrafts, 8) forestry
 - Groups: 1) women and children, 2) isolated elderly people, 3) the sick, 4) displaced persons and refugees, 5) returning persons
- Sudanian Zone
 - Sectors: 1) water resources, 2) agriculture, 3) livestock, 4) fishing, 5) fishery resources, 6) forestry
 - Groups: 1) women and children, 2) isolated elderly people, 3) displaced persons, 4) refugees, 5) rural populations, 6) returning persons²

National priorities in terms of adaptation to climate change

Whilst the actions are applicable to all of Chad, it appears that the priority target zones (Kanem, Barh El Ghazal, Batha, Guéra, Hadjer Lamis, Wadi Fira; Ouaddai, Dar Sila, Lac, Moyen-Chari, Borkou, Tibesti, Ennedi Est, Ennedi Ouest) are especially vulnerable to the effects of climate change and, in part, to the arrival of displaced populations. There are approx. 700,000 displaced people in Chad, including refugees and Chadians returning from Sudan, the Central African Republic, Nigeria and Libya (OCHA, 2015).

- Cross-cutting priorities:
 - Reinforce the capacities of the stakeholders (farmers, fishermen and livestock rearers) and their revenue-generating activities;
 - Improve production techniques by developing water infrastructure, access to improved and adapted inputs (food crop and fodder seeds, animal gene banks, manure management, compost management, etc.), develop storage and conservation units to limit high post-harvest losses;
 - Inform, educate and communicate information relating to climate risk, (improve the observatory used to forecast meteorological events and develop the population's ability to react in the event of a catastrophe);
 - Create an observatory for policies for adapting to climate change;
 - Improve the seasonal forecast of precipitation and surface runoff;
 - Manage climate risks.
- Priorities by sector (NAPA, 2009 and June 2015 Workshop):
 - Water: manage water through the creation and development of agricultural irrigation structures including retention ponds, irrigated perimeters, artificial lakes, and the application of Integrated Water Resources Management (IWRM) and Water Governance

² A = supplements indicated during working groups "adaptation launch workshop, 15 June 2015"

- **Agriculture:** develop intensive and diverse cultivation, using improved inputs, (organic fertilisers including composts, adapted plant varieties), agroforestry, land and water conservation, (implementation of soil restoration works) and preparation and distribution of new cropping calendars
- **Livestock:** securing pastoralism and transhumance through common grazing zones, as well as creating and popularising fodder banks and crossbreeding of animal species
- **Fish:** development of enclosed fish farming areas

The cost of national priorities, in terms of adaptation to climate change, are met on the one hand by the National Investment Plan for the Rural Sector (PNISR), covering the period 2014 – 2020 and validated in 2014, and on the other by the meeting held by the Food Crisis Prevention Network (RPCA) in March 2015, which put forward the Country Resilience Priorities (PRP) AGIR CHAD for implementation by 2020, which would help approx. 6.5 million people escape food and nutritional insecurity.

The PNISR, using an initial amount of 2,301.7 billion CFA francs for the period 2014-2020, estimate that, by 2030, by applying an annual population growth rate of 3.6% and an annual inflation rate of 2.9%³, this amount will be 4,321 billion CFA francs. The overall cost of the AGIR CHAD PRP will be 775 billion CFA francs for a period of 5 years until 2020. By 2030, the total necessary funding to implement the INDC adaptation component would be 14.170 billion USD, in order to establish development resilient to climate change.

Current and planned initiatives to support adaptation

On the national level, the initiatives to support adaptation have just started within the National Adaptation Programme of Action for Climate Change (NAPA adopted in 2009), in particular with financing by the EU (~5.26 billion CFA francs or 8 million Euros through the AMCC –Global Climate Change Alliance project-) for the following priority projects:

- Development of intensive and diversified crops that are adapted to extreme climate risks
- Soil restoration and defence against degradation caused by climate change
- Improvement of intercommunity grassland areas, in order to reduce migratory movements due to climate change
- National Agency for the Great Green Wall

In addition to these, adaptation will be supported by the 11th European Development Fund for the period 2014-2020. This foresees the provision of 297 million euros for “rural development, nutrition and food safety”, and an amount of 53 million euros for “sustainable management of natural resources”.

Finally, adaptation is supported by the Project to Improve the Resilience of Agricultural Systems in Chad (PARSAT). The PARSAT with total funding of 36.2 million USD, co-funded by IFAD, GEF, ASAP and the Chadian government was put in place in 2015, for a period of 7 years.

At a regional level, there are:

- The Lake Chad basin sustainable development programme (PRODEBALT with funding from ADB)
- The nutrition and food insecurity resilience reinforcement programme in the Sahel (P2RS, based on African Development Funds amounting to 15 million USD)
- The Project in Support of the Lake Chad Basin initiative to reduce vulnerability and the risks associated with STIs/HIV/AIDS (PAIBLT, ADB)
- The regional “Adaptation to climate change in the Lake Chad Basin” project (German Ministry for Economic Development and Cooperation/Federal Enterprise for International Cooperation cooperation) covering the period 2013-2018
- The Lake Chad preservation project: contribution to the Lake development strategy (GEF-ADF)

³ <http://www.afdb.org/fr/countries/central-africa/chad/chad-economic-outlook/>

- Pan-African Great Green Wall agency
- The Programme for integrated management of cross-border basins in African – example: Lake Chad (EU)
- The regional programme to reinforce the resilience of countries in the Sahel (26 million US, IDB)

Gaps and barriers

Gaps:

- Poor understanding of the concept of climate change by the vast majority of society
- Illiteracy
- Lack of involvement from women

Barriers:

- Poor integration of policies relating to climate change into national and sectoral policies
- Besides the Directorate-General of Meteorology and the Directorate leading the Fight Against Climate Change, there is no other climate governance structure
- Poor livelihood capacity, (physical, national, social, institutional, etc.) of communities
- Slow implementation of measures
- Failure to consider climate change in the general State budget
- Insufficient international funding

Summary of adaptation needs

In order to reduce vulnerability and increase resilience, adaptation needs include the reinforcement of human, institutional and technical capacities, as well as financial support and technology transfer.

Needs for reinforcement of human and institutional capacity:

- Inform, educate and communicate information regarding climate risks and adaptation technologies (develop the population's ability to react)
- Reinforce stakeholder attitudes, (in particular in relation to women and farmers), with regards to new techniques in terms of intensive and sustainable methods of production
- Support research and encourage the transfer of technology between research bodies and agro-silvo-pastoral stakeholders
- Support institutions in defining adaptation priorities, for each socio-economic sector, based on the needs of the population and favouring coherence between sectors, in particular during the preparation of the National Adaptation Plan

Technical needs, transfer of technology and financial needs

Table 2. Technical needs, technology transfers and funds⁴

Needs	Objectives and Description
<i>Control and management of water resources</i>	<ul style="list-style-type: none"> > Develop, renovate and manage hydro-agricultural facilities, retention basins and artificial lakes > Adapt arrangements for rain fed and flood-recession crops and livestock watering > Develop small and medium-sized irrigation systems and improve their capacity to limit water consumption > Prepare channels to enable the transportation and supply the perimeter of polders on Lake Chad > Carry out work to create a drinking water supply > Create, renovate and manage water sources according to human needs and protection of the environmental eco-system
<i>Intensification and diversification of agrarian production</i>	<ul style="list-style-type: none"> > Intensify and diversify agrarian production whilst facilitating access to inputs(organic fertilizers, seed for food crops and fodder resistant to drought and certified and approved phytosanitary products) and agrarian equipment > Develop an agro-ecological approach (soil fertility management practices, addition of manure and compost, agroforestry development, water and soil conservation)
<i>Secure migration of livestock and support the combining agriculture and livestock raising</i>	<ul style="list-style-type: none"> > Secure herd mobility, based on traditional transhumance routes and preserve natural resources > Enable the diversification of activities (livestock of multiple animal species, combining of agriculture and livestock, sale of harvest transportation services, fodder crops, etc.) > Encourage genetic diversity of various animals > Support social agreements between the various groups of livestock rearers and farmers in areas of transhumance
<i>Support the use of water resources</i>	<ul style="list-style-type: none"> > Develop use of water resources whilst preserving these Resources, (stocking of water, development of rainfed fish production and implementation of restricted access)
<i>Improve population wellbeing</i>	<ul style="list-style-type: none"> > Improve agricultural production and livestock rearing activities (drainage, dry storage, cold chain) using renewable energy sources (hydroelectricity, solar, wind)
<i>Knowledge of spacio-temporal changes to the environment</i>	<ul style="list-style-type: none"> > Climate and meteorological forecast monitoring (SCPM) > Prevention and fight against bio-aggressors (PLCBA) > Information networks providing access to information on areas hit by disease, as well as those where water and grazing resources are significant > Develop and renovate the hydrometeorology network with a view to improving knowledge of spacio-temporal changes to the environment
<i>Support initiatives</i>	<ul style="list-style-type: none"> > Environmental protection projects to support adaptation

⁴ The costs are included in the table 7 summary.

Section 4. Mitigation

Table 3. Base information relating to mitigation contributions

		Discounted reduction rate
Type of contribution	Unconditional contribution	> Reduction of 18.2% of GHG emissions in comparison with reference scenario (BaU) by 2030
	Conditional contribution	> Reduction of 71% of GHG emissions, between 2016 and 2030 in comparison with reference scenario
Reference year		> 2010
Target year		> 2030
Cumulative reduction of emissions by 2030		> 41,700 GgCO ₂ e for the unconditional objective and 162,000 GgCO ₂ e for the conditional objective

Reference scenario and emission reduction objectives

The table below shows the emissions from the reference year and the reference scenario (BaU), emissions for the unconditional objective as well as emissions for the conditional objective, the implementation of which will be dependent on the financial support received from the international community.

Table 4. Emissions for the reference scenario and mitigation objectives

Sector		Emissions (Gg CO ₂ e)			
		2010 Survey	Reference scenario 2030	Unconditional	Conditional
1	Energy	665.20	2,165.00	2,165.00	1,840.25
2	Agriculture and Livestock	18,448.00	43,426.00	38,215.70	30,398.83
3	Land use and forestry	(-) 10,908.77	(-) 17,387.48	(-) 17,387.48	(-) 24,342.48
4	Waste	175.19	455.85	455.85	402.85
Total		8,379.62	28,659.37	23,449.07	8,229.45
% reduction				18.20	71.00

Mitigation objectives by 2030

Figure 1 Emissions of the reference scenario and mitigation objectives

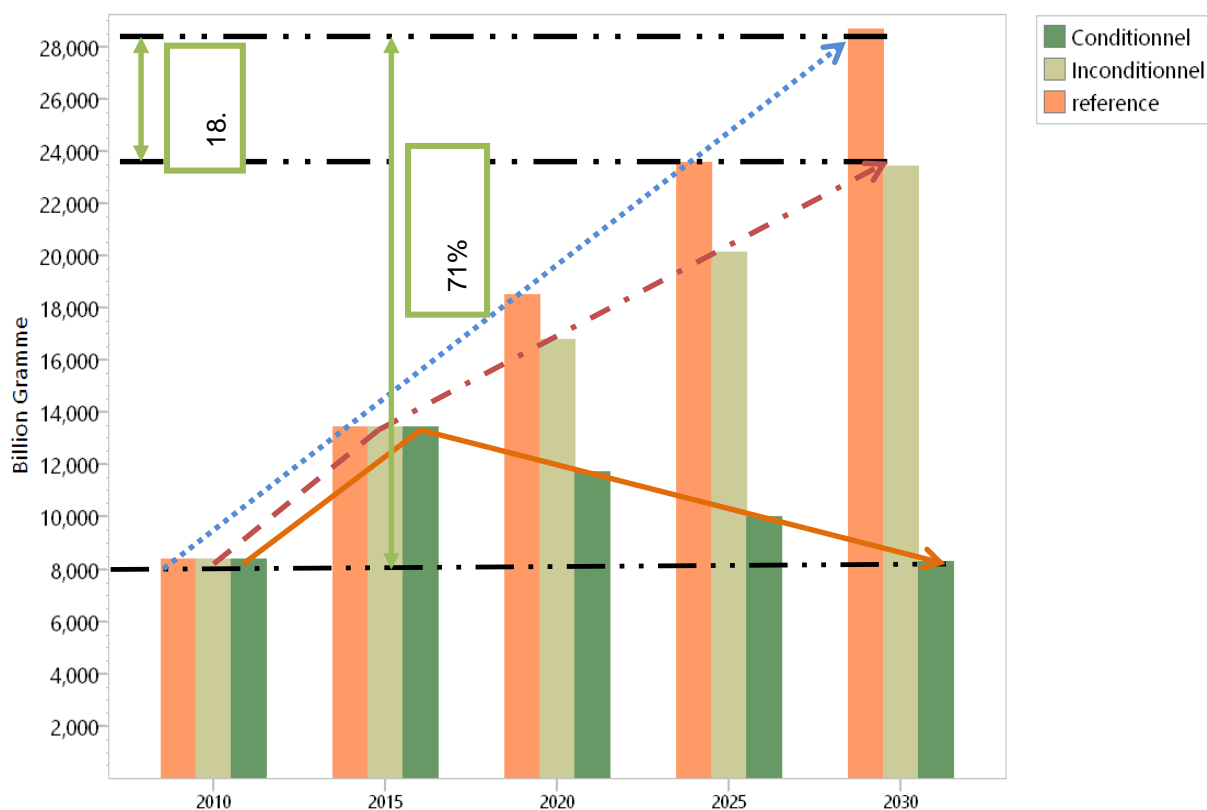


Table 5. Scope and field of contributions

Sector	Gas	Sub-sectors	Geographic scope
Energy	CO ₂ , CH ₄ , N ₂ O	Fuel combustion activities, fugitive emissions from fuels.	National
Agriculture/Livestock	CH ₄ and N ₂ O	Enteric fermentation, manure management, rice cultivation, agricultural soil, controlled burning of the savannah, burning of agricultural waste.	National
Land use and forestry	CO ₂	Forest lands, cultivated land, grassland.	National
Waste	CH ₄ , N ₂ O	Elimination of solid waste, Treatment of used water.	National

Assumptions and methodology

Methodology

The accounting method for GHG inventory in each sector is the same as that used in the IPCC 2006 Guidelines on national GHG inventories. The values used, with regards to the Global Warming Potential (GWP) for the different greenhouse gases, are those published in Appendix 3 of Decision 24, adopted by the Conference of the Parties during their 19th meeting between the 11th and 23rd November 2013. Energy demand projections for 2030 are based on the Blueprint for Chad's energy sector. For the waste sector, the projections reflect the demographic and migratory forecasts published by the National Institute of Statistics for Economic and Demographic Studies (INSEED). In the calculations of GHG gases for the agriculture, livestock, land use and forestry sectors, in the absence of national data, the values published by the statistical division of the Food and Agriculture Organization of the United Nations (FAOSTAT) are used. The reference scenario was built considering the assumptions cited in the vision and strategy documents in place in Chad, in particular:

- "Vision 2030, The Chad we want"
- ECCAS 2025 strategic vision on the environment
- ECCAS General Environment and Natural Resources Management Policy
- Order No. 89 PR/PM/MAE/SG/DGE/2015 relating to the establishment of a Core Working Group (GTR) responsible for preparing Chad for the COP 21
- Chad Energy Sector Blueprint
- Five-year Agricultural Development Plan for Chad (2013-2018)
- National Development Plan 2013-2015
- National Livestock Development Plan (2009-2016)
- Food Security Profile
- National Poverty Reduction Strategy document
- The Niamey declaration on Intended Nationally Determined Contributions (INDC) for the agricultural, livestock and forestry sectors in April 2015
- Project to Improve the Resilience of Agricultural Systems in Chad (PARSAT), launched in 2015
- Regional Programme for the Promotion of Household and Alternative Energies in the Sahel (PREDAS)
- National Food and Nutrition Policies 2014-2025

Carbon offsets

As a Non-Annex I Party of the United Nations Framework Convention on Climate Change (UNFCCC) and Least Developed Countries (LDC), the Republic of Chad does not intend to appeal to the international carbon markets in order to compensate for its own emissions. The country hopes, by contrast, to encourage investment in mitigation projects on its own territory, notably by means of the Clean Development Mechanism (CDM) and the REDD+ programme. These initiatives must particularly focus on sharing benefits with the local population, for example in terms of: (i) access to sustainable energy for all (ii) generation of local jobs, (iii) reducing impact on health and on the environment, (iv) reducing inequalities, including gender-based inequality and (v) respecting human rights.

Accounting / verification system

The monitoring and assessment system will entail quantifying GHG emissions on a national level, as well as their evolution over time, with the aim of periodically providing robust data reflecting the country's progress with regards to mitigation and sustainable development. A measurement, reporting and verification system (MRV) must be drawn up, with the aim of being precise but also simple. In order to reduce inherent institutional, technical, political and financial risks, it will be necessary to reinforce technical capacity, as well as research and stakeholder coordination, in order to carry out this activity. Chad encourages the Parties cited in Annex I of the Convention to technically and financially support the establishment of follow-up and assessment initiatives in Chad.

Institutional arrangements for implementation

Implementing mitigation actions and reaching the GHG emission limitation objectives set out in Chad's INDC include aspects which are conditional on the availability of international support in terms of funding, technology transfer and reinforcement of capacity. To prepare and implement mitigation projects, the country intends to request international aid from different available sources, in particular from agencies for development assistance, bilateral and multilateral financial institutions, UNFCCC financial mechanisms (Green Fund for the climate, adaptation funds, GEF etc.) and the private sector. Funding needs have been estimated at approx. 21.233 billion US\$. Implementation of Chad's INDC will place particular emphasis on better taking account of human rights and equality between the sexes.

Ambitious and fair nature of the intended contribution

Limiting the growth of GHG emissions represents, in itself, a great challenge for Chad, considering national circumstances. In economic terms, Chad is classed amongst the Least Developed Countries (LDC), having a GDP per inhabitant of 676 USD.

Chad suffers significant structural vulnerabilities, due in particular to the country's isolation and its exposure to natural and climatic hazards. According to statistics from the United Nations, Chad has an Economic Vulnerability Index of 52.8, compared to an average of 45.7 in 2012 among all of least developed countries. In the face of these developmental challenges, the contribution from the Republic of Chad is ambitious, as it establishes an allowance of 2314.66 GgCO₂e, on average, per year for 15 years, for the unconditional scenario. This objective will be achieved by various means, including increasing the renewable electricity supply from 0 to 750 GWh/year in 15 years, i.e. to a level equivalent to double the current total national production for all sectors included and introducing/reinforcing sustainable practices in the waste management, agriculture, livestock, land use and forestry sectors.

The established contribution is also fair as GHG emissions per inhabitant in Chad are around 0.732 tCO₂e, placing them amongst the lowest in the world. In line with the unconditional objective, emissions per inhabitant in 2030 will be 1.028 tCO₂e, whereas they would be just 0.364 tCO₂e if means are acquired to enable the country to reach the conditional objective of a 71% reduction.

Chad intends to achieve this established contribution whilst pursuing its development objectives and using its available resources in a sustainable manner.

Section 5. Summary of projects to be implemented under the INDC

The table below provides a summary, with figures, of the opportunities to achieve the INDC objectives. It will only be possible to achieve the conditional objectives with contributions from the international community amounting to 17,919,837,663 USD.

Table 6. Opportunities and necessary financial means to implement the INDC⁵

A. Adaptation		
Programmes	Unconditional USD	Conditional USD
<i>Develop access to water whilst ensuring it is used to its full potential</i>	1,176,350,000	950,959,000
<i>Promote water-efficient and intensive agriculture</i>	1,247,400,000	8,316,000,000
<i>Secure animal and fishery production and promote associations</i>	118,792,000	1,000,000,000
<i>Support development of fishing resources</i>	14,616,000	24,795,400
<i>Develop of renewable energies for the agriculture and pastoral sectors</i>	2,890,146	19,267,642
<i>Reinforce cloud-seeding operations to compensate for the rainfall deficit in agriculture</i>	18,000	24,000,000
<i>Strengthen meteorological and climate networks and improve weather and climate forecasting tools</i>	10,000,000	24,000,000
<i>Communication relating to climate risks and adaptation scenarios</i>	1,000,000	22,584,300
<i>Maintain initiatives in favour of the environment (FSE)</i>	39,421,800	400,000,000
<i>Improve access to agriculture production and livestock zones</i>	179,419,372	598,064,572
S/total	2,789,907,318	11,379,670,914
B. Mitigation⁶		
<i>Interconnection of Chad-Cameroon power grids to supply Chad with hydro-generated energy of 500 GWh</i>	57,245,500	542,754,500
<i>Production of solar energy increased to 200 GWh/year, i.e. : 140 MW/year</i>	184,099,840	1,840,998,400
<i>Production of wind energy up to 50 GWh/year</i>	12,582,052	125,820,515
<i>Construction of a national 225 kv line to interconnect all cities</i>	70,500,000	550,000,000
<i>Cross-country power grid (between adjacent cities)</i>	40,695,402	406,954,023
<i>Use of butane gas and promotion of efficient domestic energy</i>	57,758,620	180,000,000
<i>Development of the agro-silvo-pastoral and fishery sectors</i>	9,827,586	825,141,380
<i>Programme of environmental protection and sustainable management of natural resources</i>	34,032,100	721,289,300
<i>CHAD REDD R-PP Project</i>	750,000	45,796,400
<i>Great Green Wall project</i>	15,517,240	144,259,000
<i>National programme for the development of green belts surrounding large urban cities</i>	25,862,070	1,035,000,000
<i>Environmental risk management</i>	7,782,000	77,820,000
<i>Waste processing plants in large urban centres</i>	6,649,985	44,333,231
S/total	523,302,394	6,540,166,749
Overall total	3,313,209,712	17,919,837,663

⁵Main sources: PNISR, master energy blueprint, PNSA, Agriculture transformation plan, NAPA, R-PP.

⁶The 7 latest programmes of the "Mitigation" component are going to contribute greatly to carbon sequestering.

Section 6. Appendices

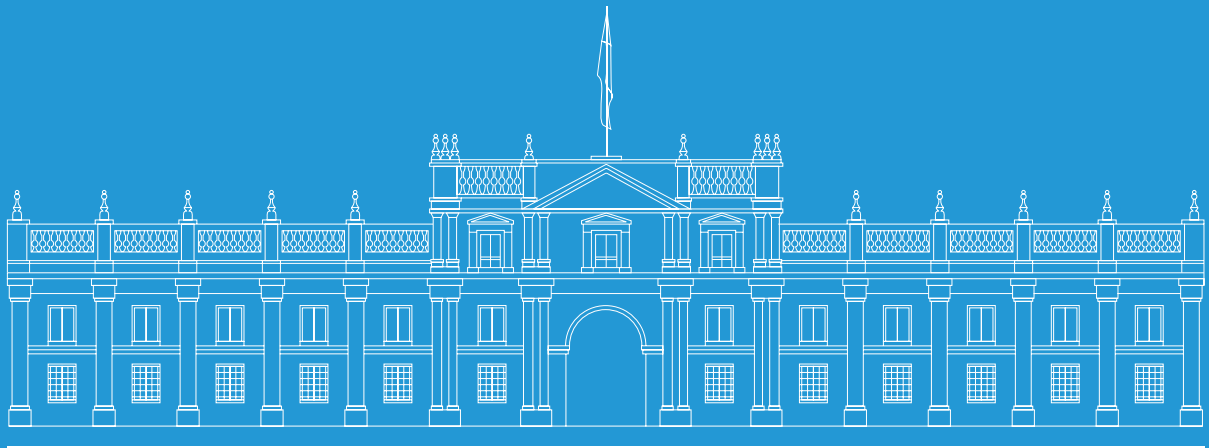
Annexe 1: INDC implementation plan

Table 7. Flowchart of activities for the INDC project

Products / Activities	2016-2020					2021-2025					2026-2030				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1. Establishment of an institutional, legal and regulatory framework for the implementation of the INDC	█														
2. INDC launch workshop	█														
3. Communication strategy	█														
4. Reinforcement of national and sectoral capacities	█	█													
5. Setting up of a MRV system			█	█											
6. Sectoral workshops	█	█	█	█	█	█									
7. Finalisation of plans for priority projects	█														
8. Call to the International Community and the mobilisation of funds	█	█	█	█	█										
9. Mobilisation of climate funding						█									
10. Pilot phase of the INDC	█	█	█	█	█	█									
11. Acquisition of adaptation and/or mitigation technologies	█	█	█	█	█										
12. Implementation of the first priority adaptation and/or mitigation projects	█	█	█	█	█	█	█	█	█	█	█	█	█		
13. Evaluations of the first INDC reductions												█	█		█
14. Verification												█	█		█
15. Certification												█	█		█
16. Preparation the implementation report														█	█
17. Assessment workshop															█



**INTENDED NATIONALLY DETERMINED
CONTRIBUTION OF CHILE
TOWARDS THE CLIMATE AGREEMENT
OF PARIS 2015**



INTENDED NATIONALLY DETERMINED CONTRIBUTION OF CHILE
TOWARDS THE CLIMATE AGREEMENT OF PARIS 2015



The Committee of Ministers for Sustainability and Climate Change agreed, in its session on 29 September 2015, to support the content of this National Contribution to the 2015 Paris Climate Agreement.

Chile's National Contribution was presented for publishing to the United Nations Framework Convention on Climate Change on 29 September 2015.

Santiago, Chile. September 2015.

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“Climate change deepens inequalities and multiplies threats. It is our obligation to address this problem before its consequences become irreversible. Future generations will judge us not only for the growth of our economy and its social impacts, but also for our capacity to face the climate change challenge”

Michelle Bachelet, President of Chile.

PROLOGUE

Chile has positioned itself in the international arena as a country that seeks to support strong climate action. We are convinced that strong and consistent signals must be provided in order to secure the necessary agreements to address the challenge of climate change.

Achieving this position meant taking leadership as a country to facilitate – and pioneer – the operation of international carbon markets. In recent years this has been confirmed through the generation of a portfolio of Nationally Appropriate Mitigation Actions (NAMAs), an unprecedented carbon tax that will take effect in 2017, the recently updated Biennial Report presented at the COP20, and the national and sector specific adaptation plans approved by the Chilean Government's Committee of Ministers for Sustainability and Climate Change.

In this context, Chile faced the challenge of preparing a robust and coherent Intended Nationally Determined Contribution (INDC) that would consider a comprehensive approach to address the various facets of climate change affecting the country.

Chile's INDC is built on three key areas: "Resilience to climate change", including the pillars of Adaptation and Capacity Building; "Control of greenhouse gas emissions", comprising the Mitigation pillar; and "cross-support for climate action", including technolo-

gy transfer and development pillars as well as climate finance.

Chile undertook the process of preparing its INDC as an opportunity to systematically work on climate management from an inter-ministerial public policy approach. The INDC draft was first prepared by experts from a group of ministries and then submitted to a four month formal public consultation process. Chile's final INDC was ratified by the Committee of Ministers for Sustainability and Change Climate. This process demonstrates the true vocation of the Chilean government to work in coordination to address the climate challenge.

Through its INDC, Chile wants to materialize a formal expression of interest not only by contributing to mitigation and adaptation, but also by highlighting contributions in other areas of the international climate management agenda.

In particular, we are collaborating in the development of South-South joint actions to support the building and strengthening of climate capacities for coordinated action by the Convention. We are preparing strategies related to climate technology transfer along with national climate finance.

Through the development of these important tools in the coming years and the adoption a long-term approach, we will be better prepared to systematically address the challenges posed by climate change to countries around the world.



1

NATIONAL CONTEXT

Chile is highly vulnerable to the impacts of Climate Change. The country's low coastline, the snow and glacier regime of its rivers, the forests which Chile is trying to protect and restock, its ocean waters -which supply the fishing industry, a key resource for the country- are all encompassed within the 9 criteria set forth by Article 4 of the United Nations Framework Convention on Climate Change (UNFCCC).

Along the same lines, the 5th Report of the Intergovernmental Panel on Climate Change¹ highlights the severe impacts faced by the country's resources and ecosystems, particularly by its fishing, aquaculture, forestry, livestock and farming sectors, water resources, and biodiversity, as well as its temperature and rainfall levels. These vulnerabilities and impacts have also been documented in the national communications² to the UNFCCC Secretariat and are being duly incorporated to the National Climate Change Action Plan³.

In addition, Chile suffers from other non-environmental vulnerabilities. In the last decade, mining has averaged 57% of total national exports, with copper accounting for almost all of them. This shows that Chilean exports are strongly concentrated on primary goods, whose prices, being commodities, are highly dependent on the fluctuations of international markets.

Chile's vulnerability is also heightened by its technological needs, including those required to mitigate and adapt to Climate Change, as a result of a still partial absorption of technology transfer and the low incentives to Research and Development. Furthermore, the current average cost of electricity for Chileans is one of the highest among OECD countries.

On the other hand, our economy is still at the mercy of the international market, given its high level of economic integration, both in commercial and financial terms, which exposes it to external turmoil. Despite all of the above, the soundness of public funding and the financial standing of the Government, as well as the credibility

1 IPCC, 2014. CLIMATE CHANGE 2014: Impacts, adaptation and vulnerability. Part B: Regional aspects. Contribution of Work Group II to the Fifth Assessment Report of the IPCC http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-PartB_FINAL.pdf

2 Ministry of Environmental Affairs. (2000) and (2011). First and Second National Communication of Chile before the United Nations Framework Convention on Climate Change. Santiago. <http://portal.mma.gob.cl/cc-08-2-comunicaciones-nacionales/>

3 Plan de Acción Nacional de Cambio Climático 2008-2012 (PANCC). <http://portal.mma.gob.cl/plan-de-accion-nacional-de-cambio-climatico-2008-2012-pancc/>

8 attained by the country during the years of application of economic policy based on the Structural Balance Rule, has allowed Chile to stay on the road of sustained growth.

Despite Chile's progress in the 90s in providing coverage in services such as health and education, improving the quality of such services remains an issue. In this regard, reducing the high levels of inequality in the Chilean economy as well as providing security to vulnerable groups with little social protection are still pending tasks. These are important challenges for Chile, which is trying to look to the future and make progress, searching for climate resilient low-carbon growth opportunities that will allow it to increase economic growth and the welfare of its population increasing less its greenhouse gas emissions.

Along these lines, Chile has made major efforts to fight Climate Change. These include the incentive to Non-conventional Renewable Energies (NCRE), which, pursuant to Law 20.698, requires that, by 2025, 20% of the energy under supply contracts subject to said law be generated from non-conventional renewable energies.

The energy agenda run by the current administration considers the active involvement of all sectors of society, including the private sector and the civil community, and seeks to transition to a cleaner matrix and raise the barriers faced by NCRE in the country. The goal is for 45% of all the electric generation capacity installed in the country between 2014 and 2025 to be generated from this type of sources. In 2014, the installed capacities of non-conventional renewable energies doubled with respect to 2013, and the recent tenders called for electricity supply awarded to this type of technology proves that this sector will continue to expand, driven by the investments made by the private sector.

Chile has also pioneered the use of greenhouse gas mitigation tools, by including the first tax over CO₂ emissions from fixed sources in a tax reform passed in 2014, thus contributing to counteract environmental external factors. Specifically, the country introduces a tax both on global contaminant emissions (CO₂) and local contaminant emissions (SO_x, NO_x, PM).

In the case of global contaminants, a US\$5 tax is set per ton of CO₂. In addition, a tax on new cars was imposed, based on urban performance and NO_x emissions. All this is encompassed under Law 20.780, which since its enactment on December 28, 2014 has resulted in a reduction of inefficient and contaminating cars in the last year.

The social consequences of Climate Change are crucial for establishing goals to face this phenomenon, and require a joint effort by the Government, the private sector and civil society. Environmental degradation, and climate change in particular, takes its deepest toll on the most vulnerable sectors of the population and is, thus, a factor which enhances social inequality. Therefore, it is important to adopt perspectives which allow to counteract such effects, including the protection and promotion of all the human rights potentially undermined by this phenomenon.

According to the International Energy Agency, the average global per capita CO₂ emissions had reached 4.5 tons per person by 2012. Chile was very close to this global average, and was well below the 9.7 tCO₂ per capita average of OECD countries. With respect to Latin America, in 2012 Chile was responsible for 4.7% of the region's emissions, below Mexico, Brazil, Argentina and Venezuela. Globally, its contribution was about 0.25% of global emissions.

Chile's intended contribution to the UNFCCC objective is based on the country's current situation and is based on five basic pillars: i. Mitigation, ii. Adaptation, iii. Capacity Building and Strengthening, iv. Technology Development and Transfer, and v. Financing.



2

MITIGATION

2.1 Context

Chile's Intended Nationally Determined Contribution (INDC) on mitigation is committed to a quantified reduction of the intensity indicator of greenhouse gas emissions (GHG) for 2030.

This reduction is based on the sectorial analyses and the mitigation scenarios developed with MAPS Chile (Phase 2)⁴, the results of the National Greenhouse Gas Inventory (1990-2010)⁵, and additional information provided by the Ministries of Environment, Energy, Agriculture and Finance, as well as the observations received during the Public Consultation of the Intended National Contribution⁶.

Chile hopes to reduce its greenhouse gas emissions while decreasing poverty and inequality as well as continue advancing toward sustainable, competitive, inclusive and low-carbon development. To confront these challenges successfully, the country should direct all its domestic efforts and international alliances to decoupling economic growth from greenhouse gas emissions.

The priority sectors for mitigation in Chile are those identified in the National Greenhouse Gas Inventory (1990-2010), namely:

- Energy, which includes the generation and transport of electricity, transportation, industry, mining, housing, among other fossil fuel consuming sectors
- Industrial processes
- Use of solvents and other products
- Agriculture, including the livestock sector
- Use of the land, change of use of the land and forestry (LULUCF)
- Waste

4 www.mapschile.cl. The measures analyzed by the MAPS Chile Project do not necessarily represent the mitigation strategy chosen by the Government of this country.

5 <http://portal.mma.gob.cl/primer-informe-bienal-de-actualizacion-de-chile/>

6 <http://portal.mma.gob.cl/consultacontribucion/>

2.2. Intended Nationally Determined Contribution to Mitigation

Chile has chosen to report its contribution in the form of emissions intensity (tons of CO₂ equivalent per Gross Domestic Product (GDP) in million CLP\$₂₀₁₁). In terms of methodology, it was decided to separate the LULUCF sector from the national mitigation commitment, due to the high annual variability of the sector's sequestrations and emissions, and because it is less dependent on the path of economic growth.

Along these lines, two types of commitments were defined:

- A carbon intensity target, expressed in greenhouse gas emissions per GDP unit, which includes all the sectors quantified in the National Greenhouse Gas Inventory (1990-2010), except for the LULUCF sector.
- A target expressed in CO₂eq tons from the LULUCF sector.

Carbon intensity target, not including the LULUCF sector:

a) Chile is committed to reduce its CO₂ emissions per GDP unit by 30% below their 2007 levels by 2030, considering a future economic growth which allows to implement adequate measures to reach this commitment⁷.

b) In addition, and subject to the grant of international monetary funds⁸, the country is committed to reduce its CO₂ emission per GDP unit by 2030 until it reaches a 35% to 45% reduction with respect to the 2007 levels, considering, in turn, a future economic growth which allows to implement adequate measures to achieve this commitment.

⁷ This commitment assumes a growth rate for the economy similar to the growth path the country has experienced in the last decade, except for the most critical years of the international financial crisis (2008-2009).

⁸ This commitment assumes a growth rate for the economy similar to the growth path the country has experienced in the last decade, except for the most critical years of the international financial crisis (2008-2009). In addition, for the purposes of this commitment, an international monetary grant shall be deemed any grants which allow to implement actions having direct effects on greenhouse gas emissions within adequate time frames.

Specific contributions to the LULUCF sector:

a) Chile has committed to the sustainable development and recovery of 100,000 hectares of forest land, mainly native, which will account for greenhouse gas sequestrations and reductions of an annual equivalent of around 600,000 of CO₂ as of 2030. This commitment is subject to the approval of the Native Forest Recovery and Forestry Promotion Law.

b) Chile has agreed to reforest 100,000 hectares, mostly with native species, which shall represent sequestrations of about 900,000 and 1,200,000 annual equivalent tons of CO₂ as of 2030. This commitment is conditioned to the extension of Decree Law 701 and the approval of a new Forestry Promotion Law.

2.3. Information Reported to the Secretariat of the UNFCCC for Understanding and Transparency

Carbon intensity target, not including the LULUCF sector:

- 2.3.1. Base year:** 2007
- 2.3.2. Target year:** 2030
- 2.3.3. Carbon intensity per GDP in base year 2007:** 1.02 tCO₂e/million CLP\$ 2011
- 2.3.4. Carbon intensity per GDP. Target year 2030:** 0.71 tCO₂e/million CLP\$ 2011 (subject to economic growth)
- 2.3.5. Carbon intensity per GDP. Target year 2030:** 0.56-0.66 tCO₂e/million CLP\$ 2011 (subject to international monetary grants and economic growth).
- 2.3.6. Gases considered for the target:** those listed in the National Greenhouse Gas Inventory (1990-2010); that is, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbon (HFC) and perfluorocarbon (PFC).
- 2.3.7. Geographic coverage for quantifying emissions:** National Greenhouse Gas Inventory (1990-2010); that is, the entire country (continental, island and Antarctic territories).
- 2.3.8. Methodology for quantifying emissions:** 2006 IPCC Guidelines for National Greenhouse Gas Inventories (GL2006)
- 2.3.9. Global warming potential used in the transformation of non-CO₂ gases in CO₂ equivalent (CO₂eq):** those used in the National Greenhouse Gas Inventory (1990-2010). These are 1 for CO₂, 21 for CH₄, 310 for N₂O, and they are consistent with the values of the Fourth IPCC Report (AR4)⁹ for a 100 year time horizon.
- 2.3.10. Sectors of the national greenhouse gas inventory included in the carbon intensity target:** energy, industrial processes, use of solvents and other products, agriculture and waste. It does not include the LULUCF sector.

⁹ <https://www.ipcc-wg1.unibe.ch/publications/wg1-ar4/ar4-wg1-chapter2.pdf>

Table 1: Chile’s National Greenhouse Gas Inventory: Emissions and absorptions of GHG (Gg CO₂eq) by sector for 2010¹⁰

Sector	2010
1. Energy	68.410,0
2. PI	5.543,2
3. UDOP	243,0
4. Agriculture	13.825,6
5. LULUCF	-49.877,4
6. Waste	3.554,1
Total (incl. LULUCF)	41.698,5
Total (excl. LULUCF)	91.575,9

2.3.11. Sources of data used for defining the intensity target:

2.3.11.1. Forecast and methodology for forecasting the Gross Domestic Product: chapters IV.1.2 and Appendix 2.2. of the Phase 2 Result Report of MAPS Chile for October 2014.¹¹

2.3.11.2. Forecast and methodology for forecasting the Gross Domestic Product: chapters IV.1.1 and Appendix 2.1. of the Phase 2 Result Report of MAPS Chile for October 2014.

2.3.11.3. Assumptions and methodologies for forecasting fuel and electricity prices: Chapter IV.1.7 and Appendices 2.6, 2.7, 2.8, 2.9 in the Report of Phase 2 Results of MAPS Chile, October 2014.

2.3.11.4. Methodologies for forecasting energy demand, sectorial models and macroeconomic models. Report of Phase 2 Results of MAPS Chile, October 2014.

2.3.12. As regards markets, Chile does not rule out using international GHG emission transaction markets to comply with the commitments assumed under its INDC as documented herein.

Target of the LULUCF sector:

The contribution related to the first commitment of the sector is based on sustainable development and recovery of degraded forests, mostly native. For the period 2020-2030, at least 100,000 hectares will be intervened, through recovery-associated activities, for which

¹⁰ http://portal.mma.gob.cl/wp-content/doc/2014_11-BA_Chile_Espanol.pdf

¹¹ http://mapschile.cl/files/Resultados_de_Fase_2_mapschile_2910.pdf

adequate forestry measures will be taken (such as supplementary planting and exclusion of animals).

In addition, measures are being considered aimed at reducing emissions to reduce or prevent forest degradation, which will be applied in forests with non-existent or low levels of anthropic origin deterioration, but with an apparent risk potential. These activities will consider, for instance, preventive forestry against wildfires and comprehensive biomass sustainable use measures, mainly timber. Wildfires and the illegal harvest of timber are the main precursors of forest degradation in Chile, based on the last updated report by the INGEI.

In relation to the second commitment of the LULUCF sectors, this could be achieved through plantation (forestation) of degraded lands in an average surface of 100,000 hectares, mainly with native species.

2.4. Assessment of compliance with the intensity target and the LULUCF sector

2.4.1. Greenhouse gas emissions

This will be determined using the National Greenhouse Gas Inventory submitted by Chile to the Secretariat of the United Nations Framework Convention on Climate Change, through its national communication and/or biennial update report in 2027, and with the progress of the report for the year 2032, discounting emissions and sequestrations of the LULUCF sector. Units: million CO₂ equivalent tons.

2.4.2. Gross Domestic Product (GDP)

It shall be determined based on the annual growth rate of the Gross Domestic Product as published in the series of National Accounts of the Central Bank of Chile. The Gross Domestic Product shall be carried to constant 2011 prices. Units: million Chilean pesos by 2011, CLP\$ 2011.

2.4.3. Specific contribution to the LULUCF sector

In order to assess compliance with the commitments of the LULUCF sectors, the National Forestry Corporation (CONAF) and the Forestry Institute (INFOR) are working on the corresponding Monitoring, Reporting and Verification (MRV) tools.

For complying with these commitments, Chile has a series of tools. The main one is the Native Forest Recovery and Forest Promotion Law (Law 20.283), which awards credits for activities which favor the regeneration, recovery or protection of native forests.

Furthermore, the National Forestry Corporation (CONAF) is implementing the National Climate Change and Vegetation Resource Strategy. This plan, proposes climate change mitigation and adaptation measures aimed at supporting the recovery and protection of native lands and xerophytes. In addition, it promotes the plantation of vegetation in apt soils belonging to small and medium-sized producers. A state mechanism will be designed and implemented to facilitate access by communities and owners to the benefits associated with the environmental services generated by these recovered ecosystems.

2.5. Mitigation contribution implementation and follow-up processes

The processes for the implementation and follow-up of Chile's contributions include the following tools:

- Chile's National Greenhouse Gas Inventory System, which contains all the institutional, legal and procedural measures set forth for the biennial update of the country's national inventory.
- National Climate Change Action Plan 2016-2021, which is currently being prepared with a cross-sectional integrated approach to mitigation, adaptation and capacity-building, which aims at implementing actions and allocating mitigation responsibilities.
- National Energy Agenda led by the Ministry of Energy, which includes the following targets: 30% reduction in the marginal costs of electric energy by 2018, 20% of the energetic matrix should be

made up of non-conventional renewable energies by 2025, a 20% reduction in the energy consumption forecast by 2025, and the design of a long-term energy development strategy.

- National Sustainable Construction Strategy, led by the Ministry of Housing and Urban Development, which will set forth the guidelines to integrate the concept of sustainable development to the construction sector. This strategy seeks to articulate and link effective energy and environmental plans by establishing goals and objectives in the area of energy, water, waste and health for the long, medium and long-term.

- Nationally Appropriate Mitigation Actions (NAMAs) in all sectors of the economy.

- CO₂ emission tax approved by the Tax Reform, Law 20.780 dated October 2014, which shall become effective on January 1, 2017. The reform establishes an annual tax benefit lien on carbon dioxide, among other gases, produced by facilities whose stationary sources, made up of boilers or turbines, have an aggregate thermal power equal or higher than 50 MWt (thermal megawatts). The tax shall be equivalent to 5 US Dollars for every ton of CO₂.

- Tax on the initial sale of lightweight vehicles pursuant to Law 20.780, which has been implemented since December 28, 2014 and which taxes CO₂ emissions indirectly, by charging a higher tax inversely proportional to vehicle performance.

2.6. Chile's work on short-lived climate pollutants

In the same way as other countries, Chile recognizes that the actions aimed at reducing short-lived climate pollutants (SLCP) entail a substantial contribution to the mitigation of the causes of Climate Change. In addition, these actions have known concomitant benefits, in terms of reducing the levels of local atmospheric pollution in urban centers.

Black carbon, which is considered a SLCP, accounts for a substantial part of the particulate (PM_{2.5}) measured in Chilean cities. Main sour-

18 ces of black carbon in Chile come from diesel transport, heating and residential wood fired cooking. The 2014-2018 Atmospheric Decontamination Strategy of the Chilean Government contemplates the implementation of atmospheric decontamination plans for fine particulate matter.

Our country considers that the efforts made in reducing black carbon in the regions which have high levels of this substance will make a significant contribution to the sustainability of Chile's development and various forms of technical cooperation and international financing to support such initiatives will be welcome.





3 | ADAPTATION

3.1. Context

Chile is highly vulnerable to Climate Change. Forecasts indicate a decrease in rainfall and a temperature rise in most of the country, especially in the mid-northern region. As regards rainfall, an important decrease is anticipated for the central region. An increase in the frequency and magnitude of extreme events, such as droughts and floods, is also expected.

All these changes shall have a direct or indirect impact on our cities, our lifestyles, the ecosystems and the country's productive activities. For this reason, adaptation has been identified as one of the main axis of Chile's Climate Change strategy, so as to minimize the threats to its social and economic development.

Our country currently has a National Climate Change Adaptation Plan, approved by the Sustainability Ministers' Council in December 2014. This plan defines the guidelines for adaptation in the country and provides an operational structure for its coordination and implementation, both with sectorial and cross-sectional approaches, in different administrative territorial levels.

Pursuant to this national plan, two sectorial adaptation plans have been developed and approved (forestry and agriculture, and biodiversity plans), while other seven plans are scheduled: water resources, fisheries and aquaculture, health, energy, infrastructure, cities and tourism, sectors which jointly represent Chile's priorities in terms of adaptation. The measures of the two approved sectorial plans are currently undergoing a process of gradual implementation, supported with national and international financing.

For instance, the forestry and agriculture plan is made up of 21 measures which mainly focus around water management, research, information and capacity-building, risk management and agricultural insurance and forestry management.

The biodiversity plan considers 50 measures which focus around research and development of management capacities, information and environmental awareness at the national and local level, the promotion of sustainable farming practices and the maintenance of environmental services, as well as the consideration of the biodiversity objectives in territorial planning, and lastly, the implementation of adaptation measures for ecosystems and ground and water ecosystem species, coastline, continental and oceanic island water systems, both in rural and urban areas.

3.2. Intended Nationally Determined Contribution to Adaptation

In the process of adaptation to Climate Change, it is key for all relevant players, particularly the sub-national governments and the citizens, to become involved. For the implementation of the lines of action described in this document, in addition to the national funds allocated for this effect, Chile will also seek international financing mechanisms.

Adaptation actions will be structured around two different cycles: the first one to be completed in 2021, and the second one to be completed in 2030.

3.2.1. In order to have the necessary tools to face the impacts of Climate Change by 2021, Chile proposes at least the following:

- Implementing specific actions aimed at increasing resilience in the country, under the National Climate Change Adaptation Plan and the sectorial plans, with a decentralized perspective and seeking to integrate efforts among the different decision-making levels (national, regional, and municipal).
- Identifying sources of financing to implement said plans, based on the considerations set forth in the financing section of this contribution.
- Building synergies with the contemplated mitigation initiatives, and maximizing the benefits that stem from the development and capacity-building pillars, as well as technology

creation and transfer included in this contribution.

- Strengthening the institutional background of the adaptation in Chile.
- Preparation of metrics and measurement tools of the sectorial plans.

3.2.2. As of 2021, Chile has set the following aims:

- Initiating a second cycle of sectorial plans for Climate Change adaptation, based on the experience gained so far
- Having an updated National Adaptation Plan.
- Developing a national assessment practice by 2026, through vulnerability indicators and methodologies aimed at determining the increase of the capacity of adaptation of the individuals, communities and systems impacted by Climate Change.



4

CAPACITY BUILDING AND STRENGTHENING

4.1. Context

Chile requires a defined strategy to strengthen national and international capacities in the face of Climate Change. Although the Ministry of the Environment, in collaboration with the Ministry of Foreign Affairs, has implemented south-south-north collaborative projects that allow for national capacity-building and strengthening in relation to Climate Change, the country currently has valuable information and learning which it can make available to its citizens, particularly the most vulnerable sectors, but which it can also put to the service of its peers under the UNFCCC.

In coordination with the Ministry of Education, Chile has begun to introduce the challenges and opportunities of Climate Change in school curriculums. It has also created platforms for the management and distribution of information on Climate Change. These efforts should be continued, increased and spread as part of south-south cooperation. The country aspires to have its citizens educated on sustainable, inclusive, resilient and low-carbon development.

4.2. Intended Nationally Determined Contribution to Capacity-Building

4.2.1. The creation of forecast models that Chile can share and distribute nationally and internationally, both through individual efforts and jointly with other countries determined to take action.

4.2.2. Seminars, organized in conjunction with other countries willing to provide training and coaching support to nations which so require it, through the preparation and reporting of their planned national contributions, greenhouse gas emission inventories, national communications, biennial update reports, and nationally appropriate mitigation actions (NAMAs).

4.2.3. The preparation of instruments to promote research and capacity-building at the national and sub-national level, strengthening

26 the response capacity of the communities and local governments, so as to strengthen national adaptation capacity through institutional development and the capacity-building of the groups and sectors of the country which are most vulnerable to the impacts of Climate Change.





5

TECHNOLOGY DEVELOPMENT AND TRANSFER


5.1. Context

Chile still requires a technology development and transfer strategy in order to face the national challenges related to Climate Change.

5.2. Intended Nationally Determined Contribution to Technology Development and Transfer

In 2018 Chile will have a technology development and transfer strategy which will include at least the following:

- 5.2.1.** A baseline analysis of spending and investment in technology;
- 5.2.2.** Mapping of needs and technological priorities for climate change;
- 5.2.3.** Identification of possible implementation synergies to be used in the technological response to adaptation and mitigation of Climate Change.



6 | FINANCING

6.1. Context

Chile currently still requires a cross-sectional financing strategy to face national challenges posed by Climate Change. It is evident that part of the public national expenditure has had a positive impact in terms of resilience and Climate Change mitigation in the country, based on our 2020 commitment. Thus, in order to contribute effectively in the context of a post-2020 agreement, Chile needs to conduct a national evaluation of the expenditure on this matter, to make a contribution to the climate arena from its national circumstances and in line with its capacities.

6.2. Intended Nationally Determined Contribution to Financing

In 2018, Chile will report a cross-sectional National Finance Strategy for Climate Change which will include at least the following:

- A periodical Climate Change public spending analysis, both direct and indirect, which will be updated annually after 2020;
- Creation of internal institutions which will allow to optimally manage and coordinate the relationship with the Green Climate Fund, which from a multi-sectorial perspective will be in charge of raising and assessing the fundable project portfolio, among other duties;
- Design of financial instruments which can be used for purposes such as adaptation and technology transfer.

Thus Chile hopes to have a baseline for financing Climate Change at a national level. The country would also like to be able to identify and structure the financial flows according to their origin, differentiating between national vs. international and public vs. private spending; and eventually according to its performance.

With a sound evaluation of its Climate Change finance, Chile will be in a position to implement a national financing strategy that is appropriate to confront the challenges and opportunities facing the country. This evaluation will enable it to determine an optimal finan-

32 cing portfolio, and eventually obtain a sustainable supply of public and private resources to put together an array of fundable projects based on the priority areas identified in this document.

中华人民共和国国家发展和改革委员会

尊敬的克里斯蒂娜·菲格里斯女士：

作为联合国气候变化框架公约中方国家联络人，我谨此转交
后附《强化应对气候变化行动——中国国家自主贡献》。

顺致最崇高的敬意。



中国国家发展改革委应对气候变化司司长
联合国气候变化框架公约中方国家联络人

2015年6月30日于北京

中国国家发展和改革委员会应对气候变化司

DEPARTMENT OF CLIMATE CHANGE, NATIONAL DEVELOPMENT & REFORM COMMISSION OF CHINA

No. 38, Yue Tan Nan Jie, Beijing, 100824, China, Tel: +86-10-68501567, Fax: +86-10-68505881

Beijing, 30 June 2015

To: Christiana Figueres
Executive Secretary
UNFCCC secretariat
P.O. Box 260124
D-53153 Bonn
Germany
Phone: (49-228) 815-1000
Fax: (49-228) 815-1999

Dear Madam Christiana Figueres,

In my capacity as China's National Focal Point for UNFCCC, I am writing to communicate as attached China's intended nationally determined contribution: *Enhanced Actions on Climate Change*.

Please accept, Madam, the assurances of my highest consideration.



SU Wei
National Focal Point for UNFCCC
Director-General
Department of Climate Change
National Development and Reform Commission
People's Republic of China

强化应对气候变化行动

——中国国家自主贡献

气候变化是当今人类社会面临的共同挑战。工业革命以来的人类活动，特别是发达国家大量消费化石能源所产生的二氧化碳累积排放，导致大气中温室气体浓度显著增加，加剧了以变暖为主要特征的全球气候变化。气候变化对全球自然生态系统产生显著影响，温度升高、海平面上升、极端气候事件频发给人类生存和发展带来严峻挑战。

气候变化作为全球性问题，需要国际社会携手应对。多年来，各缔约方在《联合国气候变化框架公约》（以下简称公约）实施进程中，按照共同但有区别的责任原则、公平原则、各自能力原则，不断强化合作行动，取得了积极进展。为进一步加强公约的全面、有效和持续实施，各方正在就 2020 年后的强化行动加紧谈判磋商，以期于 2015 年年底在联合国气候变化巴黎会议上达成协议，开辟全球绿色低碳发展新前景，推动世界可持续发展。

中国是拥有 13 多亿人口的发展中国家，是遭受气候变化不利影响最为严重的国家之一。中国正处在工业化、城镇化快

速发展阶段，面临着发展经济、消除贫困、改善民生、保护环境、应对气候变化等多重挑战。积极应对气候变化，努力控制温室气体排放，提高适应气候变化的能力，不仅是中国保障经济安全、能源安全、生态安全、粮食安全以及人民生命财产安全，实现可持续发展的内在要求，也是深度参与全球治理、打造人类命运共同体、推动全人类共同发展的责任担当。

根据公约缔约方会议相关决定，在此提出中国应对气候变化的强化行动和措施，作为中国为实现公约第二条所确定目标做出的、反映中国应对气候变化最大努力的国家自主贡献，同时提出中国对 2015 年协议谈判的意见，以推动巴黎会议取得圆满成功。

一、中国强化应对气候变化行动目标

长期以来，中国高度重视气候变化问题，把积极应对气候变化作为国家经济社会发展的重大战略，把绿色低碳发展作为生态文明建设的重要内容，采取了一系列行动，为应对全球气候变化作出了重要贡献。2009 年向国际社会宣布：到 2020 年单位国内生产总值二氧化碳排放比 2005 年下降 40%-45%，非化石能源占一次能源消费比重达到 15%左右，森林面积比 2005 年增加 4000 万公顷，森林蓄积量比 2005 年增加 13 亿立方米。积极实施《中国应对气候变化国家方案》、《“十二五”控制温室气体排放工作方案》、《“十二五”节能减排综合性工

作方案》、《节能减排“十二五”规划》、《2014—2015年节能减排低碳发展行动方案》和《国家应对气候变化规划（2014—2020年）》。加快推进产业结构和能源结构调整，大力开展节能减碳和生态建设，在7个省（市）开展碳排放权交易试点，在42个省（市）开展低碳试点，探索符合中国国情的低碳发展新模式。2014年，中国单位国内生产总值二氧化碳排放比2005年下降33.8%，非化石能源占一次能源消费比重达到11.2%，森林面积比2005年增加2160万公顷，森林蓄积量比2005年增加21.88亿立方米，水电装机达到3亿千瓦（是2005年的2.57倍），并网风电装机达到9581万千瓦（是2005年的90倍），光伏装机达到2805万千瓦（是2005年的400倍），核电装机达到1988万千瓦（是2005年的2.9倍）。加快实施《国家适应气候变化战略》，着力提升应对极端气候事件能力，重点领域适应气候变化取得积极进展。应对气候变化能力建设进一步加强，实施《中国应对气候变化科技专项行动》，科技支撑能力得到增强。

面向未来，中国已经提出了到2020年全面建成小康社会，到本世纪中叶建成富强民主文明和谐的社会主义现代化国家的奋斗目标；明确了转变经济发展方式、建设生态文明、走绿色低碳循环发展的政策导向，努力协同推进新型工业化、城镇化、信息化、农业现代化和绿色化。中国将坚持节约资源和保

保护环境基本国策，坚持减缓与适应气候变化并重，坚持科技创新、管理创新和体制机制创新，加快能源生产和消费革命，不断调整经济结构、优化能源结构、提高能源效率、增加森林碳汇，有效控制温室气体排放，努力走一条符合中国国情的经济发展、社会进步与应对气候变化多赢的可持续发展之路。

根据自身国情、发展阶段、可持续发展战略和国际责任担当，中国确定了到 2030 年的自主行动目标：二氧化碳排放 2030 年左右达到峰值并争取尽早达峰；单位国内生产总值二氧化碳排放比 2005 年下降 60%—65%，非化石能源占一次能源消费比重达到 20% 左右，森林蓄积量比 2005 年增加 45 亿立方米左右。中国还将继续主动适应气候变化，在农业、林业、水资源等重点领域和城市、沿海、生态脆弱地区形成有效抵御气候变化风险的机制和能力，逐步完善预测预警和防灾减灾体系。

二、中国强化应对气候变化行动政策和措施

千里之行，始于足下。为实现到 2030 年的应对气候变化自主行动目标，需要在已采取行动的基础上，持续不断地做出努力，在体制机制、生产方式、消费模式、经济政策、科技创新、国际合作等方面进一步采取强化政策和措施。

（一）实施积极应对气候变化国家战略。加强应对气候变化法制建设。将应对气候变化行动目标纳入国民经济和社会发展规划，研究制定长期低碳发展战略和路线图。落实《国家应

对气候变化规划（2014—2020年）》和省级专项规划。完善应对气候变化工作格局，发挥碳排放指标的引导作用，分解落实应对气候变化目标任务，健全应对气候变化和低碳发展目标责任评价考核制度。

（二）完善应对气候变化区域战略。实施分类指导的应对气候变化区域政策，针对不同主体功能区确定差别化的减缓和适应气候变化目标、任务和实现途径。优化开发的城市化地区要严格控制温室气体排放；重点开发的城市化地区要加强碳排放强度控制，老工业基地和资源型城市要加快绿色低碳转型；农产品主产区要加强开发强度管制，限制进行大规模工业化、城镇化开发，加强中小城镇规划建设，鼓励人口适度集中，积极推进农业适度规模化、产业化发展；重点生态功能区要划定生态红线，制定严格的产业发展目录，限制新上高碳项目，对不符合主体功能定位的产业实行退出机制，因地制宜发展低碳特色产业。

（三）构建低碳能源体系。控制煤炭消费总量，加强煤炭清洁利用，提高煤炭集中高效发电比例，新建燃煤发电机组平均供电煤耗要降至每千瓦时 300 克标准煤左右。扩大天然气利用规模，到 2020 年天然气占一次能源消费比重达到 10% 以上，煤层气产量力争达到 300 亿立方米。在做好生态环境保护和移民安置的前提下积极推进水电开发，安全高效发展核电，大力

发展风电，加快发展太阳能发电，积极发展地热能、生物质能和海洋能。到 2020 年，风电装机达到 2 亿千瓦，光伏装机达到 1 亿千瓦左右，地热能利用规模达到 5000 万吨标准煤。加强放空天然气和油田伴生气回收利用。大力发展分布式能源，加强智能电网建设。

(四)形成节能低碳的产业体系。坚持走新型工业化道路，大力发展循环经济，优化产业结构，修订产业结构调整指导目录，严控高耗能、高排放行业扩张，加快淘汰落后产能，大力发展服务业和战略性新兴产业。到 2020 年，力争使战略性新兴产业增加值占国内生产总值比重达到 15%。推进工业低碳发展，实施《工业领域应对气候变化行动方案（2012—2020 年）》，制定重点行业碳排放控制目标和行动方案，研究制定重点行业温室气体排放标准。通过节能提高能效，有效控制电力、钢铁、有色、建材、化工等重点行业排放，加强新建项目碳排放管理，积极控制工业生产过程温室气体排放。构建循环型工业体系，推动产业园区循环化改造。加大再生资源回收利用，提高资源产出率。逐渐减少二氟一氯甲烷受控用途的生产和使用，到 2020 年在基准线水平（2010 年产量）上产量减少 35%、2025 年减少 67.5%，三氟甲烷排放到 2020 年得到有效控制。推进农业低碳发展，到 2020 年努力实现化肥农药使用量零增长；控制稻田甲烷和农田氧化亚氮排放，构建循环型农业体系，

推动秸秆综合利用、农林废弃物资源化利用和畜禽粪便综合利用。推进服务业低碳发展，积极发展低碳商业、低碳旅游、低碳餐饮，大力推动服务业节能降碳。

（五）控制建筑和交通领域排放。坚持走新型城镇化道路，优化城镇体系和城市空间布局，将低碳发展理念贯穿城市规划、建设、管理全过程，倡导产城融合的城市形态。强化城市低碳化建设，提高建筑能效水平和建筑工程质量，延长建筑物使用寿命，加大既有建筑节能改造力度，建设节能低碳的城市基础设施。促进建筑垃圾资源循环利用，强化垃圾填埋场甲烷收集利用。加快城乡低碳社区建设，推广绿色建筑和可再生能源建筑应用，完善社区配套低碳生活设施，探索社区低碳化运营管理模式。到 2020 年，城镇新建建筑中绿色建筑占比达到 50%。构建绿色低碳交通运输体系，优化运输方式，合理配置城市交通资源，优先发展公共交通，鼓励开发使用新能源车船等低碳环保交通运输工具，提升燃油品质，推广新型替代燃料。到 2020 年，大中城市公共交通占机动化出行比例达到 30%。推进城市步行和自行车交通系统建设，倡导绿色出行。加快智慧交通建设，推动绿色货运发展。

（六）努力增加碳汇。大力开展造林绿化，深入开展全民义务植树，继续实施天然林保护、退耕还林还草、京津风沙源治理、防护林体系建设、石漠化综合治理、水土保持等重点生

态工程建设，着力加强森林抚育经营，增加森林碳汇。加大森林灾害防控，强化森林资源保护，减少毁林排放。加大湿地保护与恢复，提高湿地储碳功能。继续实施退牧还草，推行草畜平衡，遏制草场退化，恢复草原植被，加强草原灾害防治和农田保育，提升土壤储碳能力。

（七）倡导低碳生活方式。加强低碳生活和低碳消费全民教育，倡导绿色低碳、健康文明的生活方式和消费模式，推动全社会形成低碳消费理念。发挥公共机构率先垂范作用，开展节能低碳机关、校园、医院、场馆、军营等创建活动。引导适度消费，鼓励使用节能低碳产品，遏制各种铺张浪费现象。完善废旧商品回收体系和垃圾分类处理体系。

（八）全面提高适应气候变化能力。提高水利、交通、能源等基础设施在气候变化条件下的安全运营能力。合理开发和优化配置水资源，实行最严格的水资源管理制度，全面建设节水型社会。加强中水、淡化海水、雨洪等非传统水源开发利用。完善农田水利设施配套建设，大力发展节水灌溉农业，培育耐高温和耐旱作物品种。加强海洋灾害防护能力建设和海岸带综合管理，提高沿海地区抵御气候灾害能力。开展气候变化对生物多样性影响的跟踪监测与评估。加强林业基础设施建设。合理布局城市功能区，统筹安排基础设施建设，有效保障城市运行的生命线系统安全。研究制定气候变化影响人群健康应急预

案，提升公共卫生领域适应气候变化的服务水平。加强气候变化综合评估和风险管理，完善国家气候变化监测预警信息发布体系。在生产布局、基础设施、重大项目规划设计和建设中，充分考虑气候变化因素。健全极端天气气候事件应急响应机制。加强防灾减灾应急管理体系建设。

（九）创新低碳发展模式。深化低碳省区、低碳城市试点，开展低碳城（镇）试点和低碳产业园区、低碳社区、低碳商业、低碳交通试点，探索各具特色的低碳发展模式，研究在不同类型区域和城市控制碳排放的有效途径。促进形成空间布局合理、资源集约利用、生产低碳高效、生活绿色宜居的低碳城市。研究建立碳排放认证制度和低碳荣誉制度，选择典型产品进行低碳产品认证试点并推广。

（十）强化科技支撑。提高应对气候变化基础科学研究水平，开展气候变化监测预测研究，加强气候变化影响、风险机理与评估方法研究。加强对节能降耗、可再生能源和先进核能、碳捕集利用和封存等低碳技术的研发和产业化示范，推广利用二氧化碳驱油、驱煤层气技术。研发极端天气预报预警技术，开发生物固氮、病虫害绿色防控、设施农业技术，加强综合节水、海水淡化等技术研发。健全应对气候变化科技支撑体系，建立政产学研有效结合机制，加强应对气候变化专业人才培养。

（十一）加大资金和政策支持。进一步加大财政资金投入力度，积极创新财政资金使用方式，探索政府和社会资本合作等低碳投融资新机制。落实促进新能源发展的税收优惠政策，完善太阳能发电、风电、水电等定价、上网和采购机制。完善包括低碳节能在内的政府绿色采购政策体系。深化能源、资源性产品价格和税费改革。完善绿色信贷机制，鼓励和引导金融机构积极开展能效信贷业务，发行绿色信贷资产证券化产品。健全气候变化灾害保险政策。

（十二）推进碳排放权交易市场建设。充分发挥市场在资源配置中的决定性作用，在碳排放权交易试点基础上，稳步推进全国碳排放权交易体系建设，逐步建立碳排放权交易制度。研究建立碳排放报告核查核证制度，完善碳排放权交易规则，维护碳排放交易市场的公开、公平、公正。

（十三）健全温室气体排放统计核算体系。进一步加强应对气候变化统计工作，健全涵盖能源活动、工业生产过程、农业、土地利用变化与林业、废弃物处理等领域的温室气体排放统计制度，完善应对气候变化统计指标体系，加强统计人员培训，不断提高数据质量。加强温室气体排放清单的核算工作，定期编制国家和省级温室气体排放清单，建立重点企业温室气体排放报告制度，制定重点行业企业温室气体排放核算标准。积极开展相关能力建设，构建国家、地方、企业温室气体排放

基础统计和核算工作体系。

（十四）完善社会参与机制。强化企业低碳发展责任，鼓励企业探索资源节约、环境友好的低碳发展模式。强化低碳发展社会监督和公众参与，继续利用“全国低碳日”等平台提高全社会低碳发展意识，鼓励公众应对气候变化的自觉行动。发挥媒体监督和导向作用，加强教育培训，充分发挥学校、社区以及民间组织的作用。

（十五）积极推进国际合作。作为负责任的发展中国家，中国将从全人类的共同利益出发，积极开展国际合作，推进形成公平合理、合作共赢的全球气候治理体系，与国际社会共同促进全球绿色低碳转型与发展路径创新。坚持共同但有区别的责任原则、公平原则、各自能力原则，推动发达国家切实履行大幅度率先减排并向发展中国家提供资金、技术和能力建设支持的公约义务，为发展中国家争取可持续发展的公平机会，争取更多的资金、技术和能力建设支持，促进南北合作。同时，中国将主动承担与自身国情、发展阶段和实际能力相符的国际义务，采取不断强化的减缓和适应行动，并进一步加大大气候变化南南合作力度，建立应对气候变化南南合作基金，为小岛屿发展中国家、最不发达国家和非洲国家等发展中国家应对气候变化提供力所能及的帮助和支持，推进发展中国家互学互鉴、互帮互助、互利共赢。广泛开展应对气候变化国际对话与交流，

加强相关领域政策协调与务实合作，分享有益经验和做法，推广气候友好技术，与各方一道共同建设人类美好家园。

三、中国关于 2015 年协议谈判的意见

中国致力于不断加强公约全面、有效和持续实施，与各方一道携手努力推动巴黎会议达成一个全面、平衡、有力度的协议。为此，对 2015 年协议谈判进程和结果提出如下意见：

（一）总体意见。2015 年协议谈判在公约下进行，以公约原则为指导，旨在进一步加强公约的全面、有效和持续实施，以实现公约的目标。谈判的结果应遵循共同但有区别的责任原则、公平原则、各自能力原则，充分考虑发达国家和发展中国家间不同的历史责任、国情、发展阶段和能力，全面平衡体现减缓、适应、资金、技术开发和转让、能力建设、行动和支持的透明度各个要素。谈判进程应遵循公开透明、广泛参与、缔约方驱动、协商一致的原则。

（二）减缓。2015 年协议应明确各缔约方按照公约要求，制定和实施 2020—2030 年减少或控制温室气体排放的计划和措施，推动减缓领域的国际合作。发达国家根据其历史责任，承诺到 2030 年有力度的全经济范围绝对量减排目标。发展中国家在可持续发展框架下，在发达国家资金、技术和能力建设支持下，采取多样化的强化减缓行动。

（三）适应。2015 年协议应明确各缔约方按照公约要求，

加强适应领域的国际合作,加强区域和国家层面适应计划和项目的实施。发达国家应为发展中国家制定和实施国家适应计划、开展相关项目提供支持。发展中国家通过国家适应计划识别需求和障碍,加强行动。建立关于适应气候变化的公约附属机构。加强适应与资金、技术和能力建设的联系。强化华沙损失和损害国际机制。

(四) 资金。2015 年协议应明确发达国家按照公约要求,为发展中国家的强化行动提供新的、额外的、充足的、可预测和持续的资金支持。明确发达国家 2020—2030 年提供资金支持的量化目标和实施路线图,提供资金的规模应在 2020 年开始每年 1000 亿美元的基础上逐年扩大,所提供资金应主要来源于公共资金。强化绿色气候基金作为公约资金机制主要运营实体的地位,在公约缔约方会议授权和指导下开展工作,对公约缔约方会议负责。

(五) 技术开发与转让。2015 年协议应明确发达国家按照公约要求,根据发展中国家技术需求,切实向发展中国家转让技术,为发展中国家技术研发应用提供支持。加强现有技术机制在妥善处理知识产权问题、评估技术转让绩效等方面的职能,增强技术机制与资金机制的联系,包括在绿色气候基金下设立支持技术开发与转让的窗口。

(六) 能力建设。2015 年协议应明确发达国家按照公约

要求，为发展中国家各领域能力建设提供支持。建立专门关于能力建设的国际机制，制定并实施能力建设活动方案，加强发展中国家减缓和适应气候变化能力建设。

（七）行动和支持的透明度。2015 年协议应明确各缔约方按照公约要求和有关缔约方会议决定，增加各方强化行动的透明度。发达国家根据公约要求及京都议定书相关规则，通过现有的报告和审评体系，增加其减排行动的透明度，明确增强发达国家提供资金、技术和能力建设支持透明度及相关审评的规则。发展中国家在发达国家资金、技术和能力建设支持下，通过现有的透明度安排，以非侵入性、非惩罚性、尊重国家主权的方式，增加其强化行动透明度。

（八）法律形式。2015 年协议应是一项具有法律约束力的公约实施协议，可以采用核心协议加缔约方会议决定的形式，减缓、适应、资金、技术开发和转让、能力建设、行动和支持的透明度等要素应在核心协议中平衡体现，相关技术细节和程序规则可由缔约方会议决定加以明确。发达国家和发展中国家的国家自主贡献可在巴黎会议成果中以适当形式分别列出。

**ENHANCED ACTIONS ON CLIMATE CHANGE:
CHINA'S INTENDED NATIONALLY DETERMINED CONTRIBUTIONS¹**

Climate change is today's common challenge faced by all humanity. Human activities since the Industrial Revolution, especially the accumulated carbon dioxide emissions from the intensive fossil fuels consumption of developed countries, have resulted in significantly increasing the atmospheric concentration of greenhouse gases, exacerbated climate change primarily characterized by global warming. Climate change has significant impacts on global natural ecosystems, causing temperature increase and sea level rise as well as more frequent extreme climate events, all of which pose a huge challenge to the survival and development of the human race.

Climate change is a global issue that requires the collaboration of the international community. For years, in accordance with the principles of equity and common but differentiated responsibilities and respective capabilities, the Parties to *the United Nations Framework Convention on Climate Change* (hereinafter referred to as the Convention) have been working to enhance cooperation and achieved positive progress in the implementation of the Convention. To further enhance the full, effective and sustained implementation of the Convention, negotiations and consultations are now under way on enhanced actions beyond 2020, so as to reach an agreement at the Conference of the Parties to the Convention in Paris at the end

¹ This is an unofficial translation. In case of any divergence, the official text in the Chinese language shall prevail.

of 2015. This will open up a new prospect for green and low-carbon development across the globe and promote sustainable development worldwide.

As a developing country with a population of more than 1.3 billion, China is among those countries that are most severely affected by the adverse impacts of climate change. China is currently in the process of rapid industrialization and urbanization, confronting with multiple challenges including economic development, poverty eradication, improvement of living standards, environmental protection and combating climate change. To act on climate change in terms of mitigating greenhouse gas emissions and enhancing climate resilience, is not only driven by China's domestic needs for sustainable development in ensuring its economic security, energy security, ecological security, food security as well as the safety of people's life and property and to achieve sustainable development, but also driven by its sense of responsibility to fully engage in global governance, to forge a community of shared destiny for humankind and to promote common development for all human beings.

In accordance with relevant decisions of the Conference of the Parties to the Convention, China hereby presents its enhanced actions and measures on climate change as its nationally determined contributions towards achieving the objective set out in Article 2 of the Convention, which represent its utmost efforts in addressing climate change, and contributes its views on the 2015 agreement negotiations with a view to making the Paris Conference a great success.

I. ENHANCED ACTIONS ON CLIMATE CHANGE

China attaches great importance to addressing climate change since long, making it a significant national strategy for its social and economic development and promoting green and low-carbon development as important component of the

ecological civilization process. It has already taken a series of climate actions which represent a significant contribution to combating the global climate change. In 2009, China announced internationally that by 2020 it will lower carbon dioxide emissions per unit of GDP by 40% to 45% from the 2005 level, increase the share of non-fossil fuels in primary energy consumption to about 15% and increase the forested area by 40 million hectares and the forest stock volume by 1.3 billion cubic meters compared to the 2005 levels. In this connection, China has enacted and implemented *the National Program on Climate Change, the Work Plan for Controlling Greenhouse Gas Emissions during the 12th Five-Year Plan Period, the Comprehensive Work Plan for Energy Conservation and Emission Reduction for the 12th Five Year Plan Period, the 12th Five Year Plan for Energy Conservation and Emission Reduction, the 2014-2015 Action Plan for Energy Conservation, Emission Reduction and Low-Carbon Development, and the National Plan on Climate Change (2014-2020)*. China has accelerated the adjustment of its industry and energy structures and invested great efforts in improving energy efficiency, lowering carbon emissions and enhancing the ecosystem. China has initiated carbon emission trading pilots in 7 provinces and cities and low-carbon development pilots in 42 provinces and cities to explore a new mode of low-carbon development consistent with its prevailing national circumstances. By 2014 the following has been achieved:

- Carbon dioxide emissions per unit of GDP is 33.8% lower than the 2005 level;
- The share of non-fossil fuels in primary energy consumption is 11.2%;
- The forested area and forest stock volume are increased respectively by 21.6 million hectares and 2.188 billion cubic meters compared to the 2005 levels;
- The installed capacity of hydro power is 300 gigawatts (2.57 times of that for 2005);
- The installed capacity of on-grid wind power is 95.81 gigawatts (90 times of that for 2005);

- The installed capacity of solar power is 28.05 gigawatts (400 times of that for 2005); and
- The installed capacity of nuclear power is 19.88 gigawatts (2.9 times of that for 2005).

China is accelerating the implementation of *the National Strategy for Climate Adaptation*, and improving its capacity to respond to extreme climatic events and making positive progress in key areas of climate change adaptation. Capacity building on combating climate change is further strengthened. Supports in terms of science and technology are further enhanced by implementing *China's Science and Technology Actions on Climate Change*.

Looking into the future, China has defined as its strategic goals to complete the construction of a moderately prosperous society in an all-round way by 2020 and to create a prosperous, strong, democratic, culturally developed and harmonious modern socialist country by the middle of this century. It has identified transforming the economic development pattern, constructing ecological civilization and holding to a green, low-carbon and recycled development path as its policy orientation. New industrialization, urbanization, informatization, agricultural modernization and greenisation will be promoted in a coordinated manner. Resource conservation and environmental protection have become the cardinal national policy, placing mitigation and adaptation on equal footing, promoting innovation in science and technology and putting in place the necessary management and regulatory mechanisms and systems. China will accelerate the transformation of energy production and consumption and continue to restructure its economy, optimize the energy mix, improve energy efficiency and increase its forest carbon sinks, with a view to efficiently mitigating greenhouse gas emissions. China is making efforts to embark on a sustainable development path that is in line with its national circumstances and leads to multiple wins in terms of economic development, social progress and combating climate change.

Based on its national circumstances, development stage, sustainable development strategy and international responsibility, China has nationally determined its actions by 2030 as follows:

- To achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early;
- To lower carbon dioxide emissions per unit of GDP by 60% to 65% from the 2005 level;
- To increase the share of non-fossil fuels in primary energy consumption to around 20%; and
- To increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level.

Moreover, China will continue to proactively adapt to climate change by enhancing mechanisms and capacities to effectively defend against climate change risks in key areas such as agriculture, forestry and water resources, as well as in cities, coastal and ecologically vulnerable areas and to progressively strengthen early warning and emergency response systems and disaster prevention and reduction mechanisms.

II. POLICIES AND MEASURES TO IMPLEMENT ENHANCED ACTIONS ON CLIMATE CHANGE

A one-thousand-mile journey starts from the first step. To achieve the nationally determined action objectives on climate change by 2030, China needs, building on actions already taken, to make a sustained effort in further implementing enhanced policies and measures in areas such as regime building, production mode and consumption pattern, economic policy, science and technology innovation and international cooperation.

A. Implementing Proactive National Strategies on Climate Change

- To strengthen laws and regulations on climate change;
- To integrate climate-change-related objectives into the national economic and social development plans;
- To formulate China's long-term strategy and roadmap for low-carbon development;
- To implement *the National Program on Climate Change (2014-2020)* and provincial climate programs; and
- To improve the overall administration of climate-change-related work and to make carbon-emission-related indicators play guiding role, by subdividing and implementing climate change targets and tasks, and improving the performance evaluation and accountability system on climate change and low-carbon development targets.

B. Improving Regional Strategies on Climate Change

- To implement regionalized climate change policies to help identify differentiated targets, tasks and approaches of climate change mitigation and adaptation for different development-planning zones;
- To strictly control greenhouse gas emissions in Urbanized Zones for Optimized Development;
- To enhance carbon intensity control in Urbanized Zones for Focused Development and to accelerate green and low-carbon transformation in old industrial bases and resource-based cities;
- To enhance the control of development intensity, to limit large-scale industrialization and urbanization, to strengthen the planning and construction of medium-and-small-sized towns, to encourage moderate concentration of population and to actively push forward the appropriate scale production and industrialization of agriculture in Major Agricultural Production Zones;

- To define ecological red lines, to formulate strict criteria for industrial development and to constrain the development of any new carbon intensive projects in Key Ecological Zones; and
- To introduce a withdrawal mechanism for those industries that do not match with functions of development-planning zones and to develop low-carbon industries in line with local conditions and circumstances.

C. Building Low-Carbon Energy System

- To control total coal consumption;
- To enhance the clean use of coal;
- To increase the share of concentrated and highly-efficient electricity generation from coal;
- To lower coal consumption of electricity generation of newly built coal-fired power plants to around 300 grams coal equivalent per kilowatt-hour;
- To expand the use of natural gas: by 2020, achieving more than 10% share of natural gas consumption in the primary energy consumption and making efforts to reach 30 billion cubic meters of coal-bed methane production;
- To proactively promote the development of hydro power, on the premise of ecological and environmental protection and inhabitant resettlement;
- To develop nuclear power in a safe and efficient manner;
- To scale up the development of wind power;
- To accelerate the development of solar power;
- To proactively develop geothermal energy, bio-energy and maritime energy;
- To achieve the installed capacity of wind power reaching 200 gigawatts, the installed capacity of solar power reaching around 100 gigawatts and the utilization of thermal energy reaching 50 million tons coal equivalent by 2020;
- To enhance the recovery and utilization of vent gas and oilfield-associated gas; and
- To scale up distributed energy and strengthen the construction of smart grid.

D. Building Energy Efficient and Low-Carbon Industrial System

- To embark on a new path of industrialization, developing a circular economy, optimizing the industrial structure, revising the guidance catalogue of the adjustment of industrial structure, strictly controlling the total expansion of industries with extensive energy consumption and emissions, accelerating the elimination of outdated production capacity and promoting the development of service industry and strategic emerging industries;
- To promote the share of value added from strategic emerging industries reaching 15% of the total GDP by 2020;
- To promote low-carbon development of industrial sectors, implementing *Action Plan of Industries Addressing Climate Change (2012-2020)* and formulating carbon emission control target and action plans in key industries;
- To research and formulate greenhouse gas emission standards for key industries;
- To effectively control emissions from key sectors including power, iron and steel, nonferrous metal, building materials and chemical industries through energy conservation and efficiency improvement;
- To strengthen the management of carbon emissions for new projects and to actively control greenhouse gas emissions originating from the industrial production process;
- To construct a recycling-based industrial system, promoting recycling restructure in industrial parks, increasing the recycling and utilization of renewable resources and improving the production rate of resource;
- To phase down the production and consumption of HCFC-22 for controlled uses, with its production to be reduced by 35% from the 2010 level by 2020, and by 67.5% by 2025 and to achieve effective control on emissions of HFC-23 by 2020;

- To promote the low-carbon development in agriculture, making efforts to achieve zero growth of fertilizer and pesticide utilization by 2020;
- To control methane emissions from rice fields and nitrous oxide emissions from farmland;
- To construct a recyclable agriculture system, promoting comprehensive utilization of straw, reutilization of agricultural and forestry wastes and comprehensive utilization of animal waste; and
- To promote low-carbon development of service industry, actively developing low-carbon business, tourism and foodservice and vigorously promoting service industries to conserve energy and reduce carbon emissions.

E. Controlling Emissions from Building and Transportation Sectors

- To embark on a new pattern of urbanization, optimizing the urban system and space layout, integrating the low-carbon development concept in the entire process of urban planning, construction and management and promoting the urban form that integrates industries into cities;
- To enhance low-carbonized urbanization, improving energy efficiency of building and the quality of building construction, extending buildings' life spans, intensifying energy conservation transformation for existing buildings, building energy-saving and low-carbon infrastructures, promoting the reutilization of building wastes and intensifying the recovery and utilization of methane from landfills;
- To accelerate the construction of low-carbon communities in both urban and rural areas, promoting the construction of green buildings and the application of renewable energy in buildings, improving low-carbon supporting facilities for equipping communities and exploring modes of low-carbon community operation and management;
- To promote the share of green buildings in newly built buildings of cities and towns reaching 50% by 2020;

- To develop a green and low-carbon transportation system, optimizing means of transportation, properly allocating public transport resources in cities, giving priority to the development of public transportation and encouraging the development and use of low-carbon and environment-friendly means of transport, such as new energy vehicle and vessel;
- To improve the quality of gasoline and to promote new types of alternative fuels;
- To promote the share of public transport in motorized travel in big-and-medium-sized cities reaching 30% by 2020;
- To promote the development of dedicated transport system for pedestrians and bicycles in cities and to advocate green travel; and
- To accelerate the development of smart transport and green freight transport.

F. Increasing Carbon Sinks

- To vigorously enhance afforestation, promoting voluntary tree planting by all citizens, continuing the implementation of key ecological programs, including protecting natural forests, restoring forest and grassland from farmland, conducting sandification control for areas in vicinity of Beijing and Tianjin, planting shelter belt, controlling rocky desertification, conserving water and soil, strengthening forest tending and management and increasing the forest carbon sink;
- To strengthen forest disaster prevention and forest resource protection and to reduce deforestation-related emissions;
- To strengthen the protection and restoration of wetlands and to increase carbon storage capacity of wetlands; and
- To continue to restore grassland from grazing land, to promote mechanism of maintaining the balance between grass stock and livestock, to prevent grassland degradation, to restore vegetation of grassland, to enhance grassland

disaster prevention and farmland protection and to improve carbon storage of soil.

G. Promoting the Low-Carbon Way of Life

- To enhance education for all citizens on low-carbon way of life and consumption, to advocate green, low-carbon, healthy and civilized way of life and consumption patterns and to promote low-carbon consumption throughout society;
- To encourage public institutes to take the lead to: advocate low-carbon government buildings, campuses, hospitals, stadiums and military camps, advocate moderate consumption, encourage the use of low-carbon products and curb extravagance and waste; and
- To improve waste separation and recycling system.

H. Enhancing Overall Climate Resilience

- To improve safe operation of infrastructure of water conservancy, transport and energy against climate change;
- To properly develop and optimize the allocation of water resources, implementing the strictest water management regulation, building water-saving society in all aspects and intensifying the development and utilization of unconventional water resources, including recycled water, desalinated sea water and rain and flood water;
- To improve the construction of water conservation facilities for farmlands, to vigorously develop water-saving agricultural irrigation and to cultivate heat-resistant and drought-resistant crops;
- To enhance resistance to marine disasters and management of coastal zones and to improve the resilience of coastal areas against climatic disasters;
- To track, monitor and assess the impact of climate change on biodiversity;
- To strengthen the construction of forestry infrastructure;

- To properly lay out functional zones in cities, to make overall arrangements in developing infrastructure and to effectively safeguard city lifeline system;
- To formulate contingency plan for public health under the impacts of climate change and to improve the capacity of public medical services to adapt to climate change;
- To strengthen comprehensive assessment and risk management of climate change and to improve the national monitoring, early warning and communication system on climate change;
- To take full consideration of climate change in the planning, engineering and construction of the distribution of productive forces, infrastructures and major projects;
- To improve the emergency response mechanism for extreme weather and climatic events; and
- To strengthen the development of disaster reduction and relief management system.

I. Innovating Low-Carbon Development Growth Pattern

- To advance low-carbon pilots in provinces and cities;
- To conduct low-carbon cities (towns) pilots as well as low-carbon industrial parks, low-carbon communities, low-carbon business and low-carbon transport pilots;
- To explore diversified patterns of low-carbon growth;
- To research on effective approaches to control carbon emissions in different regions and cities;
- To facilitate the emerging of low-carbon cities with rational space distribution, intensive utilization of resources, low-carbon and efficient production and livable green environment; and

- To research on and establish carbon emission accreditation and low-carbon honor system, to carry out low-carbon certification pilots and promotion of selected products.

J. Enhancing Support in terms of Science and Technology

- To improve the fundamental research into climate change, conducting research on climate change monitoring and forecasting and strengthening research on the mechanisms and assessment methodology of climate change impacts and risks;
- To strengthen research and development (R&D) and commercialization demonstration for low-carbon technologies, such as energy conservation, renewable energy, advanced nuclear power technologies and carbon capture, utilization and storage and to promote the technologies of utilizing carbon dioxide to enhance oil recovery and coal-bed methane recovery;
- To conduct R&D on early warning systems for extreme weather;
- To develop technologies on biological nitrogen fixation, green pest and disease prevention and control and protected agriculture;
- To strengthen R&D on technologies for water saving and desalination of sea water; and
- To improve the technical supporting system for addressing climate change, to establish a mechanism that effectively integrates government, industries and academic and research institutes and to strengthen professional personnel training for addressing climate change.

K. Increasing Financial and Policy Support

- To further increase budgetary support;
- To actively innovate the application of funds and explore new investment and financing mechanisms for low-carbon development, such as public-private partnerships;

- To implement preferential taxation policies for promoting the development of new energy and to improve mechanisms of pricing, grid access and procurement mechanisms for solar, wind and hydro power;
- To improve green government procurement policy systems including that on procurement of low-carbon and energy-conservation products;
- To advance the reform in the pricing and taxation regime for energy-and-resource-based products;
- To improve the green credit mechanisms, to encourage and guide financial institutions to operate energy-efficiency crediting business and to issue asset-securitized products for green credit assets; and
- To improve disaster insurance policy against climate change.

L. Promoting Carbon Emission Trading Market

- To build on carbon emission trading pilots, steadily implementing a nationwide carbon emission trading system and gradually establishing the carbon emission trading mechanism so as to make the market play the decisive role in resource allocation; and
- To develop mechanisms for the reporting, verifying and certificating of carbon emissions and to improve rules and regulations for carbon emission trading to ensure openness, fairness and justice in the operation of the carbon emission trading market.

M. Improving Statistical and Accounting System for GHG Emissions

- To further strengthen the work on statistics of climate change;
- To improve greenhouse gas emission statistics covering areas including energy activity, industrial process, agriculture, land-use change, forestry and waste treatment;
- To improve the statistical indicator systems for climate change, to strengthen personnel training and to constantly improve the quality of data;

- To strengthen the work on greenhouse gas emission inventory accounting;
- To prepare greenhouse gas inventories at the national and provincial level on a regular basis;
- To establish a greenhouse gas emission reporting mechanism for key enterprises;
- To formulate greenhouse gas emission accounting standards for enterprises in key sectors; and
- To build a fundamental statistics and accounting system for greenhouse gas emissions at national, subnational and enterprise levels.

N. Broad Participation of Stakeholders

- To enhance the responsibility of enterprises for low-carbon development and to encourage them to explore low-carbon development modes that are resource-saving and environment-friendly;
- To strengthen the role of public supervision and participation in low-carbon development;
- To use platforms such as National Low Carbon Day to raise public awareness of low-carbon development throughout society;
- To encourage voluntary actions of the public to combat climate change;
- To let media play the role of supervision and guidance; and
- To enhance related education and training and to fully utilize the function of schools, communities and civil organizations.

O. Promoting International Cooperation on Climate Change

As a responsible developing country, China will stand for the common interests of all humanity and actively engage in international cooperation to build an equitable global climate governance regime that is cooperative and beneficial to all. Together with other Parties, China will promote global green low-carbon transformation and development path innovation. China will adhere to the

principles of equity and common but differentiated responsibilities and respective capabilities and urge developed countries to fulfill their obligations under the Convention to take the lead in substantially reducing their emissions and to provide support of finance, technology and capacity building to developing countries, allowing developing countries more equitable access to sustainable development and more support of finance, technology and capacity building and promoting cooperation between developed and developing countries. China will take on international commitments that match its national circumstances, current development stage and actual capabilities by enhancing mitigation and adaptation actions and further strengthening south-south cooperation on climate change. It will establish the Fund for South-South Cooperation on Climate Change, providing assistance and support, within its means, to other developing countries including the small island developing countries, the least developed countries and African countries to address climate change. China will thereby promote mutual learning, mutual support and mutual benefits as well as win-win cooperation with other developing countries. China will engage in extensive international dialogue and exchanges on addressing climate change, enhance policy coordination and concrete cooperation in related areas, share positive experiences and good practice, promote climate friendly technologies and work together with all Parties to build a beautiful homeland for all human beings.

III. CONTRIBUTIONS TO 2015 AGREEMENT NEGOTIATION

China is committed to the full, effective and sustained implementation of the Convention and to working with other Parties to achieve a comprehensive, balanced and ambitious agreement at the Paris Conference. In this connection, China submits its views regarding the process and outcome of the 2015 agreement negotiation as follows:

A. General View

The negotiation on the 2015 agreement shall be under the Convention and guided by its principles, aiming at enhancing the full, effective and sustained implementation of the Convention in order to achieve the objective of the Convention. The outcomes of negotiation shall be in accordance with the principles of equity and common but differentiated responsibilities and respective capabilities, taking into account differentiated historical responsibilities and distinct national circumstances, development stages and the capabilities of developed and developing countries. It should reflect all elements in a comprehensive and balanced way, including mitigation, adaptation, finance, technology development and transfer, capacity building and transparency of action and support. The negotiation process should be open, transparent, inclusive, Party-driven and consensus-based.

B. Mitigation

The 2015 agreement shall stipulate that the Parties, in accordance with the provisions of the Convention, shall formulate and implement programs and measures to reduce or limit greenhouse gas emissions for the period 2020-2030 and promote international cooperation on mitigation. Developed countries shall, in accordance with their historical responsibilities, undertake ambitious economy-wide absolute quantified emissions reduction targets by 2030. Developing countries shall, in the context of sustainable development and supported and enabled by the provision of finance, technology and capacity building by developed countries, undertake diversifying enhanced mitigation actions.

C. Adaptation

The 2015 agreement shall stipulate that the Parties shall, in accordance with the provisions of the Convention, strengthen international cooperation on adaptation

as well as the implementation of adaptation plans and projects at both regional and national levels. Developed countries shall provide support for developing countries to formulate and implement national adaptation plans as well as other related projects. Developing countries will identify their adaptation needs and challenges in their national adaptation plans and take enhanced actions. A subsidiary body on adaptation to climate change should be established. The linkage between adaptation and finance, technology and capacity building shall be strengthened. The Warsaw International Mechanism on Loss and Damage shall also be strengthened.

D. Finance

The 2015 agreement shall stipulate that developed countries shall, in accordance with the provisions of the Convention, provide new, additional, adequate, predictable and sustained financial support to developing countries for their enhanced actions. It shall provide for quantified financing targets and a roadmap to achieve them. The scale of financing should increase yearly starting from 100 billion U.S. dollars per year from 2020 which shall primarily come from public finance. The role of the Green Climate Fund (GCF) as an important operating entity of the financial mechanism of the Convention shall be strengthened. The GCF shall be under the authority of, guided by and accountable to the Conference of the Parties to the Convention.

E. Technology Development and Transfer

The 2015 agreement shall stipulate that developed countries shall, in accordance with the provisions of the Convention, transfer technologies and provide support for the research, development and application of technologies to developing countries based on their technology needs. The function of the existing technology mechanism shall be strengthened to help address the intellectual property right issue and assess technology transfer performance, and its linkage with the

financial mechanism shall be enhanced, including creating a window for technology development and transfer in the GCF.

F. Capacity Building

The 2015 agreement shall stipulate that developed countries shall, in accordance with the provisions of the Convention, provide support to developing countries in capacity building in all areas. An international mechanism on capacity building shall be established to develop and implement action plans for capacity building and to enhance capacity building for climate change mitigation and adaptation in developing countries.

G. Transparency of Action and Support

The 2015 agreement shall stipulate that the Parties shall, in accordance with the provisions of the Convention and relevant COP decisions, improve the transparency of enhanced actions of all Parties. Developed countries shall, in accordance with the provisions of the Convention as well as relevant provisions of the Kyoto Protocol, enhance the transparency of their actions through existing reporting and review systems. Rules on enhancing the transparency of finance, technology and capacity-building support by developed countries as well as the relevant review shall further be elaborated. Developing countries shall, with support by developed countries in terms of finance, technology and capacity building, enhance the transparency of their enhanced actions through existing arrangements on transparency and in a way that is non-intrusive, non-punitive and respecting national sovereignty.

H. Legal Form

The 2015 agreement shall be a legally binding agreement implementing the Convention. It can take the form of a core agreement plus COP decisions, with mitigation, adaptation, finance, technology development and transfer, capacity

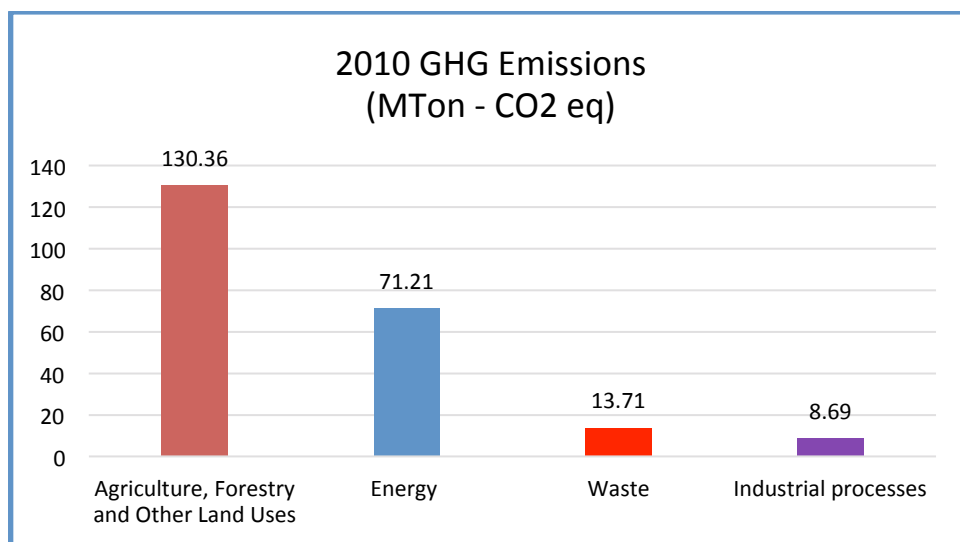
building and transparency of action and support being reflected in a balanced manner in the core agreement and relevant technical details and procedural rules being elaborated in COP decisions. The nationally determined contributions by developed and developing countries can be listed respectively and separately in the Paris outcome.

Pursuant to decisions 1/CP.19 and 1/CP.20 of the United Nations Framework Convention on Climate Change (UNFCCC), the Republic of Colombia is pleased to present its “Intended Nationally Determined Contribution” (iNDC).

INTRODUCTION

Colombia is committed to fighting climate change, to the success of the UNFCCC negotiations and, particularly, to the adoption in December 2015, of a new legally binding agreement that will include commitments for all Parties during the COP 21.

According to the information generated by the Colombian Hydrology, Meteorology and Environmental Studies Institute (IDEAM), in the context of the country’s First Biennial Update Report¹ and the Third National Communication on Climate Change, in 2010 the country produced estimated greenhouse gas emissions (GHG) of 224 Mton of CO₂eq, which represents just 0.46% of total global emissions for 2010². The sectorial distribution of GHG in Colombia is as follows:



Source: Colombian Biennial Update Report, IDEAM 2015

Notwithstanding the above, Colombia is highly exposed and sensitive to the impacts of climate change, given its diverse geography and economy, which is highly dependent on the climatic conditions and the use of natural resources.

The “New Climate Economy”, report led by the Global Commission on Economy and Climate, acknowledges that the current development rate is only sustainable if climate change risks are identified and faced. Therefore, for Colombia to develop and ensure its peace, equity and education objectives, and to sustain them in the long term, it is essential to identify and utilize, opportunities to increase

¹ The First Biennial Update Report is being consolidated and will be submitted to the Framework Convention of the United Nations in September 2015.

² Estimate made from an approximate data of global emissions of 49Gton according to the Fifth Assessment Report of the IPCC, Work Group III.

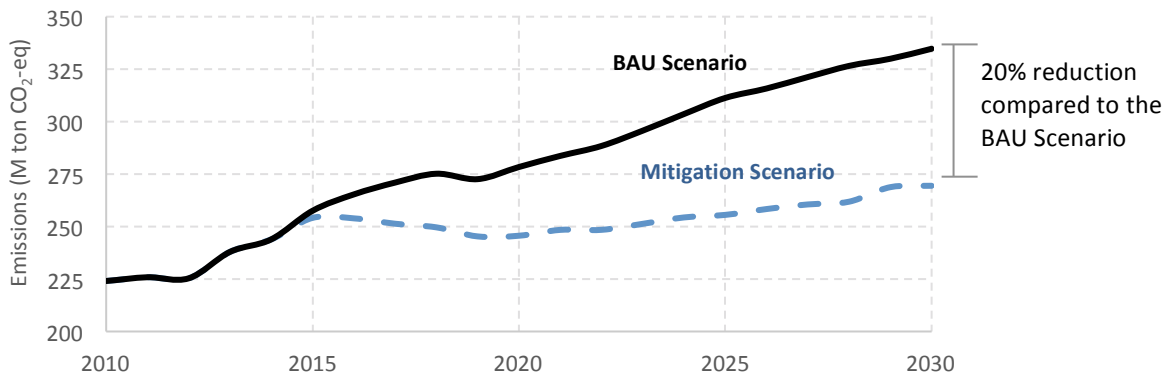
competitiveness, productivity and efficiency following a low-carbon pathway in the different sectors of the national economy. Likewise, it is important for the country to adapt to the impacts of climate change and build its development on a resilient foundation.

Therefore, Colombia deems it is fundamental for its INDC to consider not only mitigation but also adaptation and means of implementation. For the country, the consolidation of its INDC constitutes an opportunity to catalyze national and sub-national efforts through the planning of an innovative, competitive and low-carbon economy, which is resilient at same time.

MITIGATION

Unilateral and unconditional target

The Republic of Colombia commits to reduce its greenhouse gas emissions by 20% with respect to the projected Business-as-Usual Scenario (BAU) by 2030.



Conditional Target

Subject to the provision of international support, Colombia could increase its ambition from 20% reduction with respect to BAU to 30% with respect to BAU by 2030.

Type of target

Deviation with respect to a projected BAU scenario

Timeframe

- 2030
- Based on the outcome of the climate negotiations in Paris in the COP 21, Colombia will consider communicating an indicative target for 2025, consistent with its 2030 target.

Scope

- Economy-wide target
- It covers 100% of national emissions, according to the 2010 National Greenhouse Gas Inventory (INGEI 2010)
- It includes the 6 gases acknowledged by the Kyoto protocol: CO₂, CH₄, N₂O, HFCs, PFCs, SF₆
- It covers all emission sectors acknowledged by the Intergovernmental Panel on Climate Change (IPCC)

- It covers the entire national territory

Reference Level

The reference level is the *projected BAU scenario*. This scenario was developed in 2015, starting from the quantified inventory of GHG emissions in 2010 and includes the following emissions pathway:

- 2010: 224 Mton of CO₂eq
- 2020: 278 Mton of CO₂eq
- 2030: 335 Mton of CO₂eq

Assumptions and methodological approaches

- **The National Greenhouse Gas Inventory** for 2010 was prepared by IDEAM in the context of the First Biennial Update Report and the Third National Communication on Climate Change, according to the IPCC 2006 Guidelines.
- **The Global Warming Potential (GWP) values** used correspond to the Second Assessment Report of the IPCC (1995) for a 100-year period.
- **The AFOLU sector (agriculture, forestry and other land uses)**³ is included in the economy-wide target. The country has significantly improved the information for the characterization and quantification of emissions and removals in this sector, and will continue undertaking efforts to obtain better activity data, emission factors and projections. These efforts may lead to fine-tuning this information, i.e. in agro-forestry and silvopastoral systems, which offer great mitigation potential in the country.
To estimate the BAU and emissions reductions scenarios, the carbon emission and removals from forest plantations and permanent crops are included; it excludes removals from natural forests that still remain as natural forests⁴.
- The **BAU scenario** includes efforts to increase energy efficiency in the industrial, residential and commercial sectors, fugitive emissions due to the deceleration of oil and coal production, and deforestation trends under post-conflict scenarios.
- The **BAU scenario projections** were independently made for each of the productive sectors, using the input of experts, based on macroeconomic assumptions, the analysis of current and prospective policies, and official information from IDEAM regarding the historical path of emissions.
The information on deforestation was projected taking into account the 2013 -2017 Forest Reference Emissions Level for the Amazon region presented to the UNFCCC in December 2014. An aggregated analysis was then made to estimate the sectorial emissions projection at a national scale.
- The **emission growth drivers** at a sectorial level correlate to the following macro-economic variables:
 - Urban, rural or aggregated population: projections of the National Statistics Administrative Department (DANE) for 2020⁵ and extrapolation up to 2050. The

³ For the analysis of land cover changes, Approach 2 was employed: *Total Land-Use Area, Including changes between categories*. For other land cover representations Approach 1 was employed: *Total Land Use Area, no data on conversions between land uses*, or a combination of both approaches. (IPCC 2006, Vol 4, Cap 3).

⁴ The above will be subjected to the progress on the definition of accounting rules under the United Nations Framework Convention on Climate Change.

population distribution between rural and urban areas was estimated with UN methodologies⁶, based on the DANE projections for 2020.

- ii. Gross Domestic Product (GDP): For the sectorial GDP projections, the Dynamic Product Input was used with adjustments in the model that allowed for modification of the contribution of the oil and coal sectors to national GDP, which affected the behavior of other sectors.

The growth expectation of each sector was reviewed with the National Planning Department (DNP) and other experts to define highly likely scenarios for Colombia up to 2050, using an average growth in per capita GDP of 3.1% per year. Furthermore, the government analyzed historical trajectories and current and prospective policies of the activity data.

Market instruments

With the objective of contributing to achieve the emissions reduction target, with a focus on cost-efficiency, Colombia will explore the use of market instruments (or other economic instruments) that guarantee the principles of transparency and environmental integrity, which result in real, permanent, additional, verified mitigation outcomes and prevent double counting.

Preparation of Goal

Since 2012, within the framework of the Colombian Low-Carbon Development Strategy, analyses were performed with high technical rigor⁷ to explore trajectories to decouple GHG emissions growth from national economic growth. These analyses included: dialogues with experts from public and private entities, academia, and civil society, with a view to identify and prioritize mitigation measures that were aligned with sectorial development objectives. These exercises and collective agreements formed the basis for developing the BAU and mitigation scenarios, which resulted in the national emission reduction target.

After this technical process, the government carried out a political process that included the participation of high-level public actors (Ministers and Vice Ministers). Workshops and bilateral meetings were held between the Ministry of the Environment and Sustainable Development, sectorial Ministries and the National Planning Department.

ADAPTATION

The Colombian territory is characterized by a great diversity of ecosystems, determined by its geographical location and the physical and climatic characteristics of a country that has three mountain ranges, six natural regions and a large cultural diversity shaping the dynamics of numerous local communities. This, added to a climate-dependent economy, makes the country highly vulnerable and sensitive to adverse impacts from climate change. The “La Niña” phenomenon, which took place in 2010-2011, evidenced the impacts derived from climate change and variability on the country’s development. Damage and losses were estimated in USD\$ 6 billion⁸, over 3.2 million people were affected, 3.5 million

⁵ Available at <http://www.dane.gov.co/index.php/poblacion-y-demografia/proyecciones-de-poblacion>

⁶ United Nations, methods for urban and rural population projections. Manual VIII, ST/ESA/SER.A/55. New York, 1975.

⁷ The analyses performed based on inclusive methodologies, based on the science of the MAPS Platform.

⁸ DNP-IDB-ECLAC. 2011. “Valuation and losses from winter season 2010-2011 (“La Niña”) in Colombia. Average exchange rate of \$1.856 COP per dollar between October 2010 and May 2011

hectares flooded and 845 primary and secondary roads closed, thus affecting the social and economic life of the country.

Adaptation and building resilience with respect to climate change are a priority for Colombia and represent a national security issue, which in the context of peace building will be even more relevant. These measures will be aimed at improving the well being of the entire population in territories well adapted to the climate, all of which will make Colombia a modern, innovative and competitive country globally.

Adaptation priorities in the context of the INDC

The adaptation component is based on the country's progress regarding adaptation within the National Adaptation Plan to Climate Change (PNACC in Spanish), which was formulated in 2011, and has been implemented through different territorial and sectorial efforts. The PNACC defines guidelines so that the country's sectors and territories prioritize their actions aimed at reducing vulnerability, and include climate change and climate variability in their planning processes, through the formulation and implementation of territorial and sectorial adaptation plans. These efforts have focused on the Caribbean and Andean regions, as well as on the transport, housing, energy, agriculture and health sectors, as defined based on the information provided by the First and Second National Communications on Climate Change, and taking into account the damages and losses caused by La Niña phenomena in 2010-2011.

To date, Colombian entities have formulated 11 territorial adaptation plans to climate change, which have prioritized adaptation actions. These plans are the input for decision-makers to identify the vulnerability of the territory and define adaptation measures to be incorporated in the different development and spatial planning instruments. Furthermore, prioritized sectors corresponding to each Ministry are making progress in developing their sectorial adaptation plans. To date, there are plans for the agricultural sector and the primary road network.

The preparation of the Third National Communication on Climate Change is ongoing, and its input will provide updated information in greater detail, which will identify the areas of greatest vulnerability, with a view to prioritize and concentrate adaptation efforts.

Colombia's adaptation action towards Paris Agreement

Starting with the country's progress through the PNACC and in line with efforts to address multidimensional poverty and inequality, the definition of the adaptation component of the INDC included a participatory methodology, through workshops, working sessions and opportunities for dialog with experts from public and private entities, academia, and civil society.

It was defined that the country will focus its efforts to 2030 jointly with other global targets that contribute to increasing resilience, such as those of the Convention on Biological Diversity (CBD), the 2030 Development Agenda, and the UN Convention to Combat Desertification (UNCCD), as well as the Sendai Framework for Disaster Risk Reduction 2015-2030, in the following strategic lines:

- i. Synergies between adaptation and mitigation

- ii. Socio-ecosystem based adaptation
- iii. Articulation between adaptation to climate change and risk management
- iv. Adaptation of infrastructure and economic sectors of the economy
- v. Incorporation of adaptation and resilience considerations in sectorial, spatial and development planning
- vi. Strengthening of institutional capacities
- vii. Promotion of education about climate change to catalyze behavioral changes
- viii. Consolidation of peace territories taking into account climate change considerations

In this sense, and with a view to move towards economies, societies and ecosystems resilient to climate change impacts, the following are the specific prioritized actions by 2030 in Colombia:

- i. 100% of the national territory covered by climate change plans formulated and being implemented
- ii. A National System of Adaptation Indicators that allows the monitoring and evaluation of the implementation of adaptation measures
- iii. Water resource management tools, which include climate change and variability considerations, will be in place for the country's priority water basins
- iv. Six (6) priority sectors of the economy (transport, energy, agriculture, housing, health, and trade, tourism and industry) will include climate change considerations in their planning instruments and will be implementing innovative adaptation actions
- v. Strengthening of the awareness, training and public education strategy on climate change, focusing on different stakeholders of the Colombian society
- vi. Delimitation and protection Colombia's 36 "*paramo*" areas (high mountain Andean ecosystems) (approximately 3 million hectares).
- vii. Increase of more than 2.5 million hectares in coverage of newly protected areas in the National System of Protected Areas -SINAP-, in coordination with local and regional stakeholders
- viii. Inclusion of climate change considerations in projects of national and strategic interest -PINES-.
- ix. 10 subsectors of the agricultural sector such as rice, coffee, livestock and silvopastoral, with improved capabilities to adapt appropriately to climate change and variability.
- x. 15 of the country's departments participating in the technical working groups on climate and agriculture, articulated with the national working group and 1 million producers receiving agro-climatic information to facilitate decision-making in agricultural activities.

MEANS OF IMPLEMENTATION

Colombia will contribute to the achievement of the global mitigation and adaptation goals and targets through plans, programs and initiatives that will facilitate the implementation of the necessary measures to achieve the INDC goals.

In this sense, Colombia will work towards:

- i. A strategy with universities networks and research groups on subjects related to the main goals proposed as part of the mitigation and adaptation contributions.

- ii. The creation of climate change innovation clusters, through the promotion of private investment, public private partnerships and foreign direct investment, with special emphasis on the scientific research and the knowledge and technology transfer.
- iii. An agenda which would promote research, innovation and technological development in topics related to climate change.
- iv. The active integration of national institutes and entities with the relevant UNFCCC mechanisms for technology transfer.
- v. Share valuable knowledge with developing countries as part of its iNDC, regarding mitigation and adaptation to climate change, to the extent of the country's capabilities and responding in particular to the Latin America and Caribbean region's demands. This commitment aims at scaling up Colombia's south-south and triangular cooperation in this area, under the leadership of the organizations coordinating international cooperation in the country.
- vi. Articulation of the National Government, with regional and local governments for the formulation and implementation in the medium and long-term, of comprehensive climate change plans that foster competitive and sustainable cities.
- vii. Continue to work together with the financial sector in order to contribute to the continuous improvement and development of solutions to the environmental and social challenges that the country faces. Colombia will continue to do so through joint actions between civil society, state and the private sector to achieve a sustainable development and the transition to low-carbon, resilient development.

Finally, Colombia has been making progress in the identification of financing sources and the definition of a climate-finance strategy. However, it is recognized that financial resources are limited, which is why there is a need to increase the resources for financing adaptation and mitigation, as well as the development and transfer of technologies and the construction of institutional capacity at the different government levels.

PLANNING PROCESS

Since 2010, Colombia has been developing policy instruments for climate, such as the Policy Document CONPES 3700, the Colombian Low Carbon Development Strategy (CLCDS), the National Strategy for Reducing Emissions from Deforestation and Forest Degradation (ENREDD +) and the National Adaptation Plan for Climate Change.

Additionally, since 2014, Colombia is formulating its National Climate Change Policy that aims to establish, in an articulated manner, mitigation and adaptation actions in the country by increasing resilience and reducing the carbon intensity in the economy.

In this sense, the National Development Plan (NDP) 2014-2018 includes a Green Growth strategy that indicates that "the climate change policy and draft bill, will be harmonized with the definition of a commitment on emissions reduction, adaptation and means of implementation that meets the criteria of robustness and fairness. This commitment will be submitted by Colombia under the global agreement that is being negotiated under the UNFCCC ". Thus, these instruments allow the incorporation of climate change management in making development decisions in the medium and long term, and facilitate compliance with the objectives laid down in this iNDC.

Colombia's iNDC seeks to give greater participation to the territories and sectors at the local level to prioritize and design their own climate change strategies, with a differentiated approach that takes into account regional circumstances. This aims at reconciling "bottom-up" and "top-down" strategies with a view to establishing enhanced coordination and participation of different stakeholders at the different government levels and links in the value chains of the different sectors.

To fulfill its mitigation goal, Colombia has prioritized mitigation measures through (8) Sectorial Mitigation Action Plans (SMAPs) that aim to maximize the carbon-efficiency of economic activities at the national and sectorial levels and in turn contribute to social and economic development. These plans were developed under the CLCDS framework and were approved by the relevant sectorial Ministries (Agriculture and Rural Development, Commerce, Industry and Tourism, Transport, Housing, City and Territory and Mines and Energy). Mitigation measures have also been identified in the land use change sector, with processes under the REDD + Strategy and the Amazon Vision Program, among others.

Since 2013 the country has been working on developing a system for monitoring, reporting and verification for GHG emission reductions and climate financing. To this date, we have advanced in defining the objectives, mitigation measures and principles of the system. The country is committed to continue working in this direction, especially in identifying and developing legal, technical and institutional tools to facilitate monitoring progress towards achieving the iNDC.

EQUITY AND AMBITION

Colombia's iNDC is realistic, ambitious and equitable. It is based on national progress to date, takes into account national capacities and circumstances, and seeks to contribute to the objective of the Convention (established in Article 2).

Emissions Profile in Colombia

Colombia has a very clean electricity generation matrix due to the high share of hydroelectricity (68% of the electricity generation in 2010) and an energy consumption well below the international electricity consumption averages. Energy consumption in Colombia in 2010 was 31 MBTU per person, while the world average in the same year was 74 and Latin America's was 57 MBTU per person, according to the information from the *US Energy Information Administration*.

Colombia's mitigation target seeks to achieve a per capita emissions level of nearly 4.6 Ton CO₂eq/capita by 2030. This value would be even lower than the country's per capita emissions in 2010 (4.8 Ton CO₂eq/capita) and is consistent with the pathway established by the United Nations Environment Program (*Emissions Gap Report*, 2014) which encourages countries to achieve the goal of avoiding a global temperature rise of more than 2° C.

	BAU	iNDC
Total estimated emissions in 2030 (Mton CO ₂ eq)	335	268
Estimated per capita emissions in 2030 (Ton CO ₂ eq/capita)	5.8	4.6

Given the significant share of AFOLU emissions (emissions associated with livestock sub-sectors, agriculture, forestry and other land use) in the national emissions profile (about 58% of the total), Colombia reaffirms its commitment to reduce deforestation in the country and to preserve important

ecosystems such as the Amazon region, given its huge potential to contribute to the stabilization of greenhouse gases in the atmosphere.

National Circumstances

Colombia is a middle income country. However, Colombia is a developing country that has important social, economic and environmental challenges ahead, as mentioned below. Among these challenges it is worth mentioning that the country is highly vulnerable to climate change.

Considering both the capabilities and the development challenges that the country faces, Colombia proposes an iNDC that is ambitious and equitable.

Building Peace

Building peace in Colombia presents economic, social and environmental challenges for the country. Some of these challenges can be addressed through actions that at the same time have a potential to contribute to mitigation and adaptation to climate change. In the past, peace processes elsewhere in the world have been associated to negative impacts on the environment, due to, among other things, migration patterns that increase pressure on natural resources in the most vulnerable areas, often resulting in increased deforestation. These potential impacts have been taken into account in post-conflict scenarios in different regions.

Adaptation measures aiming at planning a rational use of ecosystem services that have been prioritized, such as water resources, allow for a better management and use of those resources and ensure the dynamics of supply and demand in the country. To include a climate change component in territories and sectors planning instruments, increases the adaptation capacity of the country, and in addition, contributes to increased resilience in face of events that may affect national development objectives.

Thus, mitigation and adaptation to climate change have the potential to facilitate the consolidation of peace territories where productive activities and land uses can, in a more equitable manner and with greater ownership of the territory, play a key role providing better development opportunities, in particular in rural communities.

Overcoming Poverty

Colombia, as a developing country, faces major socioeconomic challenges. According to the official figures of DANE, by 2014, the percentage of people in multidimensional poverty situation was 21.9% (this figure rises to 44.1% if we take into account only the rural population). For the same year, 28.5% of the population was found in a situation of monetary poverty (41.4% of the population in the case of the villages and rural centers scattered). It is clear that despite its progress, Colombia still faces major challenges in terms of overcoming poverty and inequality.

Structuring a resilient and low-carbon economy is aligned with national development priorities including overcoming poverty in all its dimensions. Therefore, the country, as it has been doing in recent years, intends to actively participate in an ambitious and equitable way in the global efforts under the UNFCCC, taking into account the recommendations of the IPCC's Fifth Assessment Report.

Towards a Resilient Development

According to the National Unit for Disasters Risk Management, from 1998 to 2012, 90% of emergencies in Colombia were related to hydro-climatological phenomenon. Therefore, it is a priority to articulate the mitigation processes and efforts to be performed, including through the identification of potential co-benefits and synergies with adaptation, in order to move towards resilient and sustainable climate scenarios. Mitigation actions reduce the risk of loss and damage as well as future adaptation costs; while adaptation measures have co-benefits in reducing emissions.

Colombia assumes its INDC as an opportunity to strengthen and build on the work done in the sectors and territories both in mitigation and adaptation to climate change. This will contribute to formulate policies, programs, plans and projects in an articulated way between the different productive sectors, public and private entities, non-governmental organizations and civil society in general.

Union des Comores
Unité - Solidarité - Développement



**Ministère de la Production, de l'Environnement,
de l'Energie, de l'Industrie et de l'Artisanat**

**Contributions Prévues Déterminées au
niveau National de l'Union des Comores**

Septembre 2015

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Résumé exécutif

La Contribution Prévue Déterminée au niveau National (CPDN) de l'Union des Comores s'est appuyée sur sa Stratégie de Croissance Accélérée et de Développement Durable (SCA2D) ainsi que ses différents programmes de Gestion des Changements Climatiques dont l'objectif global est de contribuer à la réduction de la pauvreté, au développement durable tout en apportant des solutions adéquates aux défis liés aux changements climatiques.

Ce fut le résultat d'un processus de concertation des différentes parties prenantes qui ont passé en revue tous les programmes, plans d'action et projets relatifs à la lutte contre le changement climatique. Ce processus a été consacré par les autorités nationales à travers la tenue d'un atelier national du 27-28 juillet 2015 présidé par la Ministre en charge de l'environnement.

L'Union des Comores, en décidant de réduire ses émissions de gaz à effet de serre (GES), est consciente de s'engager, d'une part, à produire des actions laborieuses d'atténuation des GES pour l'atteinte de cet objectif malgré le manque de capacité, et d'autre part, à développer des actions d'adaptation aux effets négatifs des changements climatiques. Ces actions s'appuient sur des stratégies et des plans d'action sectoriels touchant notamment les domaines de l'agriculture, des déchets, des forêts, de l'Utilisation des terres, changement d'affectation des terres et foresterie (UTCAF) et de l'énergie.

Ainsi malgré sa faible contribution aux gaz à effet de serre, l'Union des Comores veut poursuivre l'objectif qu'elle s'est fixé d'être un puits de carbone et participer ainsi à l'effort global de décarbonisation de la planète.

L'ambition de l'Union des Comores est de réduire ses émissions de GES en 2030 de 84% environ par rapport aux émissions projetées pour la même année selon un scénario de référence. Cet engagement ne pourrait être atteint qu'avec l'accompagnement de la communauté internationale pour permettre à l'Union des Comores d'accéder à des sources de financement additionnelles notamment grâce aux nouveaux mécanismes de la finance climat, ou le Fonds Vert pour le Climat. Cet objectif qui correspond à une réduction de 441 700 tonnes métriques de CO₂éq., incluant les activités du secteur UTCAF à l'horizon 2030, nécessite un investissement total d'environ 675 millions US\$ dont une proportion d'environ 10% pourrait provenir du budget national.

Compte tenu du manque de données, la CPDN de l'Union des Comores est appelée à évoluer avec la mise en place d'un système amélioré de collecte et de traitement de données plus performant.

Section 1. Contexte national

Petit état insulaire de 750 000 habitants, l'Union des Comores est particulièrement vulnérable au changement climatique, comme les autres petits états insulaires en développement (PEID). Les principaux aléas impactant l'Union des Comores sont: l'augmentation de la température; l'élévation du niveau de la mer (érosion et submersion); les cyclones tropicaux plus intenses, la modification du régime des précipitations; la modification du régime des vents; l'acidification des océans et la modification des cycles fondamentaux.

Par ailleurs, l'économie de l'Union des Comores est fortement dépendante de l'agriculture qui représente environ 50% de son Produit Intérieur Brut (PIB) et la grande majorité de la population vit dans les zones côtières. Les effets des changements climatiques sont déjà très visibles et compromettent fortement les efforts de développement entrepris par l'Union des Comores au cours de cette dernière décennie. Sans mesures ambitieuses, le coût des impacts liés au climat pourrait s'élever à 836 millions US\$ d'ici 2050, représentant 130% du PIB actuel¹.

L'Union des Comores dont les émissions sont négligeables au niveau global, a fait des efforts au cours de cette dernière décennie pour développer un cadre politique et stratégique en vue d'une croissance durable et de développement vert, résiliente au climat et sobre en émission de carbone.

L'Union des Comores, en tant que signataire de la Convention des Nations Unies sur le Changement Climatique, tient à contribuer à l'effort international qui vise à combattre le réchauffement climatique. Les principales activités ont pour objectif d'augmenter la résilience des populations les plus vulnérables aux effets des changements climatiques tout en leur permettant d'améliorer leurs revenus et d'accéder à des technologies propres pour assurer leurs besoins de base (alimentation, santé, électricité).

Ainsi la Contribution Prévue Déterminée au niveau National (CPDN) de l'Union des Comores est guidée par la volonté de poursuivre l'objectif d'être un puits de carbone et de promouvoir un développement durable. Cette CPDN se base tout particulièrement sur le programme d'action national d'adaptation (PANA), le cadre de programmation stratégique sur l'environnement naturel, le changement climatique et la réduction des risques de catastrophes pour 2011-2016 et la stratégie de croissance accélérée et de développement durable (SCA2D) pour 2015-2019.

Malgré sa faible contribution aux émissions de Gaz à Effet de Serre (GES), l'Union des Comores veut poursuivre l'objectif qu'elle s'est fixée d'être un puits de carbone et participer ainsi à l'effort global de décarbonisation de la planète. Afin de réduire sa dépendance énergétique vis-à-vis de l'extérieur et satisfaire les besoins de ses populations les plus vulnérables, l'Union des Comores souhaiterait développer davantage ses perspectives en matière d'énergies renouvelables.

¹ UNDP, processus de plan national d'adaptation aux Comores, 2014.

Section 2. Atténuation

2.1 Contribution

L'Union des Comores s'engage à réduire ses émissions de gaz à effet de serre de 84% à l'horizon 2030 par rapport aux émissions du scénario de référence de la même année. Cette réduction inclut les absorptions du secteur Utilisation des Terres, Changement d'Affectation des terres et Foresterie (UTCAF) également.

La part des émissions de GES de l'Union des Comores au niveau global est infime mais le pays est prêt à apporter sa part dans l'atténuation et l'adaptation ainsi que des moyens de mise en œuvre.

Contribution en matière d'atténuation

<i>Scénario de référence</i>	> Projections des émissions nationales à l'horizon 2030 suivant le cours normal des affaires
<i>Année de référence</i>	> 2030
<i>Type de contribution</i>	> Réduction d'émissions par rapport à un scénario de référence couvrant trois des quatre îles faisant partie du territoire Comorien (Grande Comore, Anjouan et Mohéli)
<i>Niveau cible</i>	> L'Union des Comores s'est fixé comme cible une réduction de l'ordre de 440 000 tonnes métriques de CO ₂ eq., incluant les absorptions des activités du secteur UTCAF



- > L'Union des Comores compte sur le support de la contribution internationale à hauteur de 375 millions US\$, valeur de 2015, pour atteindre cet objectif, à travers le Fonds Vert pour le climat ou autres mécanismes de financement existants ou futurs.

Contribution en matière d'atténuation	
<i>Réduction de GES</i>	> L'Union des Comores s'est fixé comme cible une réduction de 84% en 2030 de ses émissions de gaz à effet de serre par rapport aux émissions du scénario de référence
<i>Secteurs couverts</i>	<ul style="list-style-type: none"> > Énergie <ul style="list-style-type: none"> > Industries énergétiques ; > Efficience énergétique ; > Catégorie manufacturière ; > Catégorie résidentielle. > Agriculture <ul style="list-style-type: none"> > Agriculture de conservation ; > Arboriculture ; > Agroforesterie. > UTCAF <ul style="list-style-type: none"> > Protection des forêts ; > Reboisement ; > Afforestation ; > Réduction de prélèvement de bois des forêts. > Déchets <ul style="list-style-type: none"> > Déchets solides ménagers.
<i>Gaz à effet de serre couverts</i>	<ul style="list-style-type: none"> > Dioxyde de carbone (CO₂) ; > Méthane (CH₄) ; > Oxyde nitreux (N₂O) ; > Les gaz fluorés ne comptent que pour une partie infime des émissions et leur élimination progressive est en cours depuis déjà plusieurs années.
<i>Paramètres appliqués</i>	<ul style="list-style-type: none"> > Valeurs potentielles du réchauffement global sur cent ans, tirées du deuxième rapport d'évaluation du GIEC <ul style="list-style-type: none"> > CO₂ : 1 ; > CH₄ : 21 ; > N₂O : 310.
<i>Méthode d'estimation des émissions</i>	<ul style="list-style-type: none"> > Lignes directrices 2006 du GIEC et le logiciel GIEC 2006 : <ul style="list-style-type: none"> > Le scénario cours normal des affaires (CNA) a été développé sur la base d'une série de mesures et d'actions au niveau des catégories et secteurs du GIEC. Les émissions, évitées ou absorbées, ont ensuite été agrégées pour donner le potentiel d'atténuation national ; > Toutes les projections ont été travaillées en prenant en compte la croissance démographique, l'augmentation du produit intérieur brut et autres facteurs sociaux et économiques spécifiques au pays.
<i>Approche concernant les émissions relatives à l'affectation des terres, les changements d'affectation et la foresterie</i>	<p>L'approche de comptabilisation retenue pour le secteur UTCAF concerne les émissions et absorptions provenant des changements d'affectation et de l'utilisation à l'intérieur et entre les six catégories de terre selon le GIEC. La ligne directrice et le logiciel du GIEC de 2006 ont été utilisés pour estimer les émissions. Les changements entre les catégories du GIEC ont été déterminés à partir des techniques de télédétection appuyées par la cartographie classique et autres moyens tels que l'inventaire de forêts pour suivre les variables déterminantes responsables des émissions et absorptions. Cette dernière série a trait à :</p> <ul style="list-style-type: none"> > La réduction de bois prélevé pour divers usages ; > Freiner le taux de déforestation ; > Une meilleure gestion des forêts ; > La préservation des aires protégées ; > La conservation des réserves forestières ; > L'agroforesterie ;

Contribution en matière d'atténuation

- > L'arboriculture ;
- > Le reboisement ;
- > Un meilleur contrôle des feux de forêts et des prairies.

2.1.1 Potentiel d'atténuation des mesures

Les secteurs phares pour l'atténuation sont l'UTCAF et l'Agriculture car les moyens sont assez restrictifs pour le secteur Energie sur la base des données et de la situation actuelle. Toutefois, la géothermie reste un atout et devrait recevoir le maximum d'attention afin d'être exploitée dans un avenir le plus proche possible. L'objectif national d'atténuation est d'atteindre 46% en 2020 pour transiter à 69% en 2025 et arriver à 84% en 2030.

Tableau 1. Potentiel d'atténuation nationale et sectorielle (tCO₂éq.)

Secteurs	Année		
	2020	2025	2030
CNA (scenario de référence)	357 800	434 500	523 000
Total atténuation	166 600	301 500	441 700
Énergie	18 400	29 500	53 200
Agriculture	26 000	57 000	85 000
UTCAF	117 800	210 000	298 000
Déchets	4 400	5 000	5 500
% (atténuation*100/Scénario de référence)	47	69	84

2.1.1.1 Approche

Une approche mixte, basée sur des mesures et actions pour les catégories et secteurs clés du GIEC, a été adoptée car celles-ci offrent les potentiels les plus élevés d'atténuation. En deuxième lieu, un exercice d'évaluation du potentiel de réussite a été entrepris sur base des circonstances nationales du pays afin de prioriser les meilleures potentialités. Les potentiels d'atténuation ont ainsi été déterminés pour chaque secteur d'activité priorisé et les valeurs obtenues ont ensuite été agrégées pour arriver à l'échelle nationale. Cette approche facilitera aussi la préparation d'un plan détaillé et précis pour la mise en œuvre, étant donné que les actions, à prendre en compte, ont déjà été identifiées.

2.1.1.2 Fondement ou Raisonnement

Les catégories industries énergétiques et résidentielles ont été choisies du fait que ce sont des sources clés et qui offrent aussi d'autres effets bénéfiques en sus de l'atténuation. Ainsi, l'accès à l'électricité, verte surtout, aiderait au développement du pays, à assurer une meilleure qualité de l'air et de l'environnement et, à diminuer la pression sur les forêts pour le bois. L'hydraulique et le solaire ont été privilégiés au détriment des hydrocarbures sans pour autant éliminer l'éolien tandis que la géothermie a été prise en considération à l'horizon 2030. L'électricité éolienne doit encore être étudiée avant d'avoir sa place dans le mix énergétique. Pendant la période 2010 à 2030, les énergies renouvelables évolueront de 3% environ à presque 43%, avec toutefois une production de la géothermie comptant pour 16% si l'opération se réalise. Les autres mesures concernent la maîtrise de l'énergie lors de la transformation et de la transmission, et l'efficacité énergétique à travers les foyers améliorés, les améliorations dans la carbonisation et les alambics entre autres.

Les impacts en termes de réduction des émissions pour ces derniers ont été comptabilisés sous le secteur Forêt parce qu'elles interviendront à travers une réduction du prélèvement de bois.

En ce qui concerne le secteur Agriculture, le mode d'élevage rend difficile l'atténuation dans le pas de temps considéré pour cet exercice. L'agriculture de conservation a été analysée mais les émissions qui pourraient être évitées n'ont pas été quantifiées car elles restent assez aléatoires.

La Forêt a été particulièrement ciblée car c'est le plus gros émetteur de GES et elle offre également une grande possibilité de séquestration dans le pays. Les mesures ciblées concernent la protection des espaces forestiers, la déforestation, le reboisement, l'afforestation, l'agroforesterie et l'arboriculture tout en investissant les efforts nécessaires pour réduire la consommation de bois provenant de forêts. Une approche holistique a été travaillée pour une foresterie durable et en prenant en considération les besoins de la population en bois pour ses besoins énergétiques et autres. Ainsi il est prévu de reboiser environ 12 000 ha pendant la période 2018 à 2030. La superficie sous agroforesterie et arboriculture évoluera à un rythme de 200 ha par an à partir de 2018 jusqu'en 2030. Les aires protégées existantes seront étendues pour atteindre 50 000 ha en 2030.

La CPDN prévoit de mettre en place une gestion améliorée des déchets solides ménagers à travers le compostage principalement. Le tableau ci-dessous résume les différentes mesures prises en compte et leur potentiel de réduction.

Tableau 2. Réductions de GES des mesures d'atténuation - horizon 2020, 2025 et 2030

Mesures atténuation	Potentiel de réductions de GES (tCO ₂ éq.)		
	Horizon 2020	Horizon 2025	Horizon 2030
Energie	18500	29500	41200
<i>Réduire les pertes sur le réseau de distribution électrique</i>	11 900	15 000	19 000
<i>Réhabiliter des centrales électriques</i>	1 600	2 000	2 500
<i>Adoption du solaire</i>	2 700	7 800	9 400
<i>Augmenter le potentiel hydro</i>	2 300	4 700	10 300
<i>Géothermie</i>	0	0	11 900
<i>Promouvoir l'utilisation du GPL à la place du pétrole et du bois</i>	6	11	12
<i>Promouvoir les foyers améliorés</i>	Comptabilise sous réduction bois de chauffe		
Agriculture			
<i>Promouvoir l'agriculture de conservation</i>	Pas de quantification		
UTCAF	143 800	267 000	383 000
<i>Réduction de la consommation du bois de feu, de service et industriel</i>	33 000	68 000	104 000

<i>Afforestation des prairies ou autres terres en friche</i>	39 000	78000	78 000
<i>Reboisement</i>		18 200	70 200
<i>Agroforesterie</i>	13 000	34 000	56 000
<i>Arboriculture</i>	13 000	23 000	29 000
<i>Aires Protégées (50000 ha)</i>	45 800	45 800	45 800
Déchets	4 400	5 000	5 500
<i>Compostage et Biogaz</i>	4 400	5 000	5 500

Section 3. Adaptation

3.1 Stratégie d'adaptation: vision à long terme

Le défi du développement des différentes îles se conjugue de plus en plus avec celui de l'adaptation aux changements climatiques. La durabilité de la croissance, sa sécurisation passera nécessairement par une meilleure prise en compte de la dimension adaptation aux changements climatiques.

Le Gouvernement est aussi conscient que les plus vulnérables aux effets du changement climatique sont les communautés rurales et les agriculteurs pauvres qui manquent trop souvent de capacités pour résister à ces impacts.

Il importera, entre autres, de: (i) rendre rigoureuse l'application de la réglementation en matière de restauration des zones dégradées, (ii) promouvoir l'agriculture intensive, (iii) accroître l'implication des femmes et des communautés dans les prises de décision en matière de protection de l'environnement compte tenu de leur rôle grandissant dans le développement de l'économie domestique; et (iv) développer la résilience des populations face aux catastrophes et aux changements climatiques.

Pour cela, le pays devra réussir à intégrer ces mesures d'adaptation aux changements climatiques dans les différentes politiques sectorielles, renforcer les capacités et enfin mobiliser des ressources financières suffisantes.

3.2 Actions en cours ou prévues à court terme

L'Union des Comores présente une très forte vulnérabilité aux changements climatiques due notamment à sa faible capacité d'adaptation. Dans un tel contexte, la lutte contre la pauvreté contribue à la lutte contre les changements climatiques en visant notamment la réduction de la vulnérabilité. De même, de nombreux projets de réduction de la vulnérabilité ont pour objectifs de réduire la pauvreté. Il est important que les acteurs soient sensibilisés sur ce lien à double sens entre réduction de la pauvreté et adaptation via la réduction de la vulnérabilité. En effet, cette limite très fine entre les deux approches, parfois indistincte, peut mener à une incompréhension quant à la signification réelle de l'adaptation par rapport à une stratégie classique de réduction de la pauvreté.

Aujourd'hui quatre projets majeurs d'adaptation aux changements climatiques sont en cours ou vont débiter et deux projets sont en développement. Ils ciblent les secteurs de l'Eau et de l'Agriculture ainsi que l'intégration de l'adaptation dans les politiques sectorielles (cf. Tableau 4).

Tableau 3. Principaux projets d'adaptation aux Comores

Projets	Secteur / Objectifs	État de mise en œuvre
<i>Renforcement des capacités et de résilience du secteur agricole aux changements climatiques aux Comores (CRCCA)</i>	Agriculture: Réduire la vulnérabilité des systèmes agricoles au changement climatique et à la variabilité climatique	En cours
<i>Renforcement des capacités de gestion des ressources en eau pour une adaptation aux changements climatiques (ACCE)</i>	Eau: réduire les risques liés au CC sur la vie quotidienne et les impacts sur les ressources en eau	En cours
<i>Programme d'Appui à l'Union de Comores pour le Renforcement de la Résilience au Changement Climatique (AMCCA)</i>	Intégration: améliorer la prise en compte du changement climatique dans les stratégies, projets et mécanismes de planification, coordination et suivi	En cours
<i>Programme conjoint adaptation eau</i>	Eau: réduire les risques liés au changement climatique sur la vie quotidienne et les impacts sur les ressources en eau sur 5 sites pilotes	En cours
<i>Réhabilitation des Bassins versants, des forêts et des moyens de subsistance adaptatifs</i>	Zones côtières: renforcer la résilience aux Comores en réhabilitant les bassins versants, les forêts et en diversifiant les moyens de subsistance	En développement
<i>Résilience face aux risques dus à la variabilité et aux changements climatiques</i>	Risques: renforcer l'adaptation et la résilience des capacités des communautés les plus vulnérables aux risques de catastrophes liées au changement et à la variabilité du climat dans les Comores	En développement

3.3 Objectifs d'adaptation

Les objectifs en matière d'adaptation ont été identifiés ou extrapolés à partir de la SCA2D et les politiques sectorielles existantes et sont répertoriés dans le tableau ci-dessous.

Tableau 4. Principaux objectifs en termes d'adaptation

Secteurs	Objectif 2020	Objectif 2030
<i>Eau</i>	> 66% de la population ayant accès à l'eau potable	> 100% de la population ayant accès à l'eau potable.
<i>Agriculture et élevage</i>		<ul style="list-style-type: none"> > 100% des exploitants agricoles utilisent des techniques et des variétés adaptées à l'évolution du changement climatique ; > 100% des exploitants agricoles ont un système de gestion de l'eau adaptée à l'évolution du changement climatique ;

Secteurs	Objectif 2020	Objectif 2030
		<ul style="list-style-type: none"> > le pays bénéficie d'un système d'alerte précoce et d'intervention efficace capable d'intervenir sur tout le territoire en cas d'émergence de nouvelle maladie bovine ou caprine.
<i>Santé</i>		<ul style="list-style-type: none"> > Le paludisme est éradiqué de l'île ; > le pays bénéficie d'un système d'alerte précoce et d'intervention efficace capable d'intervenir sur tout le territoire en cas d'émergence de nouvelle maladie vectorielle.
<i>Réduction des risques et catastrophes</i>	<ul style="list-style-type: none"> > Le pays bénéficie d'un système d'alerte précoce et d'intervention efficace capable d'intervenir sur tout le territoire 	<ul style="list-style-type: none"> > 100% de la population située en zone vulnérable est déplacée ou bénéficie d'aménagements la protégeant des aléas climatiques et plus particulièrement des risques de submersion ; > le pays bénéficie d'un système de normes de construction qui prend en compte le changement climatique qu'il s'agisse des crues décennales et centennales ainsi que du risque de submersion lié à l'élévation du niveau de la mer et à l'intensification des houles cycloniques.
<i>Intégration et sensibilisation (aspect transversal)</i>	<ul style="list-style-type: none"> > Le processus PAN est mené à son terme; > l'adaptation au changement climatique est intégrée de manière systématique aux programmes de recherche et aux programmes d'éducation à l'environnement; > intégration de l'adaptation au CC dans les lois, stratégies et politiques sectorielles. 	<ul style="list-style-type: none"> > La mobilisation des financements internationaux permet l'atteinte des objectifs fixés précédemment ; > mise en place d'un système alerte précoce permettant de prévenir les événements extrêmes et d'anticiper la réponse à apporter afin de réduire les impacts tous secteurs confondus ; > 100% des populations les plus vulnérables sont sensibilisées aux impacts du CC et informées sur les mesures d'adaptation ; > l'ensemble des acteurs de l'État, centralisés mais aussi décentralisés jusqu'au niveau des communes a bénéficié d'un renforcement de capacité ciblé sur l'adaptation au changement climatique.

Section 4. Équité et ambition

La CPDN sera développée pour être équitable et ambitieuse pour l'Union des Comores, tout en veillant à ce qu'elle contribue à atteindre l'objectif ultime de la Convention de stabiliser le niveau de GES dans l'atmosphère à un niveau non-néfaste au bon fonctionnement des écosystèmes terrestres. Étant donné que les émissions des Comores comptent pour une proportion infime des émissions mondiales de gaz à effet de serre, le pays a donc mis l'accent sur les mesures compatibles avec son statut de petit état insulaire, de PMA et ayant des effets rapides.

Les Comores sont au 159^{ème} rang sur 187 pays selon le classement Indice de Développement Humain (IDH) du PNUD avec un IDH de 0,488 en 2014. Avec un PIB par habitant de 840 US\$ en 2014², les Comores peinent à créer des bases d'une croissance économique durable³. Pour lutter efficacement contre la pauvreté, le pays s'est engagé pour un objectif de développement durable en signant *le manifeste d'Istandra*. Avec une majorité de la population qui vit en région côtière, les actions de lutte contre la pauvreté se sont concentrées sur la protection des zones côtières, gestion de risques etc. dont les principaux effets permettront de réduire la vulnérabilité.

De puits de GES en l'an 2000, l'Union des Comores est passée émettrice en 2015 d'après la projection du scénario de référence et sur la base des inventaires des années 2000, 2005 et 2010. En 2010, les émissions des Comores comptaient pour une proportion infime des émissions mondiales de gaz à effet de serre, soit 0,00045%. Le pays a multiplié les efforts au cours de la dernière décennie en vue d'une croissance durable et de développement vert, résiliente au climat et sobre en émission de carbone sur le plan politique et institutionnel. Ainsi des actions de lutte contre le changement climatique (CC) en termes d'atténuation et d'adaptation sont menées depuis les années 90. De plus, de par les actions mises en place jusqu'à maintenant, les émissions de GES par habitant ont pu être contenues au niveau de 0.4 tonne pendant la période 2000 à 2010. Malgré sa faible contribution aux gaz à effet de serre, l'Union des Comores veut poursuivre l'objectif qu'elle s'est fixée d'être un puits de carbone et participer ainsi à l'effort global de décarbonisation de la planète.

Mais pour cela, la capacité du pays à mettre en œuvre sa contribution a également ses limites. En effet, le niveau de développement économique actuel et à moyen terme ont servi au développement du potentiel d'atténuation, d'adaptation et donc de sa contribution tout en prenant en considération les priorités de développement du pays qu'est la réduction de la pauvreté et autres objectifs du Millénaire.

Cet apport est considéré comme équitable pour les Comores pour permettre à la communauté internationale d'atteindre l'objectif ultime de la Convention sur la stabilisation du niveau de GES dans l'atmosphère, notamment de maintenir le niveau de réchauffement global en dessous du seuil critique de 2°C qui déstabiliserait le fonctionnement des écosystèmes naturels.

L'Union des Comores aspire à transformer son économie à travers des activités contribuant aux émissions minimales de GES, à savoir dans les secteurs de l'énergie et de l'UTCAF, pour arriver à un développement économique neutre en émissions de GES, sinon à un puits. Toutefois, un support financier et technique de la communauté internationale est un prérequis pour le succès de cette contribution à l'atteinte de l'objectif de la Convention.

L'Union des Comores s'engage à réduire ses émissions de gaz à effet de serre par environ 84% en 2030 par rapport aux émissions du scénario de référence sous condition de l'assistance internationale mentionnée. Ce pourcentage représente près de 440 000 tCO₂éq.

² Source : Banque Mondiale

³ http://www.africaneconomicoutlook.org/fileadmin/uploads/aeo/2015/CN_data/Cn_Long_FR/Comores_2015.pdf

Section 5. Arrangements institutionnels

L'Union des Comores utilisera les mécanismes existants de suivi et d'évaluation pour la mise en œuvre de la CPDN. Ainsi les arrangements institutionnels existants seront consolidés pour permettre la mise en œuvre et le suivi de la CPDN. Le Conseil National de Développement Durable (CNDD) créé en 2013 mènera le programme en collaboration avec les Ministères et les autres Directions concernées selon les mesures et actions. Cependant, l'opérationnalité de cette commission nécessiterait des moyens financiers pour être réellement effective.

Le suivi de la CPDN pourra se faire à travers les inventaires de GES des Communications Nationales et des Rapports Biennaux qui seront transmis à la CCNUCC. En ce qui concerne les mesures d'adaptation plus particulièrement, le suivi pourrait se faire à travers les groupes de travail sectoriels et les Comités de Planification et de Suivi-Évaluation du Développement (COPSED).

Section 6. Moyens de mise en œuvre

6.1 Contraintes et besoins

6.1.1 Contraintes

Malgré sa faible contribution aux gaz à effet de serre, l'Union des Comores veut poursuivre l'objectif qu'elle s'est fixée de demeurer un puits de carbone et participer ainsi à l'effort global de décarbonisation de la planète.

L'analyse des différentes composantes de l'économie, montre que l'Union des Comores est en phase de reconstruction et de réforme en tant que pays fragile. De nombreux efforts ont été faits au cours de ces 20 dernières années dans le domaine du développement durable et plus particulièrement celui de l'adaptation mais ces efforts sont éparpillés et leurs résultats peu mesurables.

Cela est dû à de nombreuses lacunes identifiées par diverses études (telles que l'évaluation des capacités (ANCAR), le rapport national de la conférence des Nations Unies sur le Développement durable, le Rapport Maurice, le Plan stratégique de programmation) qu'il faudrait relever aussi bien au niveau institutionnel, politique et stratégique et juridique.

6.1.2 Besoins en adaptation et atténuation

Face à ces contraintes et pour répondre à ces défis, les besoins en moyens humains, techniques et financiers sont les suivants:

- Le manque de ressources financières propres au pays accentue sa dépendance vis à vis de l'aide extérieure. Tous les projets d'adaptation sont financés par l'aide extérieure. Cette dépendance privilégie l'approche projet au détriment de l'approche programme. L'Union des Comores doit assurer la pérennité des actions et passer d'un mode projets à des programmes à plus ou moins long terme et assurer une pérennité des financements également ;
- les institutions en charge de l'adaptation et de l'atténuation manquent de moyens humains, techniques, financiers et matériels. Par ailleurs les textes définissant les mandats, les missions et les responsabilités des institutions (Union et îles) concernées par la gestion et la protection de l'environnement national auraient besoin d'être révisées pour gagner en clarté. En conséquence, ses institutions sont très limitées dans leurs capacités de conception, planification réalisation des actions en matière d'adaptation et d'atténuation. Elles sont également handicapées dans leurs missions de coordination, d'animation, d'encadrement et de sensibilisation ;

- à l'instar de l'adaptation et de l'atténuation, la gestion des risques aux Comores manque de cadre réglementaire et de mécanisme de coordination entre les différents acteurs⁴. Faute de moyens financiers, les ressources limitées de l'Etat ont été utilisées en réponse aux situations d'urgence plutôt qu'à la prévention. Les données de base font cruellement défaut et les résultats d'enquête montrent que la société civile n'était pas suffisamment sensibilisée et préparée pour faire face aux catastrophes naturelles;
- les besoins en transfert de technologies sont inhérents aux mesures et projets d'adaptation à mettre en place et touchent par conséquent la plupart des domaines identifiés.

6.1.3 Mise en œuvre

La CPDN a été travaillé pour produire les résultats escomptés rapidement vu l'urgence de la situation pour atteindre l'objectif de la Convention. Ainsi, un délai d'une à deux années a été pris en considération afin de permettre la création de l'environnement favorable et la mise en place du système nécessaire. Pendant ce temps, il est aussi espéré que les ressources requises seront disponibles pour mener à bien cette tâche si essentielle pour l'avenir de notre planète.

La mise en œuvre de la CPDN représente une gageure pour l'Union des Comores. De multiples défis devront être relevés dans des domaines tels que le renforcement de la capacité humaine, les besoins en technologies et les besoins financiers afin de mener à bien cette CPDN tout en respectant les délais impartis aux différentes étapes.

L'Union des Comores compte sur la communauté internationale pour arriver à consolider les efforts entrepris depuis plus de 20 ans en matière de lutte contre le changement climatique. En effet, un soutien international sous forme de financement, de renforcement de capacités et de transferts de technologies sera primordial afin que l'Union des Comores puisse mettre en œuvre sa CPDN:

- *Soutien financier* – L'Union des Comores aura besoin d'une enveloppe tournant autour de 675 million US\$ pour mener à bien la mise en œuvre de sa CPDN dont 375 millions de dollars pour les mesures d'atténuation et 300 millions pour les mesures d'adaptation. Compte tenu de ses ressources très limitées, l'Union des Comores ne peut entreprendre ses mesures sans l'aide de la communauté internationale. Cependant, la part du budget national pourrait être d'environ 10% de cette enveloppe en se basant sur l'expérience de projets aux Comores. Compte tenu de l'urgence de la situation pour stabiliser la teneur en GES de l'atmosphère, L'union des Comores s'est fixée pour objectif de démarrer la mise en œuvre le plus rapidement possible pour des effets escomptés, et ce, à partir de l'an 2018;
- *Appui au renforcement des capacités* – L'Union des Comores manque cruellement de capacités pour mettre en œuvre, suivre et rapporter les initiatives qui seront mises en place pour la CPDN. L'Union des Comores compte sur la solidarité de la communauté internationale pour lui apporter le support nécessaire. Les besoins en renforcement des capacités sont assez large et comprennent la capacité humaine dans divers domaines, la capacité institutionnelle, le cadre légal, juridique et financier, une meilleure planification en terme de politique, stratégie et plan d'action; et un meilleur suivi des opérations; A titre illustratif, les besoins en renforcement des capacités sont importants en outils d'intégration des effets du changement climatique dans les stratégies, les politiques et les plans d'action d'une part et dans le domaine de suivi et évaluation. Dans le domaine de gestion des risques, le renforcement des capacités des systèmes d'information géographique (SIG) et d'évaluation des risques ainsi que la sensibilisation et préparation de la société civile en matière de gestion des risques sont des priorités.

⁴ Évaluation des risques des catastrophes, 2014.

- *Transfert de technologies* – Le transfert de technologies est une partie intégrante de la CPDN car c'est à travers elles qu'une bonne partie des initiatives en termes d'atténuation et d'adaptation se réaliseront. Les besoins en technologies s'échelonneront sur la majeure partie de la durée de la CPDN. Elles comprennent en matière d'atténuation des technologies sur les énergies renouvelables telles le solaire, l'hydraulique, l'éolienne et la géothermie, l'efficacité énergétique dans l'industrie du bâtiment et autres, les techniques de boisement, agroforesterie, d'arboriculture, d'agriculture de conservation ou agroécologie, de transformation de produit agricole, la préservation et la restauration des forêts et autres aires protégées. Pour ce qui concerne l'adaptation, les transferts de technologie pour les secteurs énergie, foresterie et agriculture cités précédemment sont également pertinents. Ils devront cependant être complétés par des transferts de technologie dans les secteurs de l'eau, de la santé et de la prévention des risques (exemples : système de pompage, captage, stockage, décantation, filtration, réseau de surveillance volcanique, acquisition et traitement d'images satellitaires).

Section 7. Informations complémentaires sur les volets atténuation et adaptation

7.1 Atténuation

7.1.1 Élaboration de la CPDN

Afin de développer une CPDN robuste, réalisable, équitable et ambitieuse, l'approche du bas vers le haut pour arriver à la contribution nationale a été privilégiée. Les mesures d'atténuation ont été développées en ligne avec les politiques et autres stratégies existantes du gouvernement de l'Union des Comores et des spécificités nationales. Une description détaillée des hypothèses et des projections utilisées pour projeter les émissions et absorptions suivent pour chaque option priorisée. Les travaux et rapports nationaux d'autres pays de la région et des îles de l'Océan Indien et des bases de données internationales ont également été utilisés pour compléter les données manquantes ou pour les besoins de validation.

Les principaux documents sur lesquels repose cette élaboration sont:

- Banque centrale des Comores. Rapport Annuel (2013) ;
- Collecte et analyse de données pour l'aménagement durable des forêts - joindre les efforts nationaux et internationaux. (2000). Rapport d'étude sur les données du bois-énergie aux Comores. (2000). B. H. Abdourahaman ;
- Élaboration d'une stratégie sectorielle nationale Énergie aux Comores. (2012). D Levy, A Doulet, A Bourgeois, H Abderamane et Y Aboulhouda ;
- Étude de Faisabilité pour la Transformation des Déchets Organiques en Compost; V Mouafo et S. M Hassani ;
- <http://www.iea.org/stats/index.asp> ;
- Note sur le développement du sous-secteur de l'électricité en Union des Comores. Stratégie et Plan d'Actions Énergie validés le 21 février 2013 en Conseil des Ministres ;
- Stratégie de croissance accélérée et de développement durable. (2015). Plan de mise en œuvre 2015-2019 ;
- Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants. (2013). US Department of Energy ;
- World Statistics Pocketbook. United Nations Statistics Division ;
- 2ème Communication Nationale, Consultation sur le Changement Climatique, Option Atténuation (2011); S.A. Batouli et S Hassani.

7.1.2 Émissions de GES et projections

7.1.2.1 Méthodologies

Les Lignes directrices 2006 du GIEC et le logiciel GIEC 2006 ont été utilisés pour estimer les émissions et absorptions d'après l'équation

$$\text{Emissions} = \text{Données d'activités} * \text{facteurs d'émissions}$$

La même méthodologie a été adoptée pour compiler les émissions des scénarii de référence et d'atténuation, nommément les lignes directrices 2006 du GIEC et le logiciel 2006 du GIEC comme recommandé par la Conférence des Parties pour être consistant et comparable. Les données d'activités proviennent des statistiques du pays pour le passé et les projections obtenues des rapports ou stratégies sectorielles sur le développement. Dans les cas où les projections n'existent pas, la modélisation statistique ou la ligne de tendance ont été utilisés pour estimer les besoins futurs. Ces exercices ont été faits sur la base de la croissance démographique, le taux d'urbanisation, le PIB et le taux de déforestation entre autres.

Les données d'activités comprennent les besoins et productions énergétiques du pays, les volumes de carburants fossiles, le nombre de tête de bétail, le volume de bois prélevé et le volume de déchet ménager produit. La croissance démographique et autre paramètre socio-économique ont été repris des projections faites dans les stratégies de développement du pays.

7.1.2.2 Emissions au niveau national

Les absorptions et émissions en tCO₂éq. par secteur pour les trois années d'inventaire révisées, 2000, 2005 et 2010, sont reprises dans le Tableau 5. Ce dernier montre que l'Énergie, l'Agriculture et l'UTCAF sont les secteurs clés en termes d'émissions. Ces trois secteurs ont donc été privilégiés pour les besoins d'atténuation.

Tableau 5. Résultats des inventaires révisés de l'an 2000, 2005 et 2010 en tCO₂éq.

Secteurs	Année		
	2000	2005	2010
<i>National</i>	-43 100	25 500	141 600
<i>Énergie</i>	106 600	25 600	149 700
<i>Agriculture (Élevage)</i>	53 000	57 000	70600
<i>UTCAF – Émissions</i>	61 500	61 500	61 500
<i>UTCAF – Absorptions</i>	-315 200	-268 800	-209 300
<i>UTCAF – agrégées non-CO₂</i>	24 600	27 300	34 900
<i>Déchets</i>	26 300	29 900	34 200

Les détails sur les hypothèses adoptées pour le scénario d'atténuation par mesure suivent.

Energie :

- Réduire les pertes sur le réseau de distribution électrique

Actuellement les pertes sur le réseau de distribution d'après le rapport « Elaboration d'une stratégie sectorielle nationale énergie aux Comores » atteignent 30%. La réhabilitation du réseau est une des mesures phare d'atténuation car elle peut être mise en place assez rapidement avec des résultats concrets à partir de l'année 2020. Ainsi, l'hypothèse est une réhabilitation du réseau pour faire baisser cette perte à 15%.

- Réhabiliter des centrales électriques

Les générateurs d'électricité à hydrocarbures sont assez mal entretenus faute de moyens et de capacités humaines. C'est une des autres mesures qui gagnerait à être mise en place avec diligence avec des résultats immédiats. Actuellement la perte lors de la transformation dans les centrales est estimée à 8% et une diminution à 6 % est envisageable.

- Adoption du solaire

La pénétration du photovoltaïque a été travaillée pour intégrer le système à partir de l'année 2020 afin d'atteindre les objectifs nationales d'électricité produite à partir de sources renouvelables. Ainsi, l'exploitation d'un potentiel de 14 MW graduellement en trois étapes a été travaillée.

- Augmenter le potentiel hydro

De même, pour le développement de l'électricité à partir des centrales hydro jusqu'à 2030 avec pour but d'arriver au potentiel maximal du pays.

- La Géothermie

La géothermie est actuellement en exploration depuis déjà quelques années et le gouvernement y est confiant comme une source potentielle d'énergie renouvelable pour la production d'électricité dans le futur. Etant donné le temps nécessaire pour conclure les études et se lancer dans la production d'électricité, elle a été considérée que vers la fin de la période sous analyse, nommément vers 2030. Ainsi, la comptabilisation des GES qui pourraient être évité a été prise en considération pour l'année 2030. Une production de quelques 14 MW à l'horizon 2030.

- Promouvoir l'utilisation du GPL à la place du pétrole et du bois

La vulgarisation de l'utilisation du GPL par les ménages et possiblement en remplacement de l'essence dans les voitures favoriserait aussi une diminution des émissions. Une pénétration annuelle de 3% de la consommation a été prise comme hypothèse sans toutefois départager les utilisations finales.

- Promouvoir les foyers améliorés

Cette option n'a pas été évaluée pour sa capacité d'atténuation car son adoption n'a pas eu beaucoup de succès en dépit des efforts investis. De plus, les résultats restent difficiles à quantifier. Pour les besoins de l'étude, il a été considéré que l'introduction des foyers améliorés au niveau domestique et dans la production de l'huile essentiel Ylang Ylang mènerait à une diminution graduelle de 5% à l'échelle 2020, 2025 et 2030 du volume de bois utilisé. Donc, les estimations de réductions d'émissions ont été faites ensemble sous l'option réduction du volume de bois de chauffe. Cette réduction dans le volume de bois utilisé est comprise avec d'autres actions considérées sous la section UTCAF ci-après où les estimations d'émissions sont normalement faites.

Tableau 6. Réductions de GES des mesures d'atténuation pour le secteur Energie: horizon 2020, 2025 et 2030

Mesures atténuation	Potentiel de réductions de GES (tCO ₂ éq.)		
	Horizon 2020	Horizon 2025	Horizon 2030
Energie			
<i>Réduire les pertes sur le réseau de distribution électrique</i>	11 900	15 000	19 000
<i>Réhabiliter des centrales électriques</i>	1 600	2 000	2 500
<i>Adoption du solaire</i>	2 700	7 800	9 400
<i>Augmenter le potentiel hydro</i>	2 300	4 700	10 300
<i>Géothermie</i>	0	0	11 900
<i>Promouvoir l'utilisation du GPL à la place du pétrole et du bois</i>	6	11	12
<i>Promouvoir les foyers améliorés</i>	Comptabilise sous réduction bois de chauffe		

Agriculture :

- Promouvoir l'agriculture de conservation

L'agriculture de conservation, tout comme les foyers améliorés, fait une percée timide auprès des agriculteurs. Cette option aussi demeure difficile à évaluer et à projeter dans le futur. Elle n'a donc pas été quantifiée pour son impact sur les émissions de GES.

UTCAF

- Réduction de la consommation du bois de feu, de service et industriel

La consommation du bois provenant des forêts et autres réserves de biomasse constitue la plus grande part des émissions de GES actuellement. En plus, elle est source de dégradation du terroir avec des effets négatifs sur d'autres secteurs tels la production de cultures vivrières et l'élevage. Elle représente donc une activité d'importance majeure à cibler pour réduire les émissions. Il est nécessaire de considérer ce problème de manière intégrée car il est transversal et lié à d'autres activités résidentielles et industrielles. En effet, les mesures privilégiées dans les autres secteurs vont dans ce sens tel le taux d'électrification, la promotion du GPL, la vulgarisation des foyers améliorés pour les ménages et les besoins industriels et la substitution de bois de service par d'autres matériaux.

L'hypothèse est de réduire cette utilisation par 15% chaque cinq ans, ce qui mettrait un frein à la déforestation et qui mènerait à une réduction de la déforestation par 45% en 2030.

- Afforestation des prairies ou autres terres en friche

Avec le temps et faute de moyens, la superficie sous prairie a augmenté dans l'île suite à la déforestation et aujourd'hui cet état de choses a des effets néfastes sur d'autres secteurs. Le reboisement et l'afforestation sont des pratiques courantes depuis plus d'une décennie mais n'ont pas eu beaucoup de succès compte tenu des circonstances nationales. On note ainsi le faible taux de réussite des plantules mises en terre à cause de la mauvaise maîtrise des variations climatiques et la divagation du bétail. L'objectif de la politique nationale, la SCA2D, est de couvrir une surface de 11116 ha à l'horizon 2019, équivalent à 6% de la superficie du territoire. L'afforestation sur une partie de cette surface avec des espèces de bois commercial se présente comme une solution idéale car cela permettrait de séquestrer du gaz carbonique tout en pourvoyant le bois requis pour les besoins résidentiels, de service et industriels. En conséquence, le plan serait de commencer avec l'afforestation suivi du reboisement avec des espèces indigènes quelques années après. Cette approche de la mise en œuvre du programme de reforestation prend en considération la préparation des plantules et autres mesures associées.

- Reboisement

Une meilleure planification de reboisement est nécessaire et demandera plus d'investissement pour garantir son succès. L'Union des Comores a pour objectif la reforestation de 2200 ha annuellement sur une période de 5 ans allant de 2015 à 2019 pour être en ligne avec la SCA2D. Mais la mise en œuvre semble difficile faute d'avoir pu réunir le financement nécessaire à ce jour. Cette superficie a donc été répartie en reboisement et afforestation sur 12 ans à partir de l'année 2018 sous réserve de trouver le financement. Cette approche permettra une diminution de la pression sur la ressource forestière dans le temps avec pour but une exploitation durable dans le moyen et long terme. Simultanément, des bénéfices connexes seront obtenus par rapport à la dégradation du sol et des ressources en eau. Indirectement, ce dernier aspect aura intrinsèquement des effets positifs sur la pérennité de la production d'autres secteurs liés à l'eau.

Agroforesterie :

Pour l'agroforesterie, les terres agricoles abandonnées seront ciblées pour cette activité. L'intention est de convertir 200 ha annuellement pour agroforesterie. Ceci tout en étant un puits de GES va aussi créer de l'emploi et produire de la richesse aux communautés.

Arboriculture :

Pour l'arboriculture, c'est encore une fois les terres agricoles abandonnées qui seront converti au taux de 200 ha annuellement. Tout en étant un puits de GES, cette activité créera de l'emploi, aidera à la sécurité alimentaire et produira de la richesse pour les communautés.

Aires Protégées :

Le gouvernement Comorien a planifié de renforcer ses actions pour la conservation de la biodiversité marine et terrestre. Ainsi, il est projeté de passer à un total de 50 000 ha environ de terre sous couvert végétale, principalement les forêts, d'aires protégées à l'horizon 2030.

Le sommaire des réductions d'émissions à travers des mesures d'atténuation du secteur UTCAF est présenté dans le Tableau ci-dessous.

Tableau 7. Réductions de GES des mesures d'atténuation pour le secteur UTCAF: horizon 2020, 2025 et 2030

Mesures atténuation	Potentiel de réductions de GES (tCO ₂ eéq.)		
	Horizon 2020	Horizon 2025	Horizon 2030
Réduction de la consommation du bois de feu, de service et industriel	33 000	68 000	104 000
Afforestation des prairies ou autres terres en friche	39 000	78 000	78 000
Reboisement	0	18 200	70 200
Agroforesterie	13 000	34 000	56 000
Arboriculture	13 000	23 000	29 000
Aires Protégées (50000 ha)	45 800	45 800	45 800

Déchets

Il existe bien une politique de gestion des déchets solides et liquides mais sa mise en œuvre n'est pas encore effective. Les projets identifiés pour les déchets ménagers incluent le compostage après tri et l'enfouissement dans les grandes agglomérations et la production du biogaz ailleurs. Le compostage ainsi que la production du biogaz aidera à réduire les émissions (Tableau 8).

Tableau 8. Réductions de GES des mesures d'atténuation pour le secteur Déchets: horizon 2020, 2025 et 2030

Mesures atténuation	Potentiel de réductions de GES (tCO ₂ eéq.)		
	Horizon 2020	Horizon 2025	Horizon 2030
Compostage et Biogaz	4400	5000	5500

Les projections des émissions et absorptions sectorielles en tCO₂eéq. à pas de cinq ans pour la période 2015 à 2030 sont présentées dans le Tableau 2.

Tableau 9. Projections de GES (2015-2030) selon le CNA en tCO₂eéq.

Secteurs	Année			
	2015	2020	2025	2030
National	229 500	357 800	434 500	523 000
Énergie	181 300	219 100	266 500	319 200
Agriculture (Élevage)	81 400	85 600	89 800	94 100
UTCAF – Émissions	61 500	50 000	59 600	69 100
UTCAF – Absorptions	-175 100	-85 200	-78 300	-68 900
UTCAF – agrégées non-CO ₂	41 200	43 600	46 100	48 500
Déchets	39 100	44 700	50 800	56 000

7.2 Adaptation

7.2.1 Contexte: tendance et vulnérabilité au changement climatique

L'Union des Comores est un archipel, situé au Nord du Canal du Mozambique. Cet État, à l'instar des autres pays insulaires en développement, se caractérise par sa vulnérabilité très importante aux impacts du changement climatique.

À l'échelle du Sud-Ouest de l'Océan Indien, l'étude des données disponibles sur les 50 dernières années révèle déjà un réchauffement significatif sur l'ensemble du bassin avec une augmentation moyenne régionale significative de +0,2°C par décennie ainsi qu'une baisse de la quantité annuelle de précipitations pour la période. Ces tendances sont confirmées à l'échelle des Comores.

À l'horizon 2050, les changements climatiques se manifesteront par une légère hausse de la pluviométrie par rapport à la normale pour les mois de janvier à avril et de décembre. Contrairement aux autres mois où on constatera une baisse de la pluviométrie.

À l'échelle nationale, ces modifications se manifesteront par une augmentation de la température de 1,26 à 1,47°C.

Le réchauffement sera encore plus prononcé en l'an 2100 avec une variation de 1,99 à 2,35 °C. D'une façon générale, la variation thermique aurait presque doublé de 2050 à 2100 si aucune mesure d'atténuation n'est prise. Pour la pluviométrie, il y aura une baisse significative pour les mois d'août à novembre.

Le niveau de la mer devrait augmenter de 4mm par an au cours des cinquante prochaines années. Cette augmentation correspond à une élévation moyenne potentielle de 20 cm, une élévation deux fois plus importante que l'élévation observée au cours des cent dernières années (20 à 25 cm).

La proportion de vulnérabilité est estimée à 82,1%, avec des dommages causés par les changements climatiques qui dépassent dès 2020 la valeur du PIB. La vulnérabilité des Comores repose sur la sensibilité à l'aléa climatique et la capacité d'adaptation. Elle dépend de fait de facteurs physiques, humains et socioéconomiques; la pauvreté du pays étant la cause principale. Les principaux aléas impactant les Comores sont:

- L'augmentation de la température ;
- l'élévation du niveau de la mer (érosion et submersion) ;
- la modification du régime des précipitations ;
- la modification du régime des vents ;
- l'acidification des océans ;
- la modification des cycles fondamentaux.



République du Congo

GOVERNEMENT DE LA REPUBLIQUE

CONTRIBUTION PREVUE DETERMINEE AU NIVEAU NATIONAL
dans le cadre de la CCNUCC
Conférence des Parties 21

21 septembre 2015

PRÉAMBULE

La 21^{ème} Conférence des Parties (COP21) à la Convention Cadre des Nations Unies sur les Changements Climatiques (CCNUCC) se tiendra à Paris, en décembre 2015. Un des principaux objectifs de cette conférence est de parvenir à l'adoption d'un accord juridiquement contraignant applicable à tous les Etats Parties, afin de limiter la hausse de la température planétaire en deçà de 2°C. Chaque Etat Partie est ainsi appelé à contribuer au développement du nouvel accord, en définissant les contributions qu'il pourra mettre en œuvre pour lutter contre les changements climatiques, et s'y adapter, sous la forme d'une Contribution Prévue Déterminée au niveau National (CPDN). C'est ainsi que le Congo s'est attelé à élaborer sa contribution nationale, afin de la transmettre avant le 1^{er} octobre au secrétariat de la CCNUCC, en perspective de la COP21.

Il convient néanmoins de rappeler que le niveau d'émissions de gaz à effet de serre (GES) du pays reste à un niveau très raisonnable, inférieur à la moyenne mondiale. Cependant, la croissance forte du pays s'accompagne logiquement d'une augmentation importante de ces émissions. En parallèle, le phénomène global des changements climatiques impacte très sensiblement les conditions de la production agricole ainsi que l'équilibre des écosystèmes.

Grace à une politique de gestion durable de ses ressources forestières, le Congo a conservé une couverture forestière importante (65% du territoire national), constituant un puits de carbone et un réservoir de biodiversité inestimable pour l'ensemble de la planète. Cependant le pays ne se sent pas suffisamment soutenu par la communauté internationale dans ses efforts de préservation des forêts.

Pour un pays comme le Congo, il est totalement exclu de considérer les émissions sans prendre en compte l'ensemble du développement socio-économique du pays. Il s'agira effectivement de réduire les émissions de GES du pays sans compromettre ses capacités de développement. Ainsi, des politiques alternatives à faible émissions de carbone et peu gourmandes en ressources naturelles, entrant dans le cadre plus large de l'« économie verte », sont promues dans cette CPDN.

La République du Congo se trouve actuellement dans une situation compliquée de type économie de rente avec des risques de fortes variations des ressources budgétaires basées sur la mono-ressource pétrolière. Pour s'industrialiser sans mettre en danger son environnement naturel, le Congo a besoin de diversifier son économie et d'accéder à des technologies alternatives et innovantes.

Par ailleurs, le secteur agricole demeure peu développé, nonobstant les différents appuis et initiatives gouvernementales dans le domaine, éloignant par conséquent les perspectives affichées d'une autosuffisance alimentaire. Le pays reste fortement tributaire des importations pour satisfaire ses besoins alimentaires sans cesse croissants. Cela constitue une source importante de dépense en devises. Ce secteur se développera grâce à un partenariat étroit entre des investisseurs transformateurs et des coopératives de producteurs, aidé par des Organisations Non-Gouvernementales (ONG). Cette intensification agricole, source de richesse et de devises pour le pays est de nature à fournir des emplois non seulement aux agriculteurs en milieu rural mais aussi à des jeunes du milieu urbain. Ces mesures permettront ainsi de lutter contre la pauvreté et la précarité alimentaire.

Ces mesures de développement doivent s'accompagner d'une organisation et d'une protection minimale du marché intérieur, notamment pour les produits de première nécessité, en privilégiant par exemple la production nationale par rapport aux biens importés.

Les ressources et potentialités considérables dont dispose le pays en matière agricole, forestière, hydroélectrique, touristique, sont autant d'atouts pour le développement d'une économie peu

carbonée et génératrice d'emplois. Les moyens mis en œuvre détermineront le niveau de verdissement du développement, qui s'inscrira quoiqu'il en soit dans un objectif de développement économique national.

L'évaluation de ces moyens doit prendre en compte en premier lieu les actions indispensables au démarrage d'un développement global et soutenu du pays incluant une bonne gouvernance, une simplification des formalités administratives, un soutien aux études préalables, la promotion et le rayonnement du pays à l'international, la création d'infrastructures, ainsi que le soutien délibéré des pouvoirs publics et de l'opinion publique.

C'est pourquoi le travail qui suit simule les perspectives économiques, sociales et climatiques d'un développement diversifié répondant à un objectif de croissance de 10 % par an sur les modèles du Ghana, de la Côte d'Ivoire, du Kenya ou encore du Brésil.

Deux scénarios sont simulés en ce qui concerne les émissions de gaz à effet de serre : un scénario tendanciel non conditionné incluant les engagements que la République du Congo a déjà pris en matière de réduction de gaz à effet de serre, pour lequel une aide particulière n'est pas demandée et un scénario bas carbone conditionné par l'aide internationale.

Il convient de noter que sans aide supplémentaire ni soutien en matière de transfert de technologie, la République du Congo ne peut s'engager que sur les émissions du scénario tendanciel.

Contexte national de la démarche

Le gouvernement de la République du Congo a ratifié la Convention Cadre des Nations Unies sur les Changements Climatiques (CCNUCC), le protocole de Kyoto et d'autres accords multilatéraux sur l'environnement. Il a dans ce contexte produit un Plan National d'Action pour l'Environnement (PNAE) qui a joué un rôle central dans l'identification de la vulnérabilité du pays face aux effets du changement climatique.

En outre, une Stratégie Nationale et un Plan d'Action pour les Changements Climatiques et la Variabilité (SNPA / CCV, 2004) ont été développés. Bien que le pays n'émette qu'environ 1,1 tCO₂ par habitant et par an, il subit déjà les effets du changement climatique. La vulnérabilité est aggravée par de multiples contraintes biophysiques nuisant au développement, ainsi que par la faiblesse de ses capacités d'adaptation.

Cette contribution tient compte des stratégies et plans existants de la République du Congo, notamment le Plan National de Développement, le Document de Stratégie pour la Croissance, l'Emploi et la Réduction de la Pauvreté, la Stratégie Nationale et Plan d'Action de mise en œuvre de la Convention Cadre des Nations Unies sur les Changements Climatiques et la Stratégie Nationale de Développement Durable.

La présente soumission est la concrétisation de l'engagement du Président de la République de conduire son pays à l'émergence d'ici à 2025 à travers une politique de développement durable et d'appui à l'effort mondial de réduction des émissions des GES.

Atténuation du changement climatique

Informations sur la contribution

La République du Congo est un pays en développement avec une croissance démographique de 3 % par an. Sa croissance économique (hors secteur pétrolier) est estimée à 6% par an à partir de 2010 dans certaines prévisions. Comme indiqué dans la Stratégie « Congo Vision 2025 », une croissance de 10% par an sera retenue pour le présent document.

Bien que le Congo concentre ses efforts dans le secteur de l'énergie, ses objectifs de réduction de gaz à effet de serre (GES) seront réalisés grâce à des mesures prises dans tous les secteurs de l'économie, s'appuyant sur des stratégies et des plans d'action sectoriels touchant notamment les domaines de l'agriculture, de l'eau, des déchets, des forêts, de l'énergie, de l'industrie et de l'habitat. Les informations sont synthétisées dans le tableau ci-dessous.

Type d'engagement conditionné par les moyens internationaux	Réduction par rapport à un scénario de développement tendanciel
Périmètre	Ensemble des émissions de GES hors stockage de carbone dans la biomasse forestière
GES	CO ₂ , CH ₄ , N ₂ O (HFC, PFC, SF ₆ et NF ₃ seront couverts ultérieurement)
Année de référence	2000
Période	2015-2025-2035
Niveau de réduction conditionnée	Au moins 48 % de réduction des émissions par rapport au scénario de développement non maîtrisé (tendanciel) en 2025 et de 55 % en 2035
Secteurs couverts	Énergie, dont les hydrocarbures Procédés industriels et traitement des déchets Mines et cimenteries Agriculture et élevage Utilisation des terres, leur changement et la forêt (hors puits naturel-restockage des forêts)
Développement tendanciel non conditionnel	Projection des émissions de GES à l'horizon 2025 et 2035, partant de 2000, année de référence
Développement bas-carbone conditionnel	Projection des émissions de GES à l'horizon 2025 et 2035, partant de 2000, année de référence sur la base de deux scénarii : Le scénario tendanciel et le scénario bas-carbone conditionnel
Potentiel de réchauffement Global (PRG)	Les valeurs de PRG utilisées sont celles utilisées par les experts du GIEC, selon la décision CP.8 de la CCNUCC pour la préparation des inventaires nationaux des d'émissions : PRG CO ₂ =1 (par convention), PRG CH ₄ = 21 et PRG N ₂ O = 310
Méthodologies pour l'estimation des émissions	Les approches méthodologiques sont basées sur l'usage des méthodes suivantes : - Les lignes directrices de l'IPCC 2006 - Les méthodes supplémentaires révisées et le guide de bonne pratique développés à partir du Protocole de Kyoto de l'IPCC 2013

Le présent document intègre les travaux de la seconde communication nationale à la Convention Cadre des Nations unies sur les Changements Climatiques, elle-même basée sur les inventaires des gaz à effet de serre de l'année 2000 ainsi que le suivi du système d'information énergétique du pays.

Axes de la politique d'atténuation des émissions de gaz à effet de serre

Sur la base de l'inventaire national des émissions de gaz à effet de serre (GES) de l'année 2000, les émissions de GES, hors forêts, s'élèvent à 2 000 kteqCO₂. Ces émissions sont largement compensées par la capacité de séquestration des forêts congolaises, évaluée à 72 700 kteqCO₂¹ (puits naturel forestier, dont il ne sera plus tenu compte dans le reste du document). La politique d'atténuation des émissions de GES en République du Congo s'est fixée les deux axes suivants:

- atténuer les émissions de GES dues aux secteurs de l'énergie et la lutte contre la déforestation non planifiée (REDD), et ce en maîtrisant la consommation énergétique tout en ayant davantage recours aux énergies renouvelables ;
- maintenir, voire renforcer le potentiel de séquestration du carbone par les forêts, et ce par une meilleure gestion du secteur, ainsi que par le reboisement.

Fondement de la contribution de la République du Congo

Les engagements de réduction des émissions de GES pris par la République du Congo ciblent en priorité les émissions de GES hors stockage de carbone par la biomasse. La République du Congo comme les autres pays du bassin du Congo ne souhaite pas limiter sa politique Climat à la simple conservation de forêts à l'aide de mécanismes de financement internationaux. Cette option mettrait le pays sous la dépendance des mécanismes extérieurs et grèverait son développement économique et social, parce que manquant de lien avec l'économie réelle.

Deux scénarios d'émissions de GES ont donc été élaborés :

- **Un scénario tendanciel**, qui correspond à un développement économique faiblement maîtrisé du point de vue des émissions. Il intègre néanmoins les décisions déjà prises par le pays (politiques publiques engagées après 2000 telles que le code forestier, le réseau des aires protégées, la directive nationale de réduction du torchage,...). L'engagement actuel du pays ne peut concerner que ce scénario, si les engagements financiers supplémentaires sollicités ici auprès de la communauté internationale ne sont pas obtenus.
- **Un scénario « bas carbone conditionnel »**, conditionné précisément par de nouveaux engagements de la communauté internationale chiffrés ci-après.

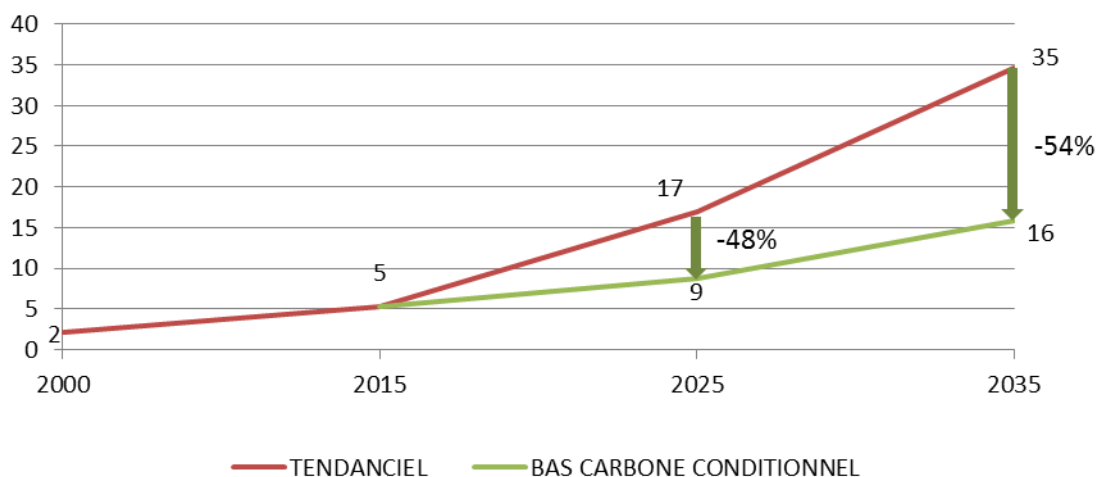
Ce document présente une synthèse de l'évaluation de ces scénarios, en termes d'émissions de gaz à effet de serre, mais également de coûts et de cobénéfices associés (développement économique, emplois, sécurité énergétique, adaptation aux changements climatiques, etc.).

¹ Seconde communication nationale 2009

Synthèse des scénarios

La contribution de la République du Congo devrait permettre de réduire, dans un scénario bas-carbone conditionnel (dépendant de l'appui de la communauté internationale), les émissions de GES d'environ 48% en 2025 (soit 8MteqCO₂), et 54% en 2035 (soit 19MteqCO₂) par rapport au scénario tendanciel.

Evolution des émissions totales de GES - hors forêt (MteqCO₂)



En 2025, les émissions pourraient être multipliées par 3 dans un scénario tendanciel, et n'augmenter que de 64% dans le cadre d'une économie bas-carbone.

En 2035, un scénario tendanciel amènerait à multiplier les émissions par 6, tandis qu'elles ne seraient multipliées que par 2,7 dans un scénario bas carbone.

ANNEES	EMISSIONS (sans changement d'affectation des sols)					
	2000	2015	2025 TENDANCIEL	2025 BAS CARBONE CONDITIONNEL	2035 TENDANCIEL	2035 BAS CARBONE CONDITIONNEL
TOTAL en kteqCO ₂	2044	5317	16984	8793	34527	15858
TOTAL en teqCO ₂ /pers.	0,72	1,10	2,55	1,32	3,75	1,72

Les émissions (hors changement d'affectation des sols), qui ne sont actuellement que de 1,1 tonne de CO₂ par habitant, passerait à 2,55 t par habitant en 2025, et à 3,75 t de CO₂ par habitant en 2035 dans le scénario tendanciel, ce qui est inférieur à la moyenne des émissions mondiales actuelles par habitant. Dans un scénario bas carbone ces émissions passeraient à 1,32 tonne par habitant en 2025, et à 1,72 en 2035, inférieur à 2 tonnes de CO₂ par habitant, ce qui est l'objectif de convergence des émissions pour la planète.

Mesures ou options d'atténuation par secteur

Activités de gestion forestière et reboisement, Conservation des forêts

La déforestation, dont l'une des premières causes est l'extension de l'agriculture, représente 81 % des émissions du pays. L'accroissement démographique va induire des besoins alimentaires croissants, occasionnant le développement de cultures vivrières et industrielles, dont une partie pourrait provoquer une amplification de la déforestation, qui reste faible jusqu'à présent (déforestation nette de 0,043% par an [BRLi, 2014]).

➤ Scénario tendanciel

Par rapport à cette évolution, le scénario de développement tendanciel repose sur :

- l'adoption d'une nouvelle loi forestière qui impose l'utilisation de techniques d'exploitation à impact réduit ainsi que la certification forestière. D'ici 2016, la quasi totalité des 11,7 millions d'hectares de la superficie forestière affectée à la production disposeront d'un plan d'aménagement forestier.
- des opérations de reboisement dans le cadre du PRONAR, qui ne sont que de 500 ha actuellement devraient pouvoir passer à 100 000 ha par an, comportant des plantations forestières et agro-forestières ainsi que des surfaces de restauration de forêts.
- l'adoption d'un Plan National d'Affectation des Terres (PNAT) permettant de garantir un domaine forestier permanent.

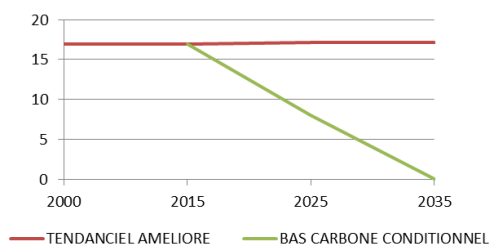
Il faut toutefois signaler, que grâce à un faible taux de déforestation, et à un fort potentiel de séquestration naturelle des forêts tropicales du pays, celle-ci est largement supérieure aux émissions, et pourra encore augmenter grâce aux plantations.

➤ Scénario bas-carbone

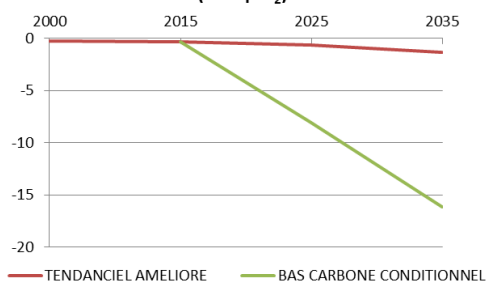
Dans une perspective bas-carbone conditionnelle, il est proposé de :

- demander que l'ensemble des unités d'aménagement et d'exploitation deviennent certifiées en 2025, et qu'au moins tous les exploitants disposant de plus de 100 000 ha de superficie "utile" dans leur concession installent des unités de cogénération recyclant les produits issus de la transformation du bois ;
- réduire en 2035 la déforestation non planifiée à 20 % de son niveau actuel, par la mise en œuvre de la REDD+, y compris dans les aires protégées ;
- généraliser l'utilisation des foyers améliorés (20 % en 2025 et 50 % en 2035) ;
- améliorer toutes les meules de charbon en 2025 (le rendement passe de 15 à 25 %) ;
- transférer une partie des plantations prévues de palmiers à huile en savane (100 000 ha) ;
- développer la transformation des bois ;
- former les cadres dans différentes écoles forestières et écoles des métiers du bois ;
- créer un observatoire des forêts.

Evolution des émissions de GES liées à la déforestation (MteqCO₂)



Evolution du puits de carbone lié à la reforestation (MteqCO₂)



Secteur de l'agriculture

L'agriculture est très peu développée au Congo puisque seulement 2 % des terres sont utilisées par le secteur vivrier, avec des techniques très rudimentaires. L'agro-industrie se cantonne essentiellement à la production de sucre et de maïs sur 312 000 ha. Il en résulte que 80 % des produits alimentaires destinés aux milieux urbains sont importés.

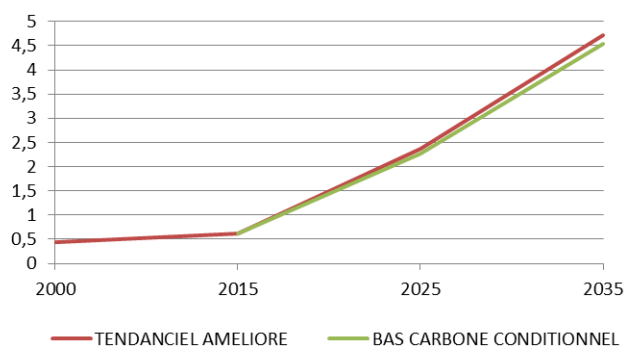
Il est proposé de mettre en valeur 50% des savanes dans le cadre de partenariats privés-coopératives agricoles pour la production de denrées vivrières (manioc, arachide, patate douce, pomme de terre, banane, plantain, igname, riz, viandes, huile de palme, maïs,...) mais également des denrées d'exportation ou d'aliments pour le bétail (soja, pellets). La production de canne à sucre ou d'huile de palme pourrait également être étendue pour la production d'éthanol ou de diester destinée aux carburants agricoles et ruraux. Dans le cas du Congo, il n'y a pas de concurrence entre la production énergétique et alimentaire, du fait des espaces disponibles.

Les techniques agricoles employées seraient résolument celles de l'agro foresterie et de l'agro écologie, valorisant les légumineuses, produisant du bois-énergie (pellets notamment) et de service, tout en palliant les effets néfastes des changements climatiques, constituant ainsi un important co-bénéfice entre l'atténuation et l'adaptation. Des projets de cacaoculture permettant de réduire les émissions dues à la déforestation sont des exemples à répliquer. Le cheptel animal serait quadruplé, dans le cadre de technique sylvo-pastorales, ce qui sera un facteur d'émissions supplémentaire. Les nouvelles sociétés agroalimentaires s'associeraient avec des coopératives d'agriculteurs maîtrisant le foncier (exemple de la Zambie, [Keith Palmer, Patient Capital]). Ces associations induiraient le transfert des technologies et des intrants vers les agriculteurs, sans compter les actions sociales, dans un esprit de respect des sols et des richesses biologiques du milieu environnant (création de micro-réserves biologiques). Ces actions seraient menées en partenariat avec des O.N.G. de développement (type IPHD). Les emplois créés sont estimés à 700 000 (5 ha par agriculteur sur 66% des surfaces mises en valeur), soit la demande prévisible d'emploi rural en 2035. L'autosuffisance étant atteinte, les produits d'exportation pourraient atteindre 13 millions de tonnes, contribuant ainsi à réduire la pauvreté du secteur rural.

La pêche maritime et fluviale ainsi que l'aquaculture couvrent seulement 60 % de la consommation. Afin d'atteindre l'autosuffisance en 2035, il conviendrait de sextupler les prises et la production en 2035, avec une incidence proportionnelle sur la consommation de gasoil.

Par ailleurs, en s'inspirant de la Politique Agricole Commune de l'Union Européenne, une protection minimale du marché intérieur des produits de première nécessité serait organisée par l'instauration de taxes et de quotas à l'importation de ces produits.

Evolution des émissions de GES dans l'agriculture (MteqCO₂)



Mines et cimenteries

Le potentiel d'exploitation minière du Congo est très important, en particulier dans le secteur du fer, de la potasse, de l'uranium, de l'or et des diamants, et encore inexploité. La plupart des projets se trouveraient en zone forestière.

Dans un scénario tendanciel, on estime que 70 % de l'énergie consommée en 2025 sera issue d'énergies renouvelables (hydroélectricité, dont la moitié produite localement, sans appel au réseau public) et 80 % en 2035 (hypothèse d'augmentation sur la base d'investissements privés), tout en adoptant les modes d'extraction les plus respectueux de l'environnement.

Les cimenteries utilisent l'hydro-électricité comme énergie de base, et le fuel pour les fours à clinker.

Il est proposé en scénario bas-carbone d'augmenter la part des énergies renouvelables à utiliser pour l'extraction des produits miniers à hauteur de 90 % en 2025 puis à 95 % en 2035 (utilisation de la biomasse issue de plantations en savane en complément de l'hydro-électricité).

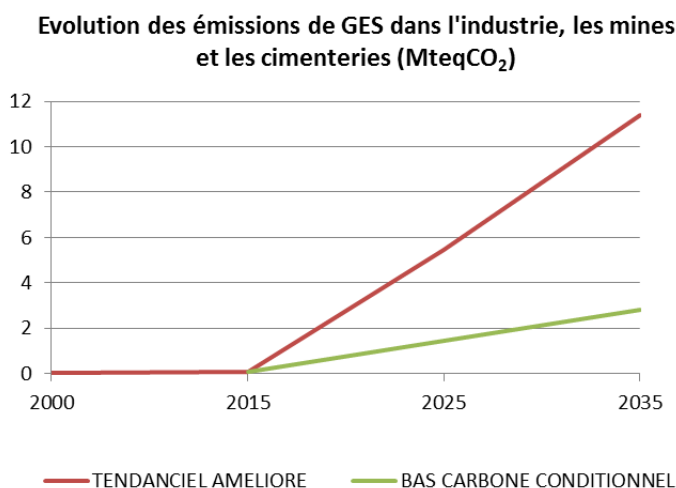
Autres industries

La République du Congo mise sur une croissance de 10% par an dans les prochaines années², ce qui correspondrait à un investissement annuel d'environ 5 300 milliards de FCFA sur 2015-2025.

Le secteur privé participera aux investissements dans le pays dans les conditions suivantes :

- mise en place d'un ensemble d'infrastructures routières, électriques et portuaires permettant une production « verte » et une bonne circulation des produits notamment à l'export ;
- implication de l'État ainsi que des investisseurs congolais dans le secteur industriel, le secteur tertiaire ou encore dans le bâtiment ;
- coopération d'investisseurs privés et de banques congolaises avec des investisseurs et des financeurs internationaux pour le financement d'investissements industriels.

Les investisseurs auraient l'obligation d'appliquer une éthique environnementale et sociale permettant d'une part de créer des investissements compatibles avec une économie verte et bas carbone, et d'autre part d'investir dans des actions sociales de proximité du type dispensaire, cantine, école... Les emplois générés seraient de plus de 400 000 pour le seul secteur industriel.



² Le Congo a un PIB de 14,4 milliards de \$US en 2014 et un PIB par habitant de 3135 \$US en 2013. Du fait d'une augmentation de la population de 3 % par an le taux de croissance qu'il s'est choisi de 10% par an. Sur le modèle des brasseries du Congo, il est proposé qu'un développement industriel intervienne à partir des investissements massifs à mettre en place, en moyenne de 5 300 milliards de CFA par an à partir de 2025 .

Consommation des ménages et transport

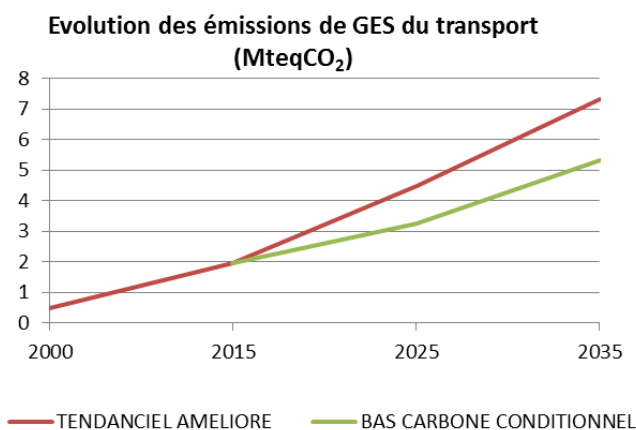
La consommation en énergie est dominée à plus de 80% par la demande en bois-énergie des ménages. Compte-tenu d'une augmentation de 3 % de la population et de l'attractivité des villes, la population devrait atteindre 8,5 millions d'habitants en 2035, et serait urbaine à 83 %, tandis que la population rurale devrait stagner.

Par ailleurs, les besoins alimentaires ont été estimés pour ces mêmes populations en vue d'atteindre l'autosuffisance alimentaire en 2025. Les niveaux de demande énergétique sont basés sur cette augmentation ainsi que l'atteinte en 2035 d'une consommation individuelle de 2500 kWh par an³, contre seulement 150 kWh par personne actuellement.

En matière de consommation domestique, l'objectif est de permettre l'accès à électricité pour 75% des urbains en 2025 et 100 % en 2035 avec respectivement des taux de 50 % et de 75 % en milieu rural. Par ailleurs, l'extension des foyers améliorés à charbon de bois, de même que la réalisation de meules améliorées par les charbonniers devrait permettre de diminuer sensiblement la consommation d'énergie.

En termes de transport, de nombreux projets sont prévus, qu'il s'agisse de projets d'infrastructures, le développement de services de transport en commun (notamment à Brazzaville et Pointe-Noire), pour lutter contre la congestion ou des évolutions de la législation (par exemple l'interdiction de l'importation de véhicules de plus de 5 ans). Dans un scénario bas-carbone conditionnel, il est proposé de maîtriser la hausse des consommations d'énergie liées au transport à 70% du scénario tendanciel en 2025⁴, avec une option « carburant renouvelable » (pour 21 à 43% des consommations).

Le nombre de demandeurs d'emplois devrait passer de 800 000 actuellement à 3,7 millions en 2035 soit un quadruplement. Les emplois directs créés par les perspectives de chaque secteur étudié devraient totaliser 1,5 millions, ce qui, avec les emplois induits, devrait permettre d'atteindre le plein-emploi en 2035.



³ ratio de consommation actuelle du Brésil

⁴ PND

Energie

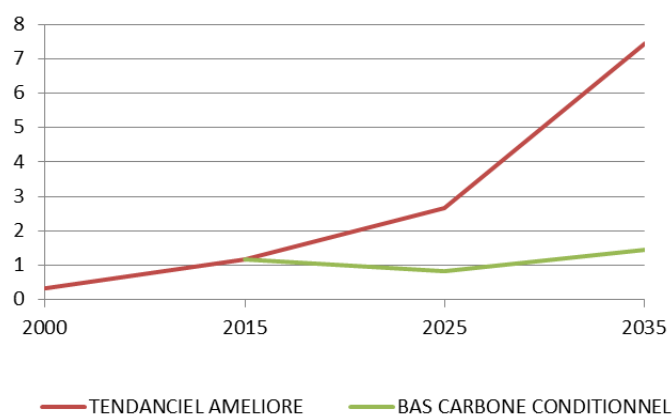
Hydrocarbures

Représentant 23% des émissions directes en 2000, les émissions liées au torchage du gaz associé à la production pétrolière ont fait l'objet de plusieurs mesures, cadrant avec la participation du Congo dès cette année à l'initiative « Zéro Torchage de Routine d'ici 2030 ». Le gaz non torché est en partie valorisé dans deux nouvelles centrales à gaz à Djéno (50MW) et à Côte Maltève (300MW). Cette politique, déjà entrée en vigueur, est prise en compte dans le scénario tendanciel. ²

Energie électrique

Le Congo dispose d'un important potentiel hydroélectrique estimé à environ 14000 MW dont à peine 228 MW (1,6%) est exploité. La République du Congo souhaite augmenter la part de l'électricité dans son mix énergétique, avec une cible d'environ 4 000 GWh consommés à horizon 2025. Sur cette base, le Congo a développé un plan ambitieux de développement de l'hydroélectricité, avec comme objectif d'assurer à horizon 2025 une fourniture de l'électricité à 85% d'origine hydroélectrique, et à 15% par le gaz. Enfin, le Congo développe également un plan d'électrification solaire des villages isolés (Stratégie énergétique du Congo 2015-2025).

Evolution des émissions de GES liées aux hydrocarbures (MteqCO₂)



Adaptation aux changements climatiques

La vision de la République du Congo, en matière d'adaptation au changement climatique **repose sur l'intégration de cette composante dans un schéma d'investissement cohérent** basé sur la stratégie de développement du pays, plutôt que sur des aides ou subventions ponctuelles et isolées, sans lien avec ladite stratégie. C'est la traduction de la vision consignée dans le Programme National de Développement du Congo (PND 2012-2016) : « Accélérer la modernisation de la société et l'industrialisation du pays ». La perspective est de générer une prospérité accrue et partagée comme fondement de l'émergence du Congo dans l'économie mondiale.

Le changement climatique constitue une menace pour la société, l'économie et l'environnement congolais. Les phénomènes météorologiques extrêmes, l'élévation du niveau de la mer, la hausse de température globale moyenne et les régimes pluviométriques imprévisibles ont des effets considérables sur les moyens de subsistance de la population. En conséquence, L'évolution des conditions climatiques met en péril la réalisation des objectifs de développement à moyen et à long terme, avec des conséquences extrêmes pour les groupes sociaux les plus vulnérables.

D'autre part, il est possible de transformer les défis du changement climatique en opportunités, en développant des politiques intégrées qui traitent en même temps la vulnérabilité à court terme et la résilience à long terme. Pour la République du Congo, l'adaptation aux variations et au changement climatique constitue la pierre angulaire de tout développement ou politique durable.

La République du Congo met en œuvre une approche sectorielle, adaptée aux circonstances locales des entités territoriales : zone côtière ou du littoral, plateau des cataractes et vallée du Niari, plaines alluviales du bassin du fleuve Congo, zones urbaines. Cette approche concerne les secteurs les plus vulnérables : l'hydrologie et les ressources en eau, l'énergie, l'agriculture, la forêt et la santé.

Les objectifs finaux de la République du Congo en termes d'adaptation aux changements climatiques qui doivent également trouver un écho auprès de la communauté internationale, se traduisent concrètement par :

La protection des populations : à travers une approche préventive de la gestion des risques, notamment dans les zones les plus menacées, qui s'appuie sur un système d'observation et de recherche pour mieux appréhender les risques climatiques actuels et à venir.

La stratégie d'adaptation de la zone côtière concourt à cette fin : cette stratégie se décline au travers de mesures visant à une gestion intégrée de la zone côtière par la mise en place d'un cadre juridique approprié, l'acquisition d'outils de surveillance et enfin la formation et l'information. Les orientations préconisent la réalisation d'un schéma d'aménagement du milieu urbain côtier, la promotion des activités génératrices de revenus liés aux écosystèmes marins et côtiers. A cela, il faut ajouter un dispositif comprenant des projets de conservations des mangroves pour la protection du littoral, la protection des espèces, la mise en place d'installations spécifiques pour la réception et la gestion des déchets, le suivi de la nidification des tortues marines et la création d'un observatoire du littoral et de l'environnement marin. La ville de Pointe-Noire, particulièrement exposée, fait l'objet de mesures de protection sur le littoral par des barrières physiques et des travaux de réhabilitation des berges.

La protection du patrimoine naturel, de la biodiversité, des forêts et des ressources halieutiques, à travers une approche d'adaptation ancrée dans la protection des écosystèmes.

Le Gouvernement congolais a créé à ce jour 17 aires protégées couvrant une superficie de 4.350.418 hectares, soit 13,2% du territoire national. Elles seront complétées par l'aire protégée de Ogoué Leketi.

La protection des systèmes productifs sensibles au changement climatique, comme l'agriculture. La République du Congo s'engage à restaurer les écosystèmes et à renforcer leur résilience, à lutter contre la dégradation des sols et des forêts, et à prévenir les inondations.

La protection des systèmes des infrastructures à fort risque. La ressource en eau étant l'un des facteurs limitant du développement de l'agriculture de la République du Congo, la stratégie sectorielle préconise sa gestion intégrée, la protection contre la pollution, la formation, la recherche scientifique et la sensibilisation autour de ces thématiques.

- **La protection du patrimoine immatériel de la République du Congo** à travers des actions d'éducation et de sensibilisations, ainsi que des efforts de conservation des bonnes pratiques ancestrales dans les secteurs hautement vulnérables, comme l'eau, l'électricité, l'agriculture, la biodiversité. Il convient également de mettre en œuvre une protection des innovations et de la propriété intellectuelle.
- **Le transfert des technologies climatiques** adapté aux priorités nationales de développement.

Ces objectifs de protection nécessaires à l'adaptation exigent :

- une nécessaire évaluation des besoins technologiques au niveau des secteurs prioritaires définis dans le projet de TCN, avec, principalement, l'appui de l'Entité Nationale Désignée (END) au Centre et Réseau des Ressources Technologiques (CRTC) de la CCNUCC et des autres partenaires stratégiques du pays ;
- la formation et l'accompagnement à l'appropriation des technologies climatiques dans les secteurs devant en bénéficier ;
- un transfert de technologies adaptées ;
- des mesures d'incitation pour l'agriculture en zone de savanes, telle que la facilité de mécanisation.

La République du Congo souhaite l'assistance de la communauté internationale dans le financement et l'assistance technique nécessaire à l'atteinte de ces objectifs, dans le cadre d'une stratégie intégrée adaptation-atténuation.

Financement et mise en œuvre

Les fonds nécessaires à la mise en œuvre du scénario bas carbone concernent principalement les infrastructures liées aux énergies renouvelables, les reboisements, l'amélioration des conditions de l'investissement pour une économie verte, et la formation à la bonne gouvernance. S'y ajoute ici le financement nécessaire de l'adaptation aux changements climatiques.

Montants financiers des mesures d'atténuation et d'adaptation

Les investissements et coûts représenteraient annuellement 3710 Milliards de CFA de 2014 à 2025, ou 5,14 Milliards d'€. L'autofinancement du pays pourrait atteindre 20%, soit 1,03 milliard d'€, (ou 656 milliards de FCFA). La communauté internationale serait sollicitée à hauteur de 5,14 milliards d'euros pour la période 2015-2025. Le tableau suivant synthétise le coût des mesures d'atténuation et d'adaptation, ainsi que le mode de financement envisagé.

FINANCEMENTS de la STRATEGIE BAS-CARBONE 2015-2025						
ACTION/INVESTISSEMENTS	Montants Totaux annuels (Millions de FCFA)	Montants Totaux annuels (Millions d'€)	Autofinancement annuel Congo (Millions d'€)	Financement international annuel total (Millions d'€)	dont dons annuels (Millions d'€)	dont Bonification de prêts (Millions d'€)
Amélioration des meules	28,5	0,04	0,009	0,035	0,03	0,0
Cacaoculture à faibles émissions	196	0,30	0,06	0,2	0,2	0,0
Plantations en plein en savane	35000	53,35	10,67	42,7	42,7	0,0
Implantation agroforesterie	30000	45,73	9,15	36,6	36,6	0,0
Formation agriculteurs	87,5	0,13	0,03	0,1	0,1	0,0
Agro industrie biocarburant	2130	3,25	0,65	2,6		2,6
Ménages (Foyers et gaz, solaire, centrales à bois)	100	0,15	0,03	0,1	0,1	0,0
	2498	3,81	0,76	3,0	3,0	0,0
	19600	29,88	5,98	23,9		23,9
Tramway	12000	18,29	3,66	14,6		14,6
Mines	2720	4,15	0,83	3,3		3,3
Autres industries Electrification	126000	192,07	38,41	153,7		153,7
Etudes préalables	106000	161,59	32,32	129,3		129,3
Adaptation	30790	46,94	9,39	37,5	37,5	0,0
Renforcement de capacité des décideurs	3400	5,18	1,04	4,1	4,1	0,0
Comité des investissements et de la bonne gouvernance	500	0,76	0,15	0,6	0,6	0,0
Total	371 050	566	113	453	125	327

Pendant les 5 premières années, ces fonds seraient mis à disposition du pays, sous le contrôle du comité précité, sous forme « START », sans conditionnalités et autres procédures de sauvegarde, du fait que les investissements concernés sont précisément des investissements environnementaux et sociaux à la fois.

Changements structurels pour la mise en place et la bonne gestion des fonds d'aide à l'économie verte

La Stratégie Nationale du Développement durable prévoit la mise en place d'un **Fonds National de Développement Durable (en plus du Fonds Forestier), fonds dédié à la promotion de l'économie verte dans toutes ses composantes, économiques et sociale en particulier**. La création de ce fonds est à l'étude et se positionnera dans la lignée des **Fonds Nationaux Climat** qui se développent dans divers pays, en tenant compte des particularités de la stratégie congolaise.

Un comité pour les investissements et la bonne gouvernance (CIG) sera mis en place avec pour tâches principales :

- d'assister la République du Congo pour la réussite de sa politique de développement à croissance rapide (avec objectifs, cibles et indicateurs) ;
- de conduire des études préalables à l'implantation du secteur privé ;
- de vérifier la bonne fin des crédits d'aide et des prêts internationaux ;
- d'assister à la Cour des Comptes et la remise régulière de rapports à un conseil de représentants du secteur privé et de la société civile sur la bonne gouvernance ;
- de lutter contre les lenteurs administratives en particulier pour les dossiers des investisseurs ;
- de former les élites à la bonne gouvernance et l'assistance à la lutte contre la corruption, notamment celle possiblement due aux investisseurs ;
- de servir de médiation en deuxième recours pour la fixation des prix entre les investisseurs privés et les coopératives de producteurs ;
- de proposer la fixation de quotas et de taxes pour les produits agricoles de première nécessité (en particulier les produits importés).

Ce comité serait dirigé par un représentant de la communauté internationale.

Ce comité ne serait en aucun cas un gouvernement bis mais resterait dans l'esprit d'une assistance, avec une déontologie stricte autant en matière financière qu'en matière de communication de documents et de discrétion dans les domaines à définir.



INTENDED NATIONALLY DETERMINED CONTRIBUTIONS

COOK ISLANDS

Introduction

The Cook Islands is a small island developing state comprising of 15 small islands with an exclusive economic zone (EEZ) of nearly 2 million sq km in the South Pacific Ocean. Globally, the Cook Islands contributes to only 0.00012% of GHG emission, which is an insignificant amount relative to the total global emission of 2004 (IPCC Report, 2007). Yet, collectively, the consequences of the global emission via climate change is detrimental to ecosystems, infrastructures, economy, and therefore the livelihood of Cook Islanders.

The Cook Islands has carved a pathway of low carbon development to strengthen climate resilience and further reduce its carbon footprint to achieve its national vision, which is *'to enjoy the highest quality of life consistent with the aspirations of our people, and in harmony with our culture and environment'*.

The Cook Islands believes that by aspiring to its national vision it is striving to keep the overall global average temperature rise below 1.5 degrees Celsius.

Mitigation

Based on the 2006 GHG inventory, the Cook Islands' emission was estimated at 69,574 t CO₂e, which contributes to 0.00012% of the 2004 global GHG emission (IPCC, 2007).

The energy sector alone contributed 79% of the total emission for 2006, with 34% attributed to electricity generation (Figure 1).

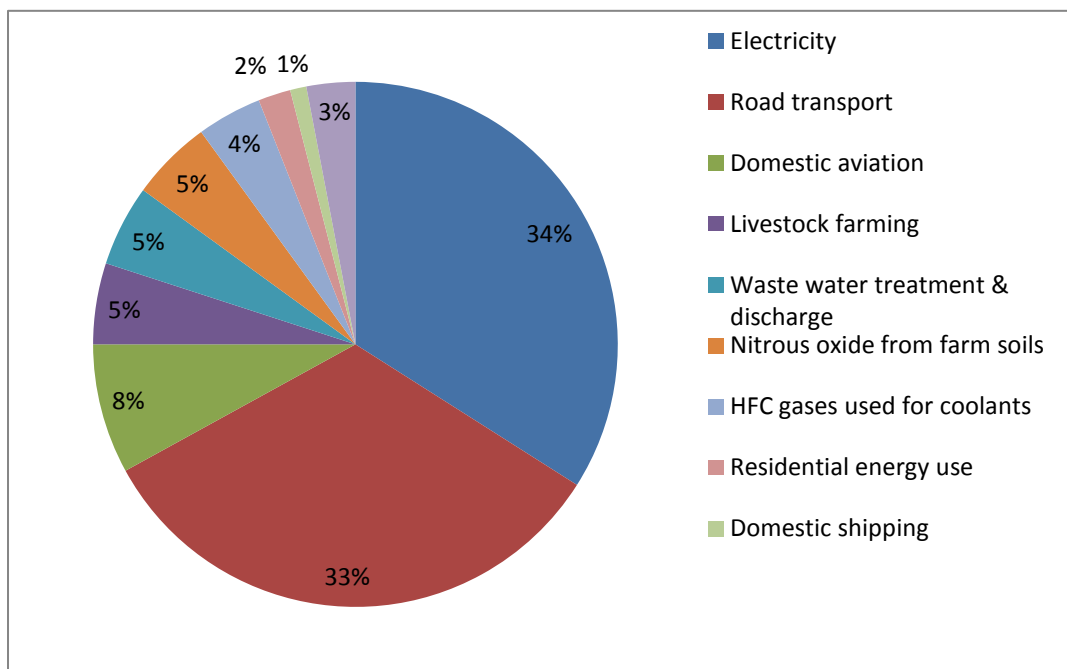


Figure 1. Breakdown in national emission by activity for 2006 (Second National Communications, 2011)

The Cook Islands is committed to a future powered by renewable energy with targets of 50% of islands transformed from diesel based to renewable sourced electricity by 2015, to 100% coverage by 2020 (Cook Islands Renewable Electricity Chart, 2011). To date, the Cook Islands has achieved its 50% target and is on track to achieving the 2020 target. Using 2006 as the base year, emission from electricity generation will be reduced by 38% by 2020 (Figure 2). The Cook Islands has formally submitted a Nationally Appropriate Mitigation Action (NAMA) under the United Nations Framework Convention on Climate Change for supporting implementation of 100% renewable electricity by 2020.

To ensure sustainability and the credibility of its efforts, the Cook Islands will endeavour to put in place the appropriate structures to monitor, evaluate and pursue value added activities. These will include *inter alia* undertake the construction of additional and new grid storage, integration of improved energy efficiency and new technologies, technology transfer, and strengthening capacities for overall sustainability and co-benefits. This would reduce emissions from electricity generation by a further 43%, totalling an 81% emissions reduction by 2030 (relative to 2006). This further reduction is conditional on receiving external support.

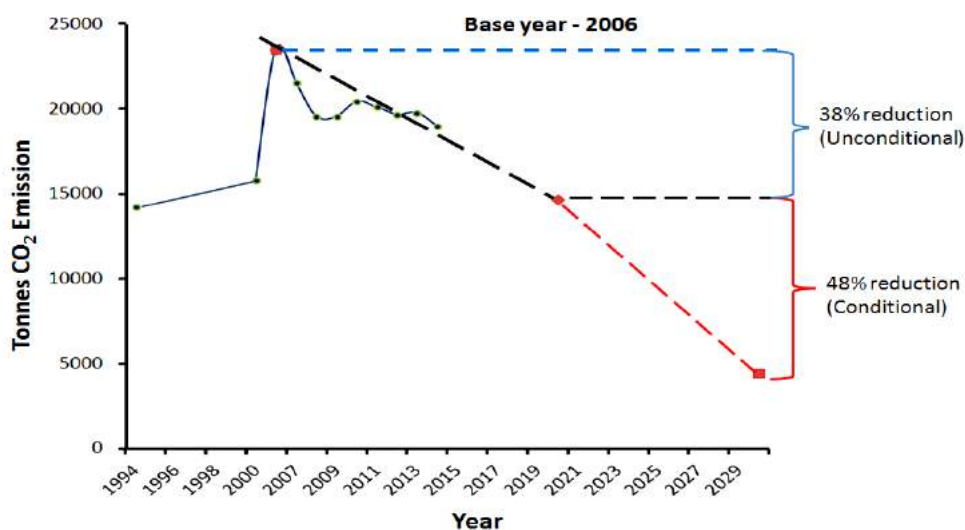


Figure 2. Electricity emission from 1994 to 2014. The Cook Islands base year is 2006 (blue dash line) and an unconditional target of 38% reduction by 2020. A conditional reduction of 43% by 2030, making a total reduction of 81% in the electricity sub sector.

Given that the transport sub sector is the second highest GHG emitter in the Cook Islands, the Customs Tariff Act 2012 establishes noteworthy duty rates on the importation of motor vehicles. Additionally, the Cook Islands is looking to embrace proven low carbon transport technologies and is currently exploring the most effective incentives for promotion of transition towards clean energy transportation. This will further reduce our overall emissions, conditional on external support.

Adaptation

Unconditional

Given the Cook Islands size, vulnerabilities, limited resources, and capacities whilst noting also its special circumstances, designating its entire EEZ of almost two million sq km as a marine park is evidence of national commitment to the global effort to building the resilience of marine ecosystems.

The country has developed key plans and policies that articulate its priorities to reduce vulnerability and strengthen resilience. This includes the first 20 year national vision '*Te Kaveinga Nui*', accompanied by the first National Sustainable Development Plan (NSDP) 2007-2010, and subsequently the second NSDP 2011-2015 with the latest 2015-2020 to follow. The Joint National Disaster Risk Management and Climate Change Adaptation Plan (JNAP) is a

five-year (2011–2015) roadmap that is currently being updated to 2020. The Climate and Disaster Compatible Development Policy 2013-2016, provide direction for more coordinated adaptation and mitigation actions within and across all sectors. The Renewable Energy Chart provides the pathway of transforming the electricity sector from diesel based to renewable energy sources.

The Cook Islands is confident that its existing frameworks and robust systems guiding ongoing climate change mitigation and adaptation measures are considerable, and its commitments are ambitious to the global goal despite its unique circumstances.

Conditional

Note that Loss and Damage is not factored into the policy and planning processes outlined above. Nor are the full costs associated with building resilience to climate change, which the Cook Islands expects will be covered by the international community over time.

The Cook Islands is confident that its strategies and policies pre 2020 and post 2020 will reduce and offset its carbon emissions and strengthen resilience. These actions include *inter alia* coastal protection, water security, agriculture, forestry, marine conservation, waste, tourism and land management.

The Cook Islands is confident that it can deliver 100 per cent of its adaptation measures, provide tools and technologies and strengthen capacities in all its inhabited islands, conditional to external support.

Cook Islands reserves the right to adjust this target and its parameters subject to the outcome of COP21 and to external support.

A fair and ambitious contribution under the Convention

Cook Islands intended nationally determined contribution is fair, ambitious and responsible given its special circumstances and considering that its total global GHG emission is negligible.

**Government of Costa Rica
Ministry of Environment and Energy**

**COSTA RICA's
INTENDED NATIONALLY DETERMINED CONTRIBUTION**



**San José,
September 2015**

A CLIMATE ACTION FOR A LOW EMISSION AND RESILIENT DEVELOPMENT

The changes in the world's climate are a reality happening today. It becomes clearer, every day, that this phenomenon will have a larger impact on the country's development, which is why, the National Development Plan sets, very clearly, climate change as cornerstone of every strategic action to be performed during the next four years. As part of our international commitment, Costa Rica is presenting its Intended Nationally Determined Contributions (INDC) under the United Nation's Convention framework for Climate Change, which defines our commitment to climate action from now and until the year 2030.

Costa Rica will center its climate change actions on increasing society's resilience to the impact of climate change and strengthening the country's capacity for a low emission development on the long term. Costa Rica will strengthen its climate action with efforts in reduction of emission of greenhouse effect gases, following scientific suggestions of what would be necessary to avoid the worst effect of climate change. Climate action will be based on balanced efforts of adaptation to ensure that communities, especially vulnerable communities, become resilient to the unavoidable impacts of climate change.

Costa Rica is looking into becoming a laboratory for the world's economy deep de-carbonization process, working with civil society, the private sector, academia, and the international community in order to accomplish it. Costa Rica has a long standing tradition of innovation on hydroelectric generation, in conservation and specially, on matters of climate change. This tradition is well evidenced in the country's commitment towards the United Nations' Framework Convention for Climate Change (CMNUCC), to avoid dangerous anthropogenic interference in the climate system and the goal of "keeping the average temperature increase leveled at 2° and consider reducing this limit to 1.5°". To accomplish it, global emissions of Greenhouse Gases (GHG) need to stay below a total of 1000 Giga-tons of CO₂ from 2012. Intended Nationally Determined Contributions (INDC) represent the effort each country is willing to commit to build a new climate regime past 2020, based on their capacity and reality. To stay within the limits recommended by scientists to be able to accomplish this goal, such regime would have to be ambitious, be legally binding, set a fair price for carbon and have the necessary means of implementation to address climate change challenges.

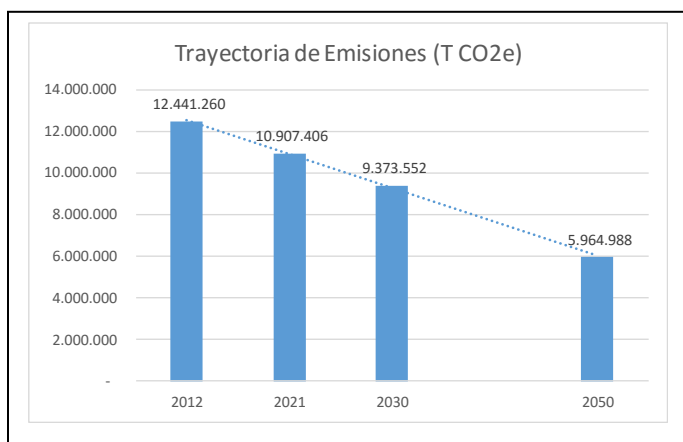
MITIGATION CONTRIBUTIONS

First, Costa Rica would like to reaffirm its aspiration of becoming a Carbon Neutral economy starting year 2021, as a culmination of its voluntary, pre-2020 action. Under this early action, Costa Rica proposed since 2007 to compensate its emissions through the removal or offsetting

by the forest sector. The goal proposed to achieve Carbon Neutrality by 2021 with total net emissions comparable to total emissions in 2005. Since then, the mitigation goals agreed by the Conference of the Parties have evolved, and the mitigation efforts must aspire to maintain the mean global temperature below 2°C. In this National Contribution, the date of 2021 will become the turning point Costa Rica's emissions, as a continuation of its voluntary action and a landmark in the path towards de-carbonizing the economy.

Second, the country is committed to a maximum of 9,374,000 T CO_{2eq} net emissions by 2030, with proposed emissions per capita of 1.73 net tons by 2030, 1.19 Net Tons per Capita by 2050 and -0.27 Net Tons per Capita by 2100. This numbers are consistent with the necessary global path to comply with 2°C goal. Costa Rica's commitment includes an emissions reduction of GHG of 44%, of a Business As Usual (BAU) scenario, and a reduction of 25% of emission compared to 2012 emissions. To accomplish this goal Costa Rica would have to reduce 170,500 tons of GHG per year until the year 2030.

Image 1. Total Net Emissions of GEG projected for Costa Rica 2012-2050¹



Projected Emissions

Proposed mitigation activities and context can be found in **Appendix 1**.

Type

¹ This chart is a lineal extrapolation of emission based on our Greenhouse Effect Gas National Inventory of 2012 and extended towards our goal in emissions for the year 2050. As a lineal representation, it shows a de-carbonization between 2012 and 2015 that has not happen. The numbers will be updated based on the Bi-annual Update (BUR) set for the end of 2015.

Maximum Net Emissions Limit for Greenhouse Gases.

Scope

100% of national emissions accounted for in the National Greenhouse Gas Inventory

Gases Included

- Carbon Dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF₆)

Period

January 1st, 2021 – December 31st, 2030

Absolut Maximum Limit

Net Emissions 9,374,000 TCO₂e by 2030

Transparency and Accountability

Costa Rica has adopted an Open Government policy. It is looking into strengthening accountability mechanisms, information access and availability, and citizen participation. The National Environmental Information System (SINIA) was created under the National Geo-Environmental Information Center (CENIGA) at the Ministry of Environment and Energy, and is hoping to promote an open data policy for all relevant climate information available for any citizen. There will be, as well, two open participation councils, one technical-scientific and one multi-stakeholder platform which will accompany the government's climate planning and management.

Methodological Approximations and Assumptions

- The Paris Agreement coming out of the COP21, will be legally binding for Costa Rica starting in 2020, and it will comply with the necessary requirements to achieve a low emissions development
- Costa Rica's emissions reduction goals will be driven by national scientific consensus, validated by the Intergovernmental Climate Change Panel's criteria. They may be modified as needed as new scientific information becomes available.
- National Contribution is based on two complementary methodology approaches, a deductive one, based on future emissions scenarios modeling (forecasting) and the other one, inductive, based on the emissions goal for 2050 and which, determines a lineal reduction of emissions necessary to accomplish it (backcasting).

- The AFOLU sector (agriculture, forestry, other land use) is included in the national goal for the Contribution. Costa Rica has been significantly improving metrics to quantify emissions and fixation in these sectors. Costa Rica will continue with improvements in metrics, deriving verifiable information through pilot actions such as NAMAs, Low Carbon Sector Strategies and the National REDD+ strategy, to define, with better accuracy, the sector contributions towards the National Contribution.

Using the International Market Mechanism

Costa Rica reserves its sovereign right to use international compensation units to accomplish its goals within the National Contribution or, as well, within its Domestic Compensation Market. Any compensation units traded abroad will be registered in the National Emissions Inventory to avoid double accounting.

CONTRIBUTION IN ADAPTATION

Costa Rica has included an Adaptation to Climate Change component in its National Contribution, with clear commitments for 2030. The country is currently designing a road map for its National Adaptation Plan, and is committed to develop it before 2018. The country will continue with its Green and Inclusive Development policy through local actions in adaptation, such as, *inter alia*, the strengthening of conservation programs and expanding the environmental services payments program to include Ecosystem based Adaptation. Also, Costa Rica will continue to promote renewable energies, integral environment management through agro-forestry systems and watershed management, as well as municipal land use planning as tools to lower long term vulnerabilities of its population, enhance its food security and the resilience of its infrastructure. Climate Change Adaptation will have as one of its components the National Disaster Risk Management Policy, through capacity building for resilience and technology transfer (refer to **Appendix 2** for more details on Contributions on Adaptation).

NATIONAL SETTING

Costa Rica has a century old tradition of investment in public education, and it's one of the few countries in Latin America to invest 8% of GDP in public education. This becomes a unique opportunity to use that installed capacity to educate Costa Rican citizens of today and strengthen university research to develop science and technology needed to support the mitigation and adaptation goals proposed in the National Contribution.

Over a century ago, Costa Rica, decided to take advantage of its hydro potential for generation, long before climate change was a critical element in decision making. Today, Costa Rica's installed capacity for electricity generation is predominantly renewable, a product of 115 years of public investment and innovating policies to supply electricity to more than 98% of Costa Ricans. In the 1970s, the National Park Service was created, today; its protected areas cover

25% of the territory and serve as an international tourism attraction, one of today's main income activities for the country. Costa Rica selected from very early moments a path of sustainable development to provide wellness to its citizens of today and the future. This path has taken the country in a continuous innovation and experimentation, where science has helped adjust periodically the public policy and development strategies' goals.

During the nineties, Costa Rica contributed to the global awareness on climate change, becoming part of the first joint implementation projects, helping use market tools and approaches to finance forestry activities even before the Kyoto Protocol's Clean Development Mechanism was adopted. Among some of these first projects, led to the internalization of environmental costs, through a pioneering Environmental Services Payment program (PSA). This last program became a world standard in matters of use of market mechanisms for forest conservation, which, together with the National Conservation Areas System (SINAC) and Forestry law #7575 of February 16th 1996, allowed Costa Rica to achieve a 52.4% of forest coverage by 2013. The total stock carbon stock, according to the national forestry inventory comes to 804,593,099 tons of carbon, 52% of which is contained underground. The additional carbon dioxide sequestration potential is being evaluated under the light of more detailed metrics, the role of results-based-payments for reduced emissions from deforestation and degradation, the role of increased carbon stocks, carbon stock conservation and sustainable forest management which must be adapted to emerging objectives and requirements.

Since 1990, Costa Rica has performed six emissions inventories for GHG led by the National Meteorology Institute (IMN). The definition of sound metrics based on methodologies sanctioned by the IPCC has helped build this national contribution based on accurate and verifiable data. A broad-based consultation process allowed for different sectors to provide inputs into this national effort, and be able to define their own internal policies for mitigation and adaptation.

In 2007, Costa Rica's National Climate Change Strategy was launched, supported by the creation of a Climate Change Department at the MINAE (Ministry of Environment and Energy), in charge of implementing and following up on international commitments and implementation of policies. Among these policies, Costa Rica announced its goal of achieving Carbon Neutrality by 2021, which aims to lower the country's net emissions to the levels of 2005. Through its C-Neutral Country Program, organizations may be awarded a C-Neutral Certification after submitting to an emissions assessment based on agreed standards and a reduction activities evaluation. This program offers the opportunity to compensate emissions, which could not be reduced due to financial balance or technology barriers, by offsetting them through investment in environmental services programs such as National Forestry Finance Fund (FONAFIFO). New options for compensation should be also made available through the Domestic Carbon Market of Costa Rica, which is in a pre-operation stage, by designing regulations, procedures and protocols. MINAE is developing the regulatory framework and designing which institutions would be responsible for domestic market regulation. Costa Rica reserves the right to use the Domestic Carbon Market as an instrument to accomplish its mitigation goals, as a complement to national and sectorial policies for emissions reduction.

The National Forestry Financing Fund (FONAFIFO) which the MINAE has been developing, since 2010, is currently developing its Emissions Reduction Program under the Carbon Fund (FCPF), known as the National REDD+ Strategy since 2010. Therefore, if Costa Rica receives payments for emission reduction from the Carbon Fund, it is expected for these carbon credits to be accounted starting in 2010. The metrics to assess the potential for removals through forest sinks in Costa Rica is currently under review and in continuous improvement by the country's authorities, this data will be adjusted as part of the preparation of the Emissions Reduction Program (ERPA) of the Carbon Fund (FCPF).

PLANNING PROCESS

As a pioneer country in the search for alternative ways for decarbonizing the economy, Costa Rica has a range of political instruments, both in mitigation and adaptation. In 2011, Costa Rica presented its Technological Needs Assessment (TNA) which posted a strategy for technological transfer and access to support greenhouse gas mitigation (GHG), and reduce vulnerability to adverse effects of climate change. In this evaluation, the following sectors and climate actions were prioritized: Public Transportation Integration and Decongestion, and Energy Conservation and Efficiency. In adaptation, two approaches were proposed, the adaptive co-management at the watershed level and detailed (sub-national) climate change scenarios. One of the approaches proposed with impacts both in mitigation and adaptation: Sustainable Agricultural Production.

Costa Rica has been reforming the structure of its Executive branch, especially, through the Environmental Law of 1995, which created the National Environmental Council. Almost a decade after this law, in 2014, a new structure for the executive branch was proposed, creating, among other organizations, the Environment, Energy, Sea and Land Use Sector Council, which brings together 14 autonomous and government organizations responsible for environmental policy. This Sectoral Council for the Environment has climate change and land use planning as its cornerstones. A Climate Change Department under the Strategic Planning Department of the Environment and Energy Ministry, will work as a Secretariat to the Inter-ministerial Council for Climate Change, facilitating coordination between ministries to implement national and sectorial climate policies. The Inter-ministerial Council for Climate Change was created through the Executive Decree #35669 of January 6th of 2010, which defines the MINAE's Organic Regulation and appoints MINAE's Climate Change Department as the entity in charge of implementing climate change policies.

The 2015-2018 National Development Plan sets the main policy objectives for the Solis Rivera Administration. In matters of climate change, the National Development Plan proposes as a strategic objective the promotion of actions against global climate change, through citizen participation, technology changes, innovation, research, and knowledge to guarantee security, human safety and the country's competitiveness.

For such purpose, under the 2015-2018 National Development Plan, there are two relevant results relevant to climate change policies:

1. Reduce climate change's impact and variability, increasing the adaptive capacity and disaster risk management, providing better resilience to vulnerable sectors.
2. Support the key sector emission reduction activities (transport, energy, agriculture, solid waste) to drive the low emission development transformation process to achieve the country's Carbon-neutral goal within National Contribution framework under the Climate Change Convention Framework of the United Nations.

As part of its "Open Government" policy, during 2015, a number of sector-wide dialogues were organized by Costa Rica's government, bringing together key stakeholders to discuss the country's greenhouse effect gas reduction goals, within the INDCs context. These dialogues have enabled a clearer definitions of the sectoral plans and programs needed to accomplish the country's climate action goals.

The Climate Change Policy derived from the acquired commitments within this National Contribution, has a multi-sector focus, since we all agree that climate change, more than just an environmental problem, is a development matter which requires effective climate actions through activities in the transportation, energy, forestry, agricultural, livestock and waste management sectors. This will require strengthening the inter-sectorial coordination platforms, such as, the National Environmental Council, the Environment, Energy, Sea and Land Use Sectorial Council, and the Inter-ministerial Council for Climate Change.

The VIIth National Energy Plan 2015-2030, sets a clear path towards a low emission development pathways by strengthening policies on energy efficiency and the promotion of renewable energies. Confirms the country's commitment to accomplish better energy efficiency, both in energy use and fuel end-use. In 2015, the Joint Commission between the Ministry of Environment and Energy and the Ministry of Agriculture was created to develop a common Agro-Environmental Agenda. The Vice-Ministries of Energy and Transportation have created an Ad-Hoc coordination mechanism which has allowed a better implementation of energy efficiency and mitigation policies within the transport sector. This change, within the country's energy sector, was fully supported during the sectorial round tables. MINAE has also launched its Biodiversity National Strategy, which will have important components and relevant action to the country's mitigation and adaptation goals. The National Action Plan was also used to fight land degradation, which will have significant contributions to rural environment management in mitigation and adaptation.

As previously mentioned, Costa Rica reserves the right to use market mechanisms to accomplish its mitigation goals. MINAE's Executive Decree #37926-MINAE of November 11th of 2013, creates a Carbon Board, and decrees the Operation and Regulation of the Domestic Carbon Market, and MINAE's decree #39099-MINAE of September 10th of 2015, outlining the Structure, Guidelines and Requirements to introduce actions into the Domestic Carbon Market and its digital access. These market mechanisms will be restructured to optimize them into an inter-sectorial implementation mechanism complementary to the previously mentioned

institutional management driven by National Contribution and the Post 2020 International Climate Regime.

In summary, the National Contribution will be implemented by the following entities:

1. Inter-Ministerial Council for Climate Change, which will allow to discuss, define, and follow up on climate change policies.
2. Ad-Hoc Operational Coordination Mechanism such as: Joint Commissions (agriculture and forestry, transportation and energy), which will coordinate the inter-sectorial implementation agendas under the National Climate Change Strategy.
3. MINAE's Climate Change Department, in charge of coordinating the implementation of the National Climate Change Strategy and supervising the definition of technical standards, closely coordinated with other sectorial directions and institutions related to MINAE (Energy Department, National Meteorological Institute, National Forestry Finance Fund, National Conservation Areas System, National Forestry Administration, among others).
4. The Climate Change Scientific Council will be created to advise the Environmental Sector Council, particularly its lead Ministry (MINAE). This Council will include international and national experts and academics, as well as members of the National Meteorological Institute (IMN), from the National Agricultural Technology Institute (INTA), from the National Council of Universities (CONARE), and from the National Geo-Environmental Information Center (CENIGA).
5. The Climate Change Citizen Consultation Council, which will create a permanent citizen participation forum on climate change, with wide private sector participation, organized civil society and academia to provide continuity to subjects and workgroups emerging from the sectorial forums in climate change.

MEANS OF IMPLEMENTATION

Under the Paris Agreement reached at COP21, Costa Rica will be part of, starting in 2016 and until 2020, a process of legal, institutional and organizational change in order to facilitate the implementation of this National Contribution starting in January 1st of 2021. The pre-2020 period will be critical to improve metrics, test new productive low emission practices through NAMAs and the low emission sector-wide development strategies, and to develop the National Adaptation Plan, and to fine tune and negotiate the regulatory and institutional framework required to be able to implement these new climate change policies. The 2015-2020 period will also be used to align the allocation of financial resources with the mitigation and adaptation goals proposed in the National Contribution.

Although Costa Rica has been able to sustain a Sustainable Development Policy over the past decades, this would not have been possible without access to adequate means of implementation. This National Contribution will require renewed efforts in the allocation of financial, technical and institutional capacity development in order to improve its emission reduction and climate change adaptation technology access.

In terms of financial resources, the emission reduction goal definition process, coordinated by MINAE, allowed for a first review of the marginal abatement costs of the identified main mitigation measures. This review will become an important input for the definition of investment priorities within the most critical sectors for mitigation, such as transportation, energy and agricultural sectors. As an example, the construction of an inter-city electric train will require both fiscal resources as well as external financial resources that will need to be developed. As well, a cost estimate of the main adaptation measures will be performed within the drafting of the National Adaptation Plan. Costa Rica has made headway in the Green Climate Fund (GCF), and its recently approved readiness program will help to create the institutional and fiduciary structures and mechanism required for managing this new fund. These methods include the development of the technical and scientific capacity of the country, with a co-investment in research and development.

Through the Scientific Council, the Citizen Consultation Council and other *ad hoc* entities, Costa Rica will review the metrics and goal agreed upon for emission reduction and define the dates for the sector's carbon neutrality, under a focus of continuous improvement. The Sectorial Dialogues on Climate Change organized during 2015 identified key measures for emission reduction by sector which will require additional policy planning and management processes supported on the inter-ministry coordination mechanisms mentioned above. These key climate change policies will build upon the consensus achieved within the different sectors on the road map for the National Contribution and will help deliver on the climate actions needed to make Costa Rica's de-carbonization pathway and its Climate Change Adaptation Plan a reality. We expect to take full advantage of the existing institutional mechanisms, while continuing with design, application and collaborative evaluation of climate policies. The government will confirm its role as a facilitator of enabling conditions which will allow the different sectors, communities and society in general define their mitigation and adaptation goals, based on their own economic, social and cultural, gender sensitive options for the wellbeing of a low emission economy.

EQUITY AND AMBITION

Costa Rica believes its contribution is ambitious because it proposes a transformation into a low emissions economy. We have to consider the wide range of climate actions, adopted from very early on, to align Costa Rica onto a path consistent with a resilient, low emissions development. The National Contribution looks to reinforce this historical commitment, increasing its emissions reduction goals to go beyond emission compensation from avoided deforestation, promote a low emission development, not only in the electricity sector, but also, in the transportation, agricultural and urban waste management sectors. Costa Rica's long term goal is challenging because it's looking to accomplish zero net emissions by 2085, with several opportunities to periodically review the national and sector strategies to ensure this long term goal.

Costa Rica's size located between two oceans make it a highly vulnerable country to the adverse impacts of climate change. The adaptation goals proposed in this National Contribution

try to confront the challenge of recurrent loss and damage due to extreme hydro-meteorological events. This National Contribution looks to strengthen the country's adaptation capacity, through an effective risk and adaptation management based in both the community and the ecosystems.

Both climate policies and the actions that derive from them will base themselves in the country's historical commitment to universal human rights and gender equality principles. Costa Rica favors a transformational approach to gender in public climate change policy, and supports the participation of women in policy making and climate actions implementation. This will require a full compliance with Cancun's safeguards on REDD, as well as, securing the indigenous people's Prior, Free and Informed Consent. Also, it's expected to increase citizen forums through the pre-2020 period to define the best climate governance arrangements to deliver on the commitments acquired in this National Contribution.

APPENDIX 1: MITIGATION OPTIONS

Costa Rica's transition into a resilient and low emissions economy will require an integrated focus on energy and climate policy, based not only, on a cost-benefit analysis, but also on a broader assessment of the social and environmental costs of a sustainable development pathway. The mitigation options proposed by Costa Rica in its National Contribution can be categorized into four broad policy options:

- Reducing energy demand and GHG emissions (Energy efficiency & conservation, low emissions development pathways)
- Decarbonizing energy supply (Electricity, liquids, gases)
- Fuel switching in end-uses (Buildings, transport, industry)
- Enhancing Carbon sinks (Land-use, reforestation)

In the National Emissions Inventory of 2010, emissions from the energy are mostly caused by fossil fuels used in electric generation. There are a lot of opportunities to work with the industrial sector on energy conservation and fuel switching in productive processes to reduce energy demand and decarbonize the energy supply. The VII National Energy Plan 2015-2030 defines energy efficiency and distributed generation as priorities. The hopeful goal of this contribution is to achieve and maintain a 100% renewable energy matrix by 2030. The increase in energy efficiency in residential and industrial consumption will result in a reduced electrical demand from these sectors. On the other hand, we anticipate an increase in electricity consumption in the transportation sector. Most of the proposed emissions abatement measures hinge on a greater use of electric transportation, both public and private. These measures had a greater level of consensus in the transport and energy sector dialogues. Public Transportation needs to improve its fleet composition as well as its working design. This can be accomplished through an Integrated Public Transportation system where routes are improved, train service strengthened, and availability of non-motorized transportation enhanced, etc. Costa Rica has made the intercity electric train a priority, which will provide a significant contribution to the country's emission mitigation goals, creating new employment and low emissions mobility. It is necessary to improve the freight sector through multi-modal options. This will require an ambitious investment portfolio in sustainable transportation over the coming decades.

The Costa Rican Agricultural sector is the second highest sector in compound emissions due to its Nitrous Oxide and Methane production. However, this is a sector that is looking earnestly into emission reduction through different measures which can both reduce emissions, while increasing productivity and the range of environmental services provided by agriculture and livestock production. During discussions with the agricultural sector, it was clear that an offer of environmental services requires investment, political will and a new inter-sectorial institutional arrangement. Among investment mechanisms available to improve acknowledgement of the agricultural sector's contribution to emission reduction, the market may play an important role in financing, at the farm level, additional mitigation efforts, with a payment for results scheme,

carbon auctions, and financial mechanism to promote initial investments and guarantee financial sustainability beyond international cooperation. The availability of credit and microcredit, as well as, incentives for clean energy use and water reductions will be critical to ensure the uptake of low emission technology development in the agricultural sector. To be able to develop market incentives and commercialization of agricultural products with lower carbon footprint, it is necessary to strengthen local and national markets, with timely access to information. As an effort to improve inter-sector practice of mitigation measures and metrics, Costa Rica is promoting its NAMA in the coffee sector, and developing NAMA proposals for livestock and biomass, and for a very important sector of its economy, the Small and Medium Enterprises. The National Low Carbon Livestock Strategy sets goals for the country's low carbon development in the milk and beef value chains, which will be benefited from technology and organizational innovation derived from the ongoing pilot programs within the Livestock NAMA. Other efforts such as the creation of a National Territorial Information System (SNIT), within the National Registry, should include land use change monitoring systems, which will significantly contribute to the Monitoring, Verifications and Reporting (MRV) systems improvement proposed under FONAFIFO's Emission Reduction Program.

Costa Rica is currently pursuing a green and inclusive development policy. The agricultural and forestry sectors share the same territory and require a harmonized environmental policy to be able to comply with rural development objectives, as well as, emission reduction and climate change adaptation. The integration of rural development agenda together with the REDD strategy will allow for an accurate and coordinated management of adaptation and mitigation actions in Costa Rican agriculture. FONAFIFO's payment for environmental services program has contributed to maintain a million hectares under forest cover, outside of protected areas. Although the potential emission reduction in the forestry sector is lower than the previous estimates due to the country's forest being mainly mature forests with high carbon stocks, and lower carbon fixing capacity. With this in mind, it is important to remember that the forestry and agricultural areas of the country provide a range of environmental services (water, biodiversity, soil conservation) that go beyond just carbon sequestration. Sector discussion and forums related to the REDD+ Strategy revealed a consensus about the need for improvement of the country's forestry resources governance, which will guarantee, over the long term, Costa Rica's capacity for generating wealth, as well as environmental goods and services. To accomplish this goal, there is need to clearly define the rights over forest resources, carbon, and other environmental services provided by forest and agricultural systems in Costa Rica. This goal needs to help manage forest health and set landscape natural restoration/regeneration objectives as an integral part of mitigation practice, while recognizing the adaptation co-benefits it may create. There are important synergies to be created between the agricultural sector, and the construction, tourism and industry sectors.

Solid waste is the third biggest emission source and is continuously growing. The publication of Official Urban Development Plan for the Metropolitan Area and the Land Use Planning National Policy, involve critical measures that have a bearing on GHG emissions. Costa Rica's has begun the design of a Low Emission Development Strategy for the urban sector, together with potential NAMAs in transportation and waste management, sustainable housing, all together

represent important steps to reduce emissions from cities. The strategies main stakeholders would be the Ministry of Housing (MIVAH), as the director for urban development, the Ministry of Health (MINSA), as the director in waste management, the Ministry of Environment and Energy and the municipalities around the country, especially those located in the metropolitan area of San José. The measures related to sustainable construction and targeted to reduce its carbon footprint, such as, construction waste reduction, through increased use of lumber, adoption of technology, new material and operations that are climate smart, combined with sustainable urban development measure may generate significant emission reductions. Among some of the abatement measures discussed during the sectoral dialogues, Integrated Waste Management was one that can help to address the growth in emissions from solid waste, which include waste segregation at the source and broader recycling and organic composting programs.

APPENDIX 2: ADAPTATION OPTIONS

Costa Rica defined in 2006, in its National Climate Change Strategy (ENCC), the strategic framework for climate change policies, setting six strategic pillars, Mitigation, Adaptation, Capacity Building, Financing, Public Awareness and Education, and Cultural Change, Metrics.

This commitment related to climate change adaptation is part of Costa Rica's National Contribution (INDC) under the United Nations' Framework for Climate Change, and will be reviewed in 2016 as part of the National Climate Change Strategy.

Costa Rica's vulnerabilities to Climate Change

In the past decades we have observed important changes in rainfall and increase of average temperature in Costa Rica, which adds to changes on land use and soil degradation processes. If the climate variability conditions continue to dominate the annual weather, there are multiple phenomena that may increase or lower their frequency or intensity. As a result, Costa Rica's weather will be subject to simultaneous extreme drought and extreme rain.

As a result of climate change, the impact of hydrological events continues to increase. Considering only direct loss, these extreme climate events have created economic losses estimated around 1.13 Billion US Dollars of 2011, representing damages for 2005-2011. Regarding impact to sectors, road infrastructure has experienced the biggest impact, followed by power distribution networks, agriculture and housing; four vital activities for country development. It is estimated that 78.2% of these damages are in public infrastructure, while the rest is private property. If the country continues to follow its current path, according to some studies, in 2030 losses will amount to more than 7 Billion US Dollars, accounted since 2006, and could reach by 2050 almost 30 Billion US Dollars. These losses are bound to have a greater impact on vulnerable groups like women, children and people in extreme poverty.

Costa Rica has published a number of vulnerability assessments in agriculture, biodiversity, infrastructure, food security, freshwater resources and coastline sectors. By far, the most vulnerable sectors are related to water supply and agriculture sector where increasing research and knowledge on climate change is considered a great challenge in order to increase their adaptation capacity. Ongoing efforts to develop adaptation measures for the water and biodiversity sectors, including the National Conservation Areas System (SINAC), have resulted in the launch of a National Ecosystem-based Adaptation Strategy. Increase focus will be given to building resilience from a sustainable development, food security and rural productivity perspective.

Costa Rica's Adaptation Action for 2016-2030

Starting from an acknowledgement that synergies between adaptation and mitigation activities are highly desirable, through development of concrete climate actions, Costa Rica assumes, for 2016-2030, the following commitments in adaptation:

Develop a National Adaptation Plan

Although since 2006, the country has a National Climate Change Strategy, it has not developed as yet a National Adaptation Plan. Costa Rica hereby assumes a commitment to have such a National Adaptation Plan ready by 2018, which will combine a sectoral and territorial focus, with at least ten plans for sectors and territories identified as priorities (Biodiversity, Agriculture, Water, Coastline, Fishery, Health, Infrastructure, Energy, Tourism, Cities), also, takes on the commitment to find sustainable financial sources to implement such plans.

Disaster Risk Reduction

Costa Rica has internationally committed, through the Geneva Pledge signed in February and endorsed by 20 other countries, to develop an exchange of experiences on matters of Human Rights and Climate Change. One of the main threats to human safety in Costa Rica comes from the impact of extreme weather events. Although Costa Rica has improved in the past years its disaster risk management policies, it continues to experience negative consequences caused by extreme weather events. Costa Rica is finalizing its National Disaster Risk Management Policy 2016-2030 with the following pillars Risk Reduction, Disaster Response and Readiness, and Disaster Recovery, with climate change adaptation as a cross-cutting issue.

Community Based Adaptation

Aware of the fact that adaptation has to be a community-led process. Community based Adaptation seek looking to empower the population to face climate change impacts, by increasing the resilience agriculture producers, developing safeguards for securing water supply and sustainable coastal zone development. Costa Rica is committed to promote Green and Inclusive Development (DVI), which favors the implementation of sustainable productive systems, in rural areas with lower human development indexes and vulnerable to climate change in priority productive territories over a 10 year period between 2016 and 2026. Since 2014, Fundecooperación has been implementing a program financed by the Adaptation Fund which will provide resources and technical assistance to over 30 community based adaptation projects. Learnings from these pilot projects will enable feedback into Costa Rica's National Adaptation Policy.

Ecosystem Based Adaptation

In the past 30 years the country has been able to revert one negative effect of the agro-exporter model which reduced forests, been able to shift from 26% forest coverage to a 54.4% by 2013. To accomplish this shift, the country developed several strategies, a National

Protected Area System (SINAC) was established which, today, covers 26.5% of the national territory, reforestation and private land forest management was promoted and facilitated, the Environmental Services Payment program was created and land use changes of forest lands were prohibited by law.

Costa Rica is committed to develop its adaptation practice from an ecosystem based adaptation focus, building on the commitment to increase forest coverage to 60%. At the same time, there are opportunities for exploring synergies between adaptation practices and the reduction of emissions through avoided deforestation. These include, inter alia, the consolidation of FONAFIFO's Environmental Services Payments program and the Forest Certification program as a mechanism to promote the sustainable development forest resources and effective protection of water sources for all 81 counties of Costa Rica; the promotion of the National Biological Corridor System and the National Protected Areas System (SINAC).

Local Planning and Management of Territory Adaptation

For several years the country has recognized the urgency of having a national land use planning organization that would help guide land use policies in accordance to capacity and sustainable use of natural resources. A territorial approach to urban growth management would help minimize environmental impact caused by human activity, reduce disaster risk, and enhance resilience to climate change, as well as, providing participative instruments for informed decision making at the local, municipal level. This Territory and Urban Planning Organization will constitute a tool to reduce vulnerability over the long term. Under this approach, Costa Rica commits to having in every city, by 2020, and every coastline county in the country, a land use plan which considers vulnerabilities to climate change and measures for increasing adaptation and mitigation.

Public Infrastructure Adaptation

Record on loss and damage due to extreme weather event show that public infrastructure is the sector that is most affected, that is why the country commits to have by 2020, the methods to identify and correct physical vulnerabilities on infrastructure and human settlements. This will be achieved through the design of a national vulnerability monitoring program for infrastructure during floods, drought, landslides and sea level rising which may all be aggravated by the adverse impacts of climate change.

Environmental Health as an Adaptation Measure

With the understanding that environmental health in all of its components (Basic Sanitation, Integrated Waste Management, Water Quality for human consumption, sewers, storm drains and dangerous substance controls) is a condition needed to reduce future vulnerabilities of human population and wildlife, Costa Rica commits to, by 2030, increase the sewer and storm drain coverage, maintenance and sustainability up to a 90%; and set an environmental health surveillance program, by 2018, to follow up on pathologies associated with climate change.

Capacity Building, Technology Transfer and financing Adaptation

To implement adaptation actions during 2016-2030 it's going to be necessary to identify sector and regional vulnerabilities, and establish priorities for targeting future studies and to develop practices to reduce these vulnerabilities. This will require processes to strengthen capacities and promoting a high degree of coordination and teamwork between different government and civil society entities. Existing inter-ministerial coordination efforts will be important to guarantee synergies between entities in order accomplish this. As part of its commitment to greater transparency and open data, Costa Rica will initiate the consolidation of information systems under the National Territory Information System (SNIT) and the National Geo-Environmental Information Center (CENIGA). This will also require increased capacities by the National Meteorological Institute to follow-up in real time, extreme weather event to consolidate and strengthen existing early warning systems in close cooperation program with the National Emergency Commission. Finally, this articulation between Disaster Risk Reduction and Adaptation Policies will require the country to develop specific methods and tools to evaluate climate change impact, vulnerabilities and adaptation of specific sectors and regions; promote technology transfer to help adaptation; and to increase country wide research budget on climate change.



CONTRIBUTIONS PREVUES DETERMINEES AU NIVEAU NATIONAL DE LA COTE D'IVOIRE

1. Contexte national

Données clés

Superficie	322 463 km ² - 550 Kilomètres de littoral
Climat	Sud : climat équatorial, chaud et humide. Nord : climat tropical plus sec
Population	22,67 millions dont 41,5% de moins de 15 ans (RGPH, 2014)
PNB	34,25 milliards USD (2014)
RNB/h	1 550 USD (2014)
Poids dans le PIB mondial	0,06% Parité de Pouvoir d'Achat (PPA) constant en 2011
Part de l'agriculture dans le PIB	24%
Consommation d'énergie primaire /h	0,64 tep en 2012
Accès à l'électricité	56% des ménages

Sources : RGPH 2014, PND 2016-2020, BAD, Banque Mondiale, EDS 2011-2012, AIE, PNIA 2010-2015

Après une décennie de crise politico-militaire qui a entraîné une profonde fracture sociale, la Côte d'Ivoire s'est donné pour objectif de devenir un pays émergent à l'horizon 2020. Pour impulser et coordonner les multiples facettes de son développement, la Côte d'Ivoire a renoué avec sa tradition de planification.

Le pays a également renoué avec une croissance rapide (de l'ordre de 8% par an), dans un contexte de paix, de sécurité fortement améliorée et d'une meilleure gouvernance. Les populations commencent également à tirer profit du dynamisme retrouvé, grâce aux efforts de redistribution et de correction des inégalités réalisés dans les différents secteurs.

Le PND 2016-2020 en cours de finalisation vise à consolider cette trajectoire vers l'émergence et l'industrialisation. Cette planification s'inscrit dans une vision à plus long-terme. L'Etude Nationale Prospective « Côte d'Ivoire 2040 » est également en voie de finalisation.

La stratégie nationale de développement du pays conjuguée à une forte croissance démographique conduirait à une augmentation substantielle des émissions de gaz à effet de serre (GES). En outre, la Côte d'Ivoire est vulnérable aux impacts du changement climatique qui touchent tous les secteurs essentiels de son développement.

Pour relever ces défis, la Côte d'Ivoire a mis en place en 2012 le Programme National Changement Climatique (PNCC) afin de coordonner, proposer et promouvoir des mesures et stratégies en matière de lutte contre les changements climatiques. Une Stratégie Nationale de Lutte contre les Changements Climatiques 2015-2020 a été adoptée fin 2014.

Au travers de cette Contribution Prévues Déterminées au niveau National (CPDN / INDC), la Côte d'Ivoire entend : marquer sa volonté de réduire l'empreinte carbone de son développement en privilégiant des options d'atténuation présentant des "co-bénéfices" élevés (**Section 2 : Atténuation**) ; renforcer la résilience du pays aux changements climatiques (**Section 3 : Adaptation**) ; mettre en cohérence ses politiques sectorielles et renforcer son dispositif et ses outils de mise en œuvre pour faciliter l'atteinte de ces objectifs (**Section 4**) ; et mobiliser à cet effet tous les moyens pertinents, notamment de financement, tant nationaux qu'internationaux (**Section 5**).

2. Atténuation

2.1. Contribution de la Côte d'Ivoire

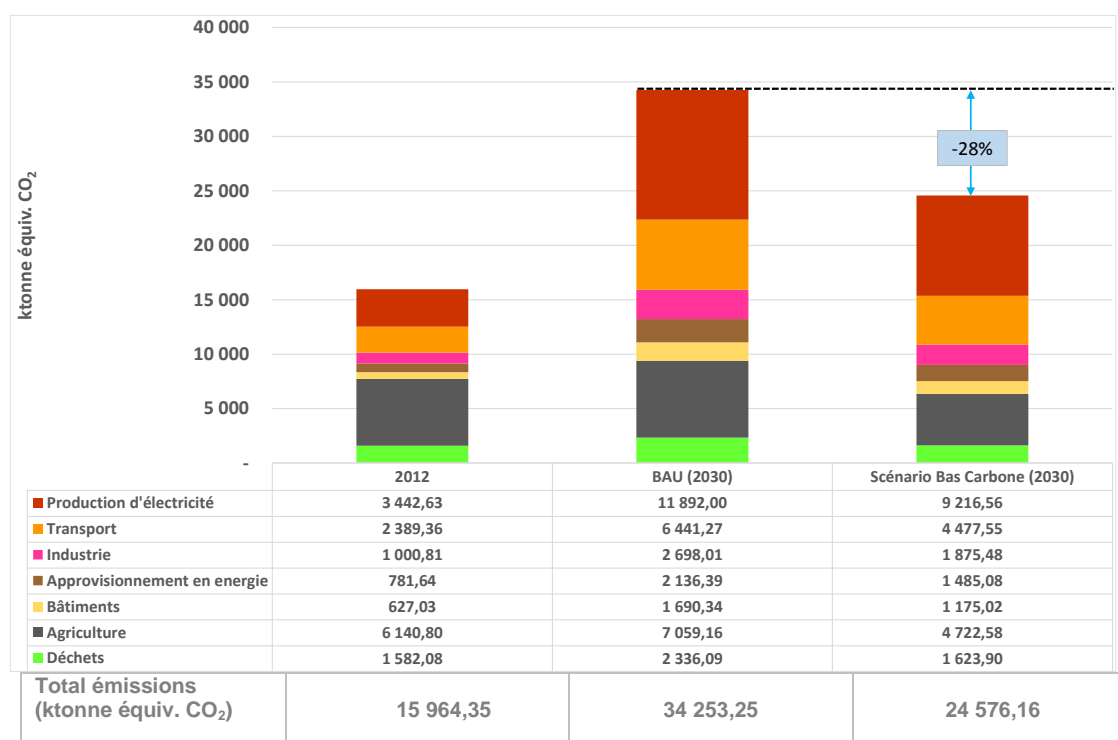
Tout en prenant en compte la nécessité de réduire les émissions de gaz à effet de serre, la Côte d'Ivoire, à l'instar des économies africaines doit relever le défi du développement afin d'améliorer le niveau et la qualité de vie de sa population. L'impérieuse nécessité de ce développement qui passe notamment par l'accroissement de la production agricole, la transformation agro-industrielle, la lutte contre la déforestation et la poursuite, voire l'accélération de la mise à disposition d'énergie moderne à tous les habitants, n'entame en rien la volonté politique du pays de contribuer à la réduction des émissions de GES. Toutefois, la Côte d'Ivoire a besoin d'être appuyée pour poursuivre la voie d'un développement durable, respectueux de l'environnement et soucieux des enjeux des changements climatiques.

Les INDC de la Côte d'Ivoire se déclinent donc en une contribution basée sur les efforts de réduction de GES contenus dans les plans stratégiques sectoriels de développement prévoyant l'appui des partenaires techniques et financiers.

Type de contribution	Combinaison d'objectifs et d'actions d'atténuation	
Objectif national à long terme sur les émissions de GES	Scénario bas carbone (2030)	Réduction des émissions de GES par rapport aux émissions de l'année cible (2030) dans un scénario de base (Business As Usual ou BAU).
Année cible	2030	
Année de base	2012	
Réduction cumulée des émissions d'ici 2030	Scénario bas carbone (2030)	-28%
Objectifs sectoriels	Scénario bas carbone (2030)	<ul style="list-style-type: none"> Composition du mix électrique : 26% de charbon, 32% de gaz naturel en cycle combiné, 26% d'hydroélectricité et 16% des autres énergies de sources renouvelables (EnR), soit un cumul de 42% d'EnR dans le mix électrique en 2030. Intensification et mécanisation de l'agriculture et de la production animale. Réduction des émissions de GES dues à la déforestation et à la dégradation des forêts. Gestion durable et valorisation des déchets.
Equité de la Contribution	- La Côte d'Ivoire est peu émettrice de GES avec seulement 0,81 tCO ₂ /hab (hors foresterie) - Le développement nécessaire de la Côte d'Ivoire (+8,4% de croissance du PIB d'ici 2030) s'accompagnerait d'une augmentation des émissions à 1,17 tCO ₂ /hab (+44,4%) en 2030.	
Ambition de la Contribution	La Côte d'Ivoire s'engage à : - Porter à 42% la part des EnR dans le mix électrique (incluant la grande hydroélectricité). - Mettre en œuvre la stratégie de réduction des émissions de GES issues de la déforestation et de la dégradation des forêts en plus de la gestion durable des forêts et des politiques ambitieuses de reboisement (REDD+). La baisse de 28% des émissions du scénario bas-carbone par rapport à un scénario de base (BAU) représente un effort significatif pour un pays dont le PIB/hab se situe au 148 ^{ème} rang mondial (2014, en base PPA).	
Polluants atmosphériques de courte durée de vie (PCDV/SLCP)	La Côte d'Ivoire s'est engagée à réduire les polluants atmosphériques de courte durée de vie ayant un impact sur le climat en plus des GES de longue durée. Le pays développera à cet effet, d'ici à 2018, un plan d'action national de réduction des PCDV / SLCP dont les contributions au réchauffement climatique sont clairement établies par le PNUE dans son rapport de 2011.	

2.2. Scénarios de base et de développement sobre en carbone

La figure ci-dessous présente (i) les émissions de l'année de base 2012, (ii) un scénario Business As Usual (cours normal des affaires) et (iii) un scénario de développement sobre en carbone montrant l'impact des grandes actions sectorielles dont la mise en œuvre pourrait être assujettie à des appuis extérieurs additionnels.



Le tableau ci-dessous présente les parts relatives des différents sous-secteurs dans les émissions de GES.

Sous-secteurs	2012	BAU (2030)		Scénario bas carbone (2030)	
	Emissions (ktonne Equiv. CO ₂)	Emissions (ktonne Equiv. CO ₂)	Pourcentage de hausse par rapport à 2012	Emission (ktonne Equiv. CO ₂)	Pourcentage de baisse par rapport à BAU
Production d'électricité	3 442,63	11 892,00	52,93	9 216,56	-7,81
Transport	2 389,36	6 441,27	25,38	4 477,55	-5,73
Industrie	1 000,81	2 698,01	10,63	1 875,48	-2,40
Approvisionnement en énergie	781,64	2 136,39	8,49	1 485,08	-1,90
Bâtiments	627,03	1 690,34	6,66	1 175,02	-1,50
Agriculture	6 140,80	7 059,16	5,75	4 722,57	-6,82
Déchets	1 582,08	2 336,09	4,72	1 623,90	-2,08
Total	15 964,35	34 253,25	114,56	24 576,16	-28,25

2.3. Hypothèses et approches méthodologiques

Type d'objectif	Réduction en % par rapport aux émissions de l'année cible dans un scénario de base.
Début de mise en œuvre de l'INDC	2016.
Couverture (du pays)	Tout le pays.
Gaz couverts	Dioxyde de carbone (CO ₂), Méthane (CH ₄), Oxyde nitreux (N ₂ O).
Secteurs/sources couverts	Agriculture, Energie, Déchets, UTCATF (Foresterie : non incluse dans les inventaires).
Scénario de base (BAU)	Ce scénario décrit l'évolution des émissions de GES à l'horizon 2030 par secteur d'activité en fonction des stratégies actuelles de développement du Gouvernement.
Scénario d'atténuation (bas carbone)	Ce scénario décrit l'évolution des émissions de GES à l'horizon 2030 sur la base d'orientations bas-carbone dans les principaux secteurs d'activité, notamment, énergie, agriculture et déchets.
Sources pour les scénarios (BAU et Bas carbone)	ENP 2040, PND 2016-2020, Plan Directeur Production et Transport d'Energie Electrique 2014-2030, PNIA 2010-2015, Politique industrielle (2013).
PRG	Les valeurs de PRG utilisées sont celles déterminées par le Groupe Intergouvernemental d'Experts sur l'évolution du Climat (GIEC, SAR).
Méthodologie de projection des émissions du scénario de base (BAU)	L'inventaire de l'année de base (2012) est celui de la Troisième Communication Nationale (TCN). Le scénario de base (BAU) est construit en appliquant aux émissions des différents secteurs des hypothèses d'évolution dépendant des taux de croissance annuels sectoriels, de l'évolution de la population, du mix électrique et de l'évolution tendancielle de l'efficacité du secteur.
Méthodologie de projection pour le scénario bas carbone	Le scénario bas carbone est construit en appliquant aux émissions sectorielles du scénario de base, une estimation des gains liés à la mise en place des politiques et projets du secteur.
Approche concernant les émissions relatives à l'Utilisation des Terre, Changements d'Affectation des Terre et Foresterie (UTCATF)	Les émissions de ce secteur important en Côte d'Ivoire devront faire l'objet d'une analyse plus précise d'ici à 2020 pour pouvoir être intégrées à l'objectif général. Cela pourra se faire grâce à la meilleure connaissance des superficies par type de sols grâce à l'imagerie satellitaire couplée avec l'exploitation des données de terrain.

2.4. Actions d'atténuation

La Côte d'Ivoire entend mettre en œuvre les Actions d'atténuation suivantes¹ :

Agriculture / Foresterie				
Grands enjeux de l'agriculture: (i) Recherche de l'autosuffisance et de la sécurité alimentaires et (ii) Amélioration de la productivité et de la compétitivité				
Grand enjeu du secteur forestier: Gestion durable des forêts et Objectif de 20% de couverture nationale forestière dans le Code forestier 2014				
<i>Message clef : Concept « Agriculture zéro déforestation »</i>				
Orientation	Mesures /actions	Co-bénéfices		
		Economiques	Sociaux	Environnementaux
Mise en cohérence de la planification nationale et de l'aménagement de l'espace rural pour développer l'agriculture et le secteur forestier	Mise en cohérence des Plans Nationaux d'Investissement Agricole (PNIA) avec les stratégies de limitation de la déforestation (processus REDD+) à travers un schéma directeur d'aménagement du territoire à 2030 (sécurisation du foncier) en concertation avec chacune des filières agricoles et les territoires	Bonification des avantages économiques du PNIA et des plans de développement forestier	- Réduction des conflits sociaux - Inclusion sociale	- Réduction des émissions de GES - Accroissement global du carbone forestier - Maintien de la biodiversité et des services écosystémiques
	Rédaction d'un schéma régional d'aménagement du territoire pour les différentes régions avec l'implication des communautés locales	Développement économique des régions	Réduction des conflits sociaux	Accroissement des services écosystémiques
	Délimitation des territoires villageois et matérialisation des limites avec des essences forestières	Maitrise du foncier et de la dynamique spatiale de l'occupation des terres	- Réduction des conflits sociaux - Inclusion sociale	Accroissement des services écosystémiques
	Sécurisation du foncier avec l'implication des interprofessions agricoles, des coopératives et du secteur privé pour faciliter les procédures et la réalisation d'économies d'échelle	Faciliter l'investissement dans le secteur de l'utilisation des terres	- Réduction des conflits sociaux - Cohésion sociale	Accroissement des services écosystémiques
Développement agricole sans extension sur les surfaces forestières restantes et moins émettrice de GES	Découplage de la production agricole et de la déforestation via la promotion de pratiques agricoles intensives à impacts réduits sur l'environnement et l'agroforesterie	- Amélioration de la productivité et de la création de richesses - Accroissement des rendements et revenus agricoles - Stimulation de la création d'industries légères à vocation agricole dans le milieu rural	- Effets positifs sur l'économie sociale : création d'emplois en milieu rural (environ 400 000 emplois agricoles attendus pour le PNIA en cours) - Réduction de la pauvreté	- Réduction des émissions de GES - Maintien des services écosystémiques
	Concrétisation du concept « Agriculture zéro déforestation » et valorisation des produits associés	- Amélioration de la productivité des facteurs	- Réduction des conflits sociaux - Création d'emploi	- Réduction des émissions de GES

¹ Ces actions sont formulées à un niveau élevé d'agrégation en cohérence avec l'esprit de l'INDC, qui ne doit pas consister en un catalogue de programmes et de projets. Un travail subséquent sera nécessaire pour traduire ces orientations en programmes opérationnels.

		naturels de production (terre, facteurs climatiques) - Accroissement des rendements et revenus agricoles	- Réduction de la pauvreté rurale - Réduction de l'exode des jeunes et rajeunissement du monde paysan	- Accroissement du carbone forestier - Maintien de la biodiversité et des services écosystémiques
	Développement des infrastructures de base qui permettront d'améliorer la logistique des transports de produits agricoles, d'élevage et de pisciculture	- Baisse des pertes post-récolte et accroissement des revenus - Stimulation de la création d'industries légères à vocation agricole dans le milieu rural	- Accroissement des emplois - Réduction de l'exode des jeunes et rajeunissement du monde paysan	
Intensification d'une production agricole, animale et halieutique respectueuse de l'environnement et permettant d'éviter la déforestation	Promotion et intensification de la production et de l'utilisation de semences à haut rendement et résistantes notamment aux facteurs climatiques et aux maladies (hors OGM et hybrides)	Accroissement de la productivité et des revenus	Création de chaînes de valeur durables et d'emplois	Réduction de la pression sur les terres agricoles
	Renforcement des partenariats et des collaborations sur l'analyse des sols pour améliorer leur productivité et améliorer la mise en œuvre des innovations agricoles	Accroissement de l'innovation agricole et des rendements	Création d'emplois	Maintien des services écosystémiques
	Rationalisation de l'utilisation des intrants chimiques et facilitation de l'emploi des intrants biologiques	Réduction des coûts médicaux liés à l'utilisation non contrôlée des intrants chimiques	Réduction des risques sanitaires liés aux intrants chimiques	Réduction des dommages environnementaux dus aux intrants chimiques
	Développement d'une mécanisation efficiente de l'agriculture et amélioration des infrastructures de conditionnement, de récolte et de conservation	Baisse des pertes post-récolte et accroissement des revenus	Création d'emploi	Maintien des services écosystémiques
Promotion des pratiques durables et intégrées permettant d'améliorer les capacités de production agricole et valoriser les ressources du milieu	Promotion de l'association agriculture-élevage, de l'agroforesterie, et de l'agriculture de conservation en particulier au niveau des plantations communautaires et privées	Accroissement des rendements et revenus agricoles	Réduction des conflits sociaux	Amélioration de la biodiversité
	Réduction maximale de la submersion rizicole permettant de limiter les émissions de méthane	Maintien des rendements agricoles	Maintien des emplois	Réduction des émissions de GES
	Gestion durable des sols organiques	- Amélioration de la productivité et de la création de richesses - Accroissement des rendements et revenus agricoles	- Réduction des conflits sociaux - Maintien des emplois	- Maintien des services écosystémiques
	Renforcement et vulgarisation des résultats de la recherche scientifique sur la gestion des ressources naturelles (notamment les sciences du sol et la physiologie pathologie et technologie post récolte)	Accroissement des rendements et revenus agricoles	- Réduction des conflits sociaux - Maintien des emplois	
Développement du secteur forestier à travers la gestion durable des	Mise en œuvre du mécanisme d'Applications des réglementations forestières, Gouvernance et Echanges commerciaux (FLEGT)	Relance de l'économie forestière	Amélioration de la gouvernance forestière	Maintien des services écosystémiques

forêts et l'amélioration de la Gouvernance forestière	Rédaction et mise en œuvre des plans d'aménagement et de gestion participative des forêts classées	Diversification des revenus des communautés locales	Participation des populations à la gestion des forêts	Maintien des services écosystémiques
	Stabilisation de l'extension des surfaces agricoles dans les forêts classées	Sécurisation du revenu des paysans	Création d'emplois	Préservation de la biodiversité
	Restauration des forêts classées avec l'implication des communautés locales	Diversification des revenus des communautés locales	Création d'emploi	Accroissement des stocks de carbone
	Renforcement de la gestion durable des forêts classées et des aires protégées, notamment grâce au suivi spatial des terres	- Maintien des rendements agricoles liés au micro climat - Stimulation d'activités écotouristiques	- Création d'emploi écotouristiques - Réduction de l'exode des jeunes	- Préservation et valorisation de la biodiversité et des habitats naturels - Maintien des services écosystémiques
	Facilitation de la réhabilitation des terres dégradées et du reboisement des zones de savanes, et renforcer les stocks de carbone dans les forêts dégradées à travers la promotion du reboisement villageois	- Diversification des sources de revenus - Crédit carbone disponible	- Réduction des conflits sociaux - Accroissement des emplois - Réduction de l'exode des jeunes et rajeunissement du monde paysan	- Restauration de la biodiversité et des habitats naturels - Accroissement des services écosystémiques
	Mise en place d'un système d'incitation de type paiement pour service environnementaux (PSE) afin encourager le reboisement villageois et la conservation des forêts naturelles dans le domaine rural et soutenir les petits producteurs à adopter des pratiques de production durable	Accroissement des revenus des communautés	Création d'emploi	- Accroissement des stocks de carbone - Accroissement des services écosystémiques
Développement de solutions énergétiques domestiques durables pour les besoins de cuisson des populations	Reboisement avec des essences à croissance rapide à vocation bois énergie ; Promotion de foyers améliorés et Promotion des alternatives en charbon de bois à travers la valorisation de la biomasse agricole	Diversification des revenus des communautés locales	- Création d'emploi vert - Amélioration des conditions de vie de la femme en milieu rural	Réduction des émissions de GES
Coûts	Le coût global du PNIA 2010-2015 est évalué à 2 040 milliards de FCFA, dont 1 565 milliards pour la période 2012 - 2015 (même ordre de grandeur pour PNIA 2016-2020). L'orientation bas carbone des futurs plans devra être distillée sur toutes les composantes			

Energie/Transport

Grands enjeux de l'énergie :

(i) Améliorer l'accès des populations à l'électricité et à l'énergie à un prix accessible ; et (ii) Accroître l'utilisation des énergies renouvelables dans la production d'électricité

Message clef : « 42 % d'énergies renouvelables incluant la grande hydroélectricité dans le mix électrique »

Orientation	Mesures /actions	Effets /Bénéfices		
		Economiques	Sociaux	Environnementaux
Maîtrise de la consommation énergétique des systèmes par une politique d'efficacité énergétique volontariste incluant les EnR	Mesures transversales			
	Investissement dans l'efficacité énergétique et amélioration du taux de participation des EnR dans le mix électrique à l'horizon 2030	<ul style="list-style-type: none"> - Gains de productivité et amélioration de la compétitivité - Diversification des sources d'énergie primaire - Réduction de la dépendance vis-à-vis des énergies fossiles - Amélioration de l'accès à des sources d'énergie sûre et abondante 	<ul style="list-style-type: none"> - Développement de nouvelles filières d'emplois qualifiés - Impact sur la santé et amélioration de la qualité de vie - Réduction des conflits sociaux - Amélioration des taux de couverture et d'accès des populations aux services énergétiques 	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
	Mise en place d'un cadre institutionnel et réglementaire en matière d'EnR et d'efficacité énergétique	Amélioration de l'environnement autour du secteur énergétique	<ul style="list-style-type: none"> - Développement de nouvelles filières d'emplois qualifiés - Réduction des conflits sociaux - Amélioration des taux de couverture et d'accès des populations aux services énergétiques 	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
	Renforcement de l'intégration de la Côte d'Ivoire dans le marché Régional de l'Energie, à travers l'interconnexion avec les autres pays de la région	<ul style="list-style-type: none"> - Accroissement du revenu national - Renforcement de la part de la Côte d'Ivoire dans le PIB de l'UEMOA 	<ul style="list-style-type: none"> - Amélioration de la qualité de vie - Réduction des conflits sociaux - Amélioration des taux de couverture et d'accès des populations aux services énergétiques 	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
	Mesures sous-sectorielles : Industrie			
	Mise en place d'une stratégie de réduction des gaspillages dans la consommation énergétique des industries à travers : <ul style="list-style-type: none"> - le diagnostic ou l'audit énergétique pour établir un bilan de la consommation et des usages énergétiques ; - le comptage pour disposer de données fiables et continues sur la consommation. 	<ul style="list-style-type: none"> - Gains de productivité - Amélioration de la compétitivité - Réduction de la facture énergétique 	<ul style="list-style-type: none"> - Développement de nouvelles filières d'emplois qualifiés - Gains de revenus 	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de l'empreinte écologique
	Encouragement des entreprises à investir dans des équipements énergétiquement plus performants	<ul style="list-style-type: none"> - Gains de productivité - Amélioration de la compétitivité - Réduction de la facture énergétique 	Développement de nouvelles filières d'emplois qualifiés	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles

	Evaluer les potentiels de substitution ou d'optimisation (par exemple cogénération ou valorisation) ;	<ul style="list-style-type: none"> - Gains de productivité - Amélioration de la compétitivité - Réduction de la facture énergétique 	Développement de nouvelles filières d'emplois qualifiés	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
Mesures sous-sectorielles : Sous-secteur Bâtiments				
	Développement d'une réglementation nationale sur l'efficacité thermique des bâtiments (construction et rénovation)	<ul style="list-style-type: none"> - Réduction de la facture énergétique - Gains de revenus 	<ul style="list-style-type: none"> - Développement de nouvelles filières d'emplois qualifiés - Amélioration de la qualité de vie 	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
	Formation de tous les acteurs de la chaîne de valeur à la construction basse consommation	<ul style="list-style-type: none"> - Réduction de la facture énergétique - Gains de revenus 	Développement de nouvelles filières d'emplois qualifiés	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
Mesures sous-sectorielles : Sous-secteur Transports				
	Amélioration de la mobilité et développement des offres de transport bas-carbone	<ul style="list-style-type: none"> - Réduction de la facture énergétique - Gains de revenus 	Amélioration de la qualité de vie	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
	Intégration d'une dimension énergie/climat dans les documents de planification territoriale afin de limiter les distances, de travailler sur la mixité fonctionnelle et de proposer des politiques de transport en commun efficiente	<ul style="list-style-type: none"> - Réduction de la facture énergétique - Gains de revenus 	Amélioration de la qualité de vie	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
	Accompagnement des communes dans l'élaboration de plans de transport urbain (exemple du train urbain dans le district d'Abidjan)	<ul style="list-style-type: none"> - Réduction de la facture énergétique - Gains de revenus 	Amélioration de la qualité de vie	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
	Facilitation de l'achat de véhicules peu polluants et mise au rebut des plus polluants via des normes, incitations ou obligations	<ul style="list-style-type: none"> - Réduction de la facture énergétique - Gains de revenus 	Amélioration de la qualité de vie	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles
Développement de la production d'énergie à partir de sources renouvelables	Mettre en place un cadre incitatif pour le développement des énergies renouvelables (appel d'offre, FIT, défiscalisation, ...)	<ul style="list-style-type: none"> - Diversification des sources d'énergie primaire - Réduction de la dépendance énergétique vis-à-vis des énergies fossiles - Amélioration de l'accès à des sources d'énergie sûre et abondante 	<ul style="list-style-type: none"> - Développement de nouvelles filières d'emplois qualifiés - Impact sur la santé et amélioration de la qualité de vie - Réduction des conflits sociaux 	<ul style="list-style-type: none"> - Réduction des niveaux d'émissions de GES, notamment de CO₂ - Diminution de la pression sur les ressources naturelles

	Lever les barrières à l'investissement (renforcement du cadre institutionnel, sécurisation des investissements, formation des banques, ...)	- Gains de productivité et amélioration de la compétitivité de l'économie	- Développement de nouvelles filières d'emplois qualifiés - Impact sur la santé et amélioration de la qualité de vie - Réduction des conflits sociaux	- Réduction des niveaux d'émissions de GES, notamment de CO ₂ - Diminution de la pression sur les ressources naturelles
	Investir dans la R&D, notamment par le renforcement des capacités de l'Institut de Recherche sur les Energies Renouvelables (IREN) et évaluer l'opportunité de créer une Agence de Promotion des Energies Renouvelables	- Elargissement du champ de connaissances sur l'efficacité énergétique - Amélioration de la compétitivité de l'économie	- Développement de nouvelles filières d'emplois qualifiés - Amélioration de la qualité de vie - Réduction des conflits sociaux	- Réduction des niveaux d'émissions de GES, notamment de CO ₂ - Diminution de la pression sur les ressources naturelles
	Faciliter le développement de projets sur les filières pertinentes: - Petite hydroélectricité - Méthanisation (déchets, résidus agricoles...) - Photovoltaïque (promotion des Kits PV solaire, système de pompage PV...) - Biomasse (exploitation durable de bois énergie)	- Elargissement du champ de connaissances sur l'efficacité énergétique - Gains de revenus - Amélioration de la compétitivité de l'économie	- Développement de nouvelles filières d'emplois qualifiés - Amélioration de la qualité de vie - Réduction des conflits sociaux	- Réduction des niveaux d'émissions de GES, notamment de CO ₂ - Diminution de la pression sur les ressources naturelles

Déchets

Grands enjeux des déchets :

(i) Améliorer la salubrité urbaine ; et (ii) Assurer la gestion durable et la valorisation des déchets

Orientations	Mesures/actions	Effets/Bénéfices		
		Economiques	Sociaux	Environnementaux
Valorisation efficiente des ressources pour tendre vers une économie circulaire	Développer et mettre en œuvre une politique et une stratégie de gestion durable des déchets incluant l'aspect valorisation	- Accroissement des revenus et de la richesse nationale - Contribution à la modernisation de l'économie et gains de productivité	- Développement de nouvelles filières d'emplois - Amélioration de la qualité de vie des populations - Réduction des conflits sociaux	- Réduction des niveaux d'émissions de GES ; - Amélioration de la qualité de l'environnement - Diminution des pressions sur les ressources naturelles
	Développer des actions d'économie circulaire : - Eco-conception des produits - Récupération/utilisation et recyclage des déchets (agricoles, forestiers et ménagers) - Compostage - Valorisation des eaux usées	- Accroissement des revenus et de la richesse nationale - Contribution à la modernisation de l'économie et gains de productivité	- Développement de nouvelles filières d'emplois - Amélioration de la qualité de vie des populations - Réduction des conflits sociaux	- Réduction des niveaux d'émissions de GES ; - Amélioration de la qualité de l'environnement - Diminution des pressions sur les ressources naturelles
Coûts	Le Plan Directeur Production et Transport d'Énergie Électrique 2014-2030 précise que le montant total des investissements production-transport pour la période 2014-2030, s'élève à 8 000 milliards FCFA. Les investissements additionnels liés au secteur minier coûteraient en outre près de 1 600 Milliards FCFA.			

3. Adaptation

Cadre de l'action	Description				
Impacts et vulnérabilité	<p><u>Impacts</u> : inondations, tempêtes, glissements de terrain, sécheresses-canicules, feux de brousse, baisse du débit des fleuves et amenuisement du volume des eaux de surface, raccourcissement de la durée moyenne des périodes de croissance végétative et exposition accrue des plantes au stress hydrique, faible croissance de la biomasse végétale, réduction des potentialités productives des écosystèmes, diminution des terres arables due à leur dégradation, érosion côtière jusqu'à 3 mètres par an pouvant atteindre 6 à 12 mètres lors de tempêtes, atténuation du phénomène de l'<i>upwelling saisonnier</i> ont des impacts sur : agriculture et élevage, utilisation des terres, forêts, ressources en eau, énergie, zones côtières, pêche, infrastructures (habitats), transport, santé publique et genre.</p> <p>Onze secteurs vulnérables indiqués en mai 2013 par le Ministre de l'Environnement, de la Salubrité Urbaine et du Développement Durable (MINESUDD) dans le but de proposer un Plan National d'Adaptation</p> <table border="1"> <thead> <tr> <th>Vulnérabilité forte</th> <th>Vulnérabilité moyenne ou faible:</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Agriculture/Elevage/Aquaculture • Utilisation des terres • Forêts • Ressources en eau • Energie • Zones côtières </td> <td> <ul style="list-style-type: none"> • Pêche • Infrastructures (habitats) • Transport (routes) • Santé publique • Genre </td> </tr> </tbody> </table>	Vulnérabilité forte	Vulnérabilité moyenne ou faible:	<ul style="list-style-type: none"> • Agriculture/Elevage/Aquaculture • Utilisation des terres • Forêts • Ressources en eau • Energie • Zones côtières 	<ul style="list-style-type: none"> • Pêche • Infrastructures (habitats) • Transport (routes) • Santé publique • Genre
Vulnérabilité forte	Vulnérabilité moyenne ou faible:				
<ul style="list-style-type: none"> • Agriculture/Elevage/Aquaculture • Utilisation des terres • Forêts • Ressources en eau • Energie • Zones côtières 	<ul style="list-style-type: none"> • Pêche • Infrastructures (habitats) • Transport (routes) • Santé publique • Genre 				
Actions à planifier pour un développement résilient au climat	<p><u>SECTORIELLES</u></p> <p>Ressources en eau : Maîtriser et gérer les ressources en eau (renforcement de la planification et de la coordination des bassins versants, développement de barrages agropastoraux, aménagement de nouveaux sites hydro-agricoles et de retenues d'eau, amélioration de l'efficacité de l'irrigation, valorisation des eaux pluviales et de crues...</p> <p>Agriculture / Elevage /Pêche : Améliorer les technologies de production, renforcer les capacités des acteurs</p> <p>Forêts et utilisation des terres : améliorer les espèces sylvicoles, promouvoir le reboisement et l'agro-écologie, restaurer les terres dégradées, promouvoir les techniques d'amélioration de la fertilité et de la conservation des sols</p> <p>Zones côtières : Réglementer la construction et l'extraction de sable sur le littoral, déménager et reconstruire les ouvrages en danger sur une ligne de repli, construire des ouvrages de protection active (épis, brise-lames), passive, de restauration (rideaux pare vent, revégétalisation, voire reboisement –mangroves-).</p> <p>Energie : Organiser la filière bois-énergie, éviter l'ensablement des cours d'eau, reprofiler et restaurer les écoulements dans les lits mineurs des cours d'eau. Vulgariser la construction et l'usage des foyers améliorés en milieu rural</p>				
Pertes et dommages	<p>Pertes humaines : pertes liées aux catastrophes hydrométéorologiques, maladies vectorielles (aux maladies –paludisme, maladies hydriques, maladies respiratoires) et liées aux feux de brousse ;</p> <p>Pertes liées à l'érosion côtière : Coûts compris entre 2,355 à 6,75 milliards de FCFA (4,0 à 6,75 millions d'US \$) pour les pertes de terre en cas de submersion comprise entre 0,5 et 2 mètres</p> <p>Pertes productions agricoles (au minimum 10 % de la production rizicole annuelle soit 50 milliards de FCFA ou 85,6 millions d'US \$ -basé sur le coût de l'importation de riz-, 10 % de la production cacaoyère annuelle, soit environ 202 millions d'US \$ établi sur le prix de l'exportation du cacao, « destruction d'importantes surfaces de palmiers à huile et de coco dans les régions d'Abidjan. Précision à faire</p> <p>Pertes en infrastructures (habitations, routes, etc.).</p> <p>« La réduction des ressources en eau et l'incidence sur la production de nourriture ainsi que sur l'habitat sont à évaluer, de même que les incidences sur la santé publique ».</p>				
Obstacles, lacunes et besoins pour réussir les actions d'adaptation	<p><u>Obstacles</u> :</p> <ul style="list-style-type: none"> - le manque d'intégration des politiques des changements climatiques dans les politiques nationales et sectorielles - la faible capacité des moyens d'existence (physique, national, social, institutionnel,...) des communautés rurales <p><u>Lacunes</u> :</p> <ul style="list-style-type: none"> - la faible compréhension du concept des changements climatiques. - l'analphabétisme. <p><u>Besoins</u> :</p>				

- le renforcement des capacités humaines, institutionnelles, techniques, financières et le transfert des technologies.

Activités	Objectifs et Description	Co-bénéfices	Coût (milliards de FCFA ou millions de US\$)
Ressources en eau			
Maîtriser et gérer les ressources en eau	<p>Réduire la vulnérabilité et accroître la résilience</p> <ul style="list-style-type: none"> - Mettre en œuvre la Gestion Intégrée des Ressources en Eau (GIRE) - Mettre en œuvre pour les bassins versants (BV) nationaux et renforcer pour les BV transfrontaliers la planification et la coordination - Développer les barrages agropastoraux pour faciliter l'abreuvement du cheptel - Aménager des sites hydro-agricoles et des retenues d'eau pour améliorer les productions vivrières - Améliorer l'efficacité de l'irrigation pour limiter la consommation d'eau - Valoriser les eaux pluviales et de crues (captage et stockage des eaux de ruissellement) - Renforcer les capacités des paysans et autres utilisateurs en matière d'irrigation 	<ul style="list-style-type: none"> - Planification des productions permettant la stabilisation des prix à la consommation et des revenus des producteurs - Les retenues d'eau permettent d'augmenter les ressources halieutiques, d'évoluer vers des systèmes de production intégrés - Disponibilité en eau potable suffisante pour les besoins humains 	<p>PNIA (Aménager les terres pour les cultures intensives 84,86 milliards de FCFA – US \$14,3 millions-, faciliter l'accès au petit matériel d'irrigation, 1,8 milliards de FCFA – US \$ 3,03 millions -, réaliser les aménagements hydro-agricoles 28,37 milliards de FCFA – US \$ 47,8 millions-, appuyer la maintenance des aménagements et équipements d'irrigation 0,6 milliards de FCFA – US \$ 0,1 millions-, réhabiliter les barrages pastoraux et les retenues d'eau 3 milliards de FCFA. –US \$ 5,05 millions</p>
Agriculture			
Renforcer les productions agricoles, animales et halieutiques (secteur agricole 23 % du PIB sur la période 2000-2013)	<p>Réduire la vulnérabilité et accroître la résilience</p> <ul style="list-style-type: none"> - Développer l'approche agro-écologique (pratiques de gestion de la fertilité des sols, développement de l'utilisation des engrais organiques et du compost issus des déchets ménagers, l'association agriculture-élevage) - Améliorer les technologies de production grâce à l'accès aux intrants améliorés et adaptés (semences vivrières, fourragères, sylvicoles résistantes à la sécheresse, banque de gènes animale, alevins de qualité, gestion du fumier et du compost pour améliorer la fertilité des sols, etc.) - Développer les unités de stockage et de conservation pour limiter les pertes élevées post-récolte - Promouvoir et vulgariser des espèces cultivées résilientes au changement climatique - Développer les prévisions saisonnières qui renforcent la résilience au changement climatique des pratiques culturales - Favoriser l'accès des femmes au foncier rural 	<ul style="list-style-type: none"> - Autosuffisance alimentaire grâce à une amélioration des rendements (30 % pour le riz avec des semences améliorés) - Lutte contre la pauvreté et maintien de la paix sociale par l'amélioration du pouvoir d'achat des communautés rurales, la création d'emplois doit être un point entier. - Réduction de la dépendance aux importations et amélioration des exportations des produits agricoles (SNDCV indique 40 % des recettes d'exportation) - Prise en compte de l'aspect genre (femmes) 	<p>SNDCV (plan de développement semencier agricole 12,05 milliards de FCFA –US \$ 20,3 millions, appui direct aux activités de production 540 milliards de FCFA –US \$ 909,9 millions)</p> <p>SNDR (appui technique à la production –semences riz, intrants et mécanisation : 299 milliards de FCFA – US \$ 503,8 millions).</p> <p>PSDEPA (amélioration de la productivité et de la compétitivité 80,948 milliards de FCFA – US \$ 136,4 millions dont 2,18 milliards – US \$ 3,7 millions- pour la production de fourrage et de semences, préservation de la diversité génétique aquacole 7,45 milliards de FCFA – US \$ 12,6 millions)</p>
Forêts et utilisation des terres			
Lutter contre la déforestation	<p>Réduire la vulnérabilité et accroître la résilience</p>	<ul style="list-style-type: none"> - Lutte contre la pauvreté (exploitation des produits forestiers non ligneux, 	<p>PF (Réduction de l'impact changement climatique 33,64 milliards de FCFA.- US \$ 20 millions)</p>

et la dégradation des terres	<ul style="list-style-type: none"> -Améliorer les espèces sylvicoles, promouvoir l'agroforesterie, restaurer les terres dégradées. -Promouvoir la gestion durable des terres par les techniques d'amélioration de la conservation des eaux et du sol (CES). - Développer l'approche paysagère pour la gestion durable des terres et la conservation des eaux et des sols. 	<ul style="list-style-type: none"> amélioration des rendements agricoles, recours à la pharmacopée traditionnelle). -Préservation de la diversité faunique et floristique terrestre. - Durabilité de la qualité des sols 	<p>PNIA (appuyer la diffusion d'innovations technologiques 0,43 milliards de FCFA –US \$ 0,7 millions-, techniques CES 5 milliards de FCFA –US \$ 8,4 millions-).</p>
Gestion des catastrophes hydrométéorologique			
Construire la résilience notamment par la lutte contre l'érosion côtière	<p>Réduire la vulnérabilité et accroître la résilience, notamment pour la section Sassandra - Vridi – Port- Bouët</p> <ul style="list-style-type: none"> - Evaluer les risques hydrométéorologiques et mettre en œuvre les mesures d'atténuation - Mettre en place un système d'alertes multirisques - Mettre en place un plan de contingence et des plans de réponse efficaces - Informer, éduquer et communiquer sur les risques hydrométéorologiques - Renforcer les capacités des acteurs en matière de Réduction des Risques de Catastrophes (RRC) et de gestion de catastrophes - Evaluer de manière systématique les pertes et dommages et assurer le relèvement et la construction post-catastrophe - Développer l'observation du trait de côte et identifier les territoires à risque d'érosion (surveillance de l'érosion côtière). -Protéger l'habitat (faire appliquer la réglementation sur la construction et l'extraction de sable sur le littoral, déménager et reconstruire les ouvrages en danger sur une ligne de repli, construire des ouvrages de protection active -épis, brise-lames, passive, de restauration -rideaux pare vent, revégétalisation, voire reboisement –mangroves-). -Mettre en place un fonds microprojets expérimentaux de protection locale contre l'érosion 	<ul style="list-style-type: none"> - Préservation de l'agriculture (zone de plantations de palmiers à huile, d'ananas, de bananiers, d'hévéas et de cocotiers). - Préservation de la diversité biologique lagunaire et côtière. - Préservation de l'habitat - Préservation des zones côtières vulnérables 	<p>SACCL (modélisation dynamique du profil littoral 0,184 milliard de FCFA –US \$ 0,31 million-, reboisement de mangroves et autres espèces appropriées 0,65 milliard de FCFA –US \$ 1,1 millions, mise en place d'un fonds 1,95 milliards de FCFA –US \$ 3,3 millions-.</p> <p>SACCL considère secondaire l'aménagement contre l'érosion à Assinie 19,97 milliards FCFA –US \$ 33,6-, autour du canal de Vridi, l'ouverture de la sortie du Comoé 22,55 milliards de FCFA –US \$ 38 millions-.</p>

4. Processus de planification, mise en œuvre et suivi de l'INDC

La Côte d'Ivoire prendra les mesures suivantes pour mettre en œuvre ces INDC, en assurer le suivi et le cas échéant l'actualisation/révision².

	Description	Objectif
Cadre législatif et réglementaire	Adoption de textes juridiques relatifs à la mise en œuvre, au suivi-évaluation des INDC et aux résolutions de la Conférence des Parties à la CCNUCC.	Pérenniser les actions de développement sobre en carbone à travers les divers gouvernements successifs
Cadre institutionnel	Création d'un Comité Interministériel des Changements Climatiques (CICC) réunissant les ministres en charge des secteurs pertinents, présidé par le Premier Ministre et chargé notamment du suivi de la mise en œuvre des INDC	Assurer une mise en œuvre efficace d'une politique nationale transversale en matière de climat
	Création d'un Secrétariat du CICC (SCICC) ancré au MINESUDD et chargé d'appuyer techniquement le CICC dans la planification, la coordination de la mise en œuvre, le suivi et l'évaluation des INDC et doté d'une feuille de route claire calée sur la périodicité des PND	
Opérationnalisation des INDC	Evaluation de l'impact climat de toute loi ou politique/programme/projet public nouveau (étude d'impact)	Intégrer les considérations d'atténuation et d'adaptation dans les processus de décision publique
	Traduction des INDC en programmes opérationnels sectoriels articulés avec/repris dans le PND	Opérationnaliser les INDC notamment via le processus de planification nationale
	Intégration des Changements Climatiques (CC) dans la planification nationale (PND) et les politiques sectorielles ainsi que la planification locale.	Mettre en cohérence les PND et les plans et politiques sectoriels (par exemple PNIA) en particulier avec la réduction des risques de catastrophes naturelles avec les objectifs et actions d'atténuation et d'adaptation du pays formulés dans ces INDC
	Quelques études complémentaires (à réaliser après soumission des INDC) : - Consolider l'inventaire national des émissions de GES - Affiner les coûts des Actions des INDC - Renforcer la connaissance de l'utilisation et de la gestion des terres en Côte d'Ivoire (images satellites + enquête terrain) - Etudier le potentiel d'EnR en Côte d'Ivoire ³ - Elaborer une stratégie climat-énergie - Etudier le renforcement de la prise en compte de l'énergie et du climat dans la politique agricole en prévision de l'élaboration du PNIAC [Plan National d'Investissement Agriculture et Climat] 2020-2030 - Proposer un réseau optimal de référence de surveillance de variations de niveaux de nappes d'eau à partir de piézomètres existants traduisant la relation climat / régime hydrologique des cours d'eau - Etudier l'opportunité d'un prix et d'un marché carbone au niveau domestique et régional (cf. infra)	Chiffrer et affiner la description des Actions d'atténuation et d'adaptation des INDC
	Etude de la faisabilité d'un système de codage des dépenses liées au CC dans le budget de l'Etat	Suivi des recettes et dépense climat dans le budget national
	- Amélioration des systèmes d'établissement et de collecte des données sur les émissions de GES - Réalisation d'un inventaire annuel de GES	Obtenir des données fiables sur les émissions de GES
	Création d'un Observatoire de la qualité de l'air (CO, SO, etc.) et de suivi des GES	Suivi de la qualité de l'air
	Renforcement des actions de recherche-développement et de transfert en matière de technologies propres.	
	Communication	- Démarrage d'une campagne de communication fin 2015 sur les INDC et la COP 21, notamment en direction du secteur privé et des collectivités territoriales ; - Renforcement des capacités des acteurs locaux avant les campagnes de sensibilisation ; - Mise en place d'un site internet dédié sur la politique nationale en matière de changement climatique / INDC où les indicateurs supra seront publiés
Actualisation/Révision des INDC	Périodicité : Révision à la lumière des résultats de la COP21, si nécessaire. Tous les 5 ans en lien avec le PND sauf indication contraire issue des COP Responsable : Secrétariat SCICC	

² Selon l'issue des négociations sur l'élaboration d'un nouvel accord international sur le climat.

³ LA Côte d'Ivoire mène actuellement une étude sur le potentiel de la bioénergie.

5. Moyens de mise en œuvre

Financement	<i>La Côte d'Ivoire entend mobiliser les sources suivantes pour financer les Actions d'atténuation et d'adaptation de ces INDC :</i>	
	<i>Finance privée</i>	La Côte d'Ivoire entend mobiliser des financements privés internationaux ou domestiques (fonds propres et prêts) dans toute la mesure du possible pour le co-financement d'actions pertinentes de ces INDC, particulièrement les actions pouvant générer une rentabilité financière acceptable pour le secteur privé. A cet effet, la Côte d'Ivoire s'attachera à augmenter le taux de bancarisation, stimuler la formation de l'épargne, et renforcer les marchés financiers et système bancaire domestiques, ainsi que l'attractivité de la Côte d'Ivoire pour les investissements étrangers (climat des investissements)
	<i>Budget national</i>	La Côte d'Ivoire prendra sa part dans le financement des actions de ces INDC qui relèvent du budget de l'Etat. Cet effort de l'Etat peut prendre la forme soit de dépenses budgétaires directes soit transiter par des fonds spécifiques financés notamment à partir du budget de l'Etat.
	<i>Bailleurs de fonds / PTF</i>	La Côte d'Ivoire sollicitera l'appui des bailleurs de fonds et PTF (dons, prêts et assistance technique) pour le financement des actions de ces INDC. L'accès aux prêts souverains des Institutions financières de développement (IFD) sera crucial.
	<i>Fonds vert pour le climat</i>	La Côte d'Ivoire réfléchit à l'opportunité de mettre en place une entité nationale accréditée au Fonds Vert pour le Climat (FVC). Elle a déjà entrepris son processus de préparation pour l'opérationnalisation du FVC au niveau national (Readiness Programme)
	<i>Marchés du carbone</i>	La Côte d'Ivoire soutient l'inclusion des marchés internationaux du carbone tels que le Mécanisme pour un Développement Propre (MDP) dans un accord post 2020 sur le climat et propose qu'un tel instrument, couplé à un régime comptable approprié (MRV), puisse être utilisé pour aider à financer certains investissements dans les infrastructures sobres en carbone et résilientes au changement climatique. La Côte d'Ivoire considère que certaines des options de développement sobres en carbone contenues dans ces INDC, ou des actions supplémentaires, pourraient être financées entièrement ou en partie, par le transfert international d'actifs carbone en tenant compte des considérations d'intégrité de l'environnement et de transparence.
	<i>Autres instruments économiques</i>	L'opportunité de déployer des outils permettant de générer un signal prix sur le coût social du carbone (marché ou taxe carbone) et ainsi d'internaliser l'externalité carbone sera explorée
	<i>Première tranche quinquennale</i>	Une première tranche quinquennale d'Actions à financer est en préparation et sera présentée lors du 4 ^{ème} trimestre de 2015. Elle sera cohérente avec, et reflétée dans, le PND 2016-2020.
Renforcement des capacités	Atténuation	<ul style="list-style-type: none"> - A tous les niveaux : lien entre développement, réduction de risques de catastrophes naturelles, énergie et changement climatique - Pour les décideurs : intérêts d'intégrer la réflexion énergie-climat dans toutes les politiques sectorielles - Pour les opérateurs: mise en œuvre du développement bas-carbone, par exemple : <ul style="list-style-type: none"> <u>Agriculteurs</u> : Pratiques agricoles permettant une intensification soutenable de la production ; modes de gestion et valorisation des résidus agricoles. <u>Entrepreneurs</u> : Les clefs du succès pour développer un projet d'énergie renouvelable en milieu rural ; valorisation de produits issus d'une agriculture soutenable.
	Adaptation	<p>Le renforcement des capacités des acteurs (surtout femmes, agriculteurs, etc.) porte sur de nouveaux itinéraires techniques dans le cadre des modes de productions intensifiés et durables.</p> <p><i>Informé, éduquer et communiquer sur les risques climatiques</i></p> <ul style="list-style-type: none"> - Renforcer le système d'observation des phénomènes météorologiques à travers les stations synoptiques - Mettre en place un système d'alertes précoces multi-risques - Renforcer les capacités nationales et locales en matière de réduction des risques de catastrophes et de préparations d'urgence en cas de catastrophes <p><i>Système de Gestion de l'Information Environnementale</i></p> <ul style="list-style-type: none"> -Créer un centre de gestion de la qualité de l'air chargé des activités suivantes : <ul style="list-style-type: none"> - Assurer la veille sur la pollution de l'air ambiant - Evaluer les rejets de polluants à la source - Informer le public sur l'état de la qualité de l'air - Fournir à l'État des rapports sur la pollution de l'air pour une prise de décision - Favoriser la mise en place d'un observatoire de la qualité de l'air - Renforcer la coopération régionale et internationale dans le domaine de la qualité de l'air

		<ul style="list-style-type: none"> - Former un(e) responsable de cet observatoire / centre de gestion de la qualité de l'air. - Créer un réseau d'observation et de suivi de la dynamique du trait de côte à l'échelle nationale afin d'identifier les territoires à risque d'érosion côtière et examen d'un ou de plusieurs indicateurs traduisant la relation climat / érosion côtière
Transferts et développement de technologie, R&D	<ul style="list-style-type: none"> - Développement des partenariats entre les entreprises et les centres de recherche sur le développement de solutions bas-carbone. - Meilleur accès à des outils (par exemple calage des cycles culturels à la saison pluvieuse) 	

6. Annexes

Principales abréviations

BAD	Banque Africaine de Développement
CC	Changements Climatiques
CES	Conservation des Eaux et du Sol
COP	Conférence des Parties (à la CCNUCC)
CPDN	Contribution Prévues Déterminées au plan National
EE	Efficacité Energétique
ENP	Etude Nationale Prospective Côte d'Ivoire 2040
EnR	Energies renouvelables
FCFA	Franc CFA
GES	Gaz à Effet de Serre
IFD	Institutions Financières de Développement
INDC	Intended Nationally Determined Contribution (CPDN)
IREN	Institut de Recherche sur les Energies Renouvelables
NAMAs	Nationally Appropriate Mitigation Actions
OCDE	Organisation pour la Coopération Economique et le Développement
PF	Politique Forestière et Plan Stratégique de mise en œuvre
PIB	Produit Intérieur Brut
PND	Plan National de Développement
PNIA	Plan National d'Investissement Agricole
PNUE	Programme des Nations Unies pour l'Environnement
PPA	Parité de Pouvoir d'Achat (Purchasing Power Parity)
PSDEPA	Plan Stratégique Développement de l'Elevage, de la Pêche et de l'Aquaculture
PTF	Partenaires Techniques et Financiers
REDD+	Réduction des Emissions des GES issus de la Déforestation et de la Dégradation des forêts (Reduced Emissions from Deforestation and Forest Degradation)
SACCL	Stratégie d'Adaptation au Changement Climatique sur le Littoral de Côte d'Ivoire
SCECCI	Stratégie de Gestion de l'Environnement Côtier en Côte d'Ivoire et Plan d'Action National
SNDCV	Stratégie Nationale de Développement Cultures Vivrières autres que le Riz
SNDR	Stratégie Nationale révisée de Développement de la filière Riz
US \$	Dollar des Etats Unis
UTCATF	Utilisation des terres, changements d'affectation des terres et forêts

Références

Général/transversal	
Planification	<ul style="list-style-type: none"> - Plan national de développement (PND) 2012-2015 - Projet de PND 2016-2020 - Etude Nationale Prospective « Côte d'Ivoire 2040 » (projet)
Données pays	<ul style="list-style-type: none"> - Fiche pays BAD et Délégation de l'Union européenne - Enquête démographique et de santé et à indicateurs multiples 2011-2012 (juin 2013)
Atténuation	
Général	<ul style="list-style-type: none"> - Première communication nationale auprès de la CCNUCC de 2000 - Deuxième communication nationale auprès de la CCNUCC de 2010 - Projet de Troisième communication nationale (en cours de finalisation)
Agriculture	<ul style="list-style-type: none"> - PNIA 2010-2015 - Stratégies filières (SNDR, SNDCV, 3e Plan Palmier, Plan Hévéa, Plan Cacao)
Energie	<ul style="list-style-type: none"> - Code de l'électricité - Projet de Plan Directeur Production et Transport d'Energie Electrique 2014-2030 - Plan d'Action pour les Energies Renouvelables (PANER), - Plan d'Action pour l'Efficacité Energétique (PANEE) - Agenda d'Action pour l'Énergie Durable Pour Tous (SE4ALL)
Forêt	<ul style="list-style-type: none"> - Nouveau code de la forêt 2014 - ONU-REDD+ (R-PP)
Industrie	<ul style="list-style-type: none"> - Politique industrielle
Adaptation	
Cadre de l'action	<ul style="list-style-type: none"> - Plan National de Développement 2011-2015 et 2016-2020 (PND). - Programme National d'Investissement Agricole 2010-2015 (PNIA). - Stratégie Nationale de Développement Cultures Vivrières autres que le riz 2013-2020 (SNDCV). - Stratégie nationale révisée de développement de la filière riz 2012-2020 (SNDR) - Plan stratégique développement de l'élevage, de la pêche et de l'aquaculture 2014-2020 (PSDEPA) - Stratégie de Gestion de l'Environnement Côtier en Côte d'Ivoire et Plan d'Action National 2016-2020 (SGECCI) de 2015. - Communication Nationale initiale de la Côte d'Ivoire à la CCNUCC (2000) - Deuxième Communication Nationale de la Côte d'Ivoire à la CCNUCC (2010) - Programme National Changement Climatique 2015-2020 (PNCC). - Politique nationale de l'environnement 2011.
Vulnérabilité	<ul style="list-style-type: none"> - ABBOTT, P. (2013), Filières cacao et coton en Afrique de l'Ouest: Rôles des politiques et des institutions dans l'intégration des petits agriculteurs aux systèmes des marchés, Dans : Reconstruire le potentiel alimentaire de l'Afrique de l'Ouest, A. Elbehri (ed.), FAO/FIDA. - AHOSSANE K., JALLOH A., NELSON G., THOMAS T.S. (2012) : Agriculture Ouest Africaine et changement climatique : analyse exhaustive – Côte d'Ivoire. - AGBRI L. (2014) : L'agriculture intelligente face au climat en Côte d'Ivoire : état des lieux et besoins d'appui pour mieux intégrer l'agriculture intelligente face au climat (AIC) dans le PNIA. - YAO N'GUETTIA R. (2013) : Etude de la vulnérabilité du secteur agricole face aux changements climatiques en Côte d'Ivoire www.rti.ci/infos_Politique.html du 22 05 2013) http://www.gcca.eu/fr/intra-acp/climate-support-facility/cote-divoire-definition-dun-cadre-institutionnel-de-mise-en
Actions	<ul style="list-style-type: none"> - Centre du commerce international (2011) : Coton et changement climatique, impacts et options de réduction et d'adaptation. - FIDA (2014) : Projet d'appui à la production agricole et à la commercialisation – extension Ouest (PROPACOM-Ouest). Rapport de conception finale. Rapport principal et appendices. - SALVA-TERRA (2013) : Etude coûts - bénéfices de la REDD+ en Côte d'Ivoire et mobilisation des acteurs des grandes filières agricoles et forestières. - Stratégie d'adaptation au CC pour le littoral de Côte d'Ivoire, 2012.

REPÚBLICA DE CUBA
CONTRIBUCIÓN NACIONALMENTE DETERMINADA
CONVENCIÓN MARCO DE LAS NACIONES UNIDAS
SOBRE EL CAMBIO CLIMÁTICO
(19/11/2015)

En concordancia con las decisiones 1 CP 19 y 1 CP 20, de la Conferencia de las Partes de la Convención Marco de Naciones Unidas sobre Cambio Climático (CMNUCC), la República de Cuba se complace en presentar su “Contribución Nacionalmente Determinada” (INDC, por sus siglas en inglés).

1. Acciones de Cuba para un desarrollo sostenible.

La estrategia de desarrollo económico y social de la República de Cuba, se caracteriza por darle prioridad a las aspiraciones y necesidades del ser humano y tiene como objetivo principal la constante elevación del nivel y la calidad de vida de la población. El país, al propio tiempo busca crecer económicamente, preservando el medio ambiente y en un marco de equidad social. La protección del medio ambiente y el uso sostenible de sus recursos naturales han constituido siempre una prioridad para el Estado cubano.

Para ello hemos debido enfrentar grandes retos. Al Triunfo de la Revolución, el primero de enero de 1959, había un millón de analfabetos, no contábamos con ningún centro de investigación científica y existían solo cuatro estaciones experimentales con menos de cien personas empleadas. No se disponía de programas de investigación-desarrollo financiados por el gobierno o por las empresas, ya fuesen nacionales o extranjeras. La nación tenía tres universidades.

Tan temprano como el 15 de enero de 1960, el entonces primer ministro cubano Fidel Castro Ruz afirmó: “El futuro de nuestra patria tienen que ser necesariamente un futuro de hombres de ciencia, tiene

que ser un futuro de hombres de pensamiento, porque precisamente es lo que más estamos sembrando; lo que más estamos sembrando son oportunidades a la inteligencia”. En tan solo un año, el país desarrolló una masiva campaña para enseñar al pueblo a leer y a escribir, que dio inició al desarrollo impetuoso de la educación cubana.

En paralelo se inició la reforma universitaria, los hospitales se convirtieron en instituciones docentes y de investigación y se crearon los primeros institutos bajo la dirección del Ministerio de Industrias y de la naciente Academia de Ciencias de Cuba.

Durante las primeras tres décadas de Revolución, se impulsó la formación de la infraestructura y el capital humano especializado en las esferas medioambientales, lo que permitió ir conociendo el inventario y estado de los recursos naturales del país. Se crearon o perfeccionaron redes temáticas que fueron engrosando las bases de datos de servicios científico-tecnológicos; tales como el meteorológico, hidrológico, sismológico, geodésico, oceanográfico, radiológico, y sanitarios, por solo citar algunos.

En 1976, y por Acuerdo del Consejo de Ministros, se crea la Comisión Nacional de Protección del Medio Ambiente y Conservación de los Recursos Naturales (COMARNA), integrada por los órganos, organismos e instituciones más directamente vinculadas con la protección del medio ambiente y el uso racional de los recursos naturales.

El 10 de enero de 1981, la Asamblea Nacional del Poder Popular aprobó la Ley No. 33, de Protección del Medio Ambiente y el Uso Racional de los Recursos Naturales, que estableció los principios básicos en este campo y creó el Sistema Nacional de Protección del Medio Ambiente y del uso Racional de los Recursos Naturales.

El discurso del entonces Presidente, Fidel Castro Ruz, en Río de Janeiro (1992), en ocasión de la Cumbre de la Tierra, marcó un hito en

el pensamiento medioambiental, al denunciar las causas más profundas del problema: la necesidad de una mejor distribución de las riquezas y de la aplicación de la tecnología para el desarrollo humano y no para el lujo y el despilfarro que promueven las sociedades consumistas.

Apenas concluida la Cumbre de Río en el año 1992 y tomando como base los compromisos contraídos por el país, Cuba modificó el Artículo 27 de la Constitución de la República, en el que se incorpora el concepto de desarrollo sostenible. En ese mismo año se firman la Convención sobre la Diversidad Biológica y la Convención Marco de las Naciones Unidas sobre Cambio Climático.

En 1994, se crea el Ministerio de Ciencia, Tecnología y Medio Ambiente (CITMA), Organismo de la Administración Central del Estado que se encarga de proponer la política ambiental y dirigir su ejecución sobre la base de la coordinación y control de la gestión ambiental del país. Posteriormente, en 1997, la Asamblea Nacional del Poder Popular aprobó la Ley 81 del medio ambiente, que ha servido de base a importantes legislaciones complementarias, normas y otros instrumentos de la gestión ambiental, lo que incluye los elementos regulatorios y de supervisión estatal.

Entre las herramientas principales con que ha contado el país para la implementación de su política ambiental, han estado la Estrategia Ambiental Nacional, las Sectoriales y las Territoriales. Estas herramientas han devenido en instrumentos eficaces, dirigidos a ejecutar acciones a favor de mejorar el desempeño ambiental. En su concepción y aplicación, estas estrategias interrelacionan los aspectos económicos, sociales y ambientales, lo que las convierte en estrategias para el desarrollo sostenible.

Cuba alcanzó las metas trazadas por los Objetivos de Desarrollo del Milenio, gracias a la voluntad del gobierno que estableció desde el triunfo mismo de la revolución en enero de 1959 una política social

inclusiva y humanitaria. El esfuerzo y el interés de las autoridades han posibilitado que hoy todos los cubanos, sin excepción, tengan acceso a derechos humanos fundamentales como la educación, la salud y la seguridad alimentaria, entre otros.

La Organización de Naciones Unidas para la Agricultura y la Alimentación ha destacado nuestros avances en la lucha contra el hambre y la desnutrición. Cuba se ha convertido en un referente de la seguridad alimentaria en América Latina y el Caribe, ya que se trata de uno de los ocho países de la región que han logrado erradicar completamente el hambre.

Los esfuerzos de Cuba, en pos del desarrollo sostenible, cuentan también con otros reconocimientos internacionales. En 2006 Cuba fue referida por el Informe “Planeta Vivo”, (informe bianual de la Fundación Mundial de la Naturaleza (WWF por sus siglas en inglés), como el único país en el mundo con condiciones para llevar adelante las metas del desarrollo sostenible. En 2015 la Red de la Huella Ecológica Global (Global Footprint Network), identifica a Cuba entre los ocho países que cumplen las dos condiciones esenciales para alcanzar el desarrollo sostenible, en el contexto de los Objetivos de Desarrollo Sostenible adoptados por Naciones Unidas, al combinar un bienestar alto, con una Huella Ecológica inferior a 1.7 hectáreas.

Para alcanzar estos resultados, el país debió superar ingentes obstáculos, en primer lugar el bloqueo económico, comercial y financiero impuesto por los Estados Unidos contra Cuba desde hace 55 años, que permanece intacto a pesar del reciente restablecimiento de las relaciones diplomáticas entre ambos países y de algunas limitadas medidas tomadas por el Presidente estadounidense, que inciden sobre su aplicación. El bloqueo le ha impuesto a Cuba serias dificultades para acceder a los recursos, tecnologías, equipamientos y conocimientos científicos y técnicos requeridos, para su desarrollo sostenible.

2. Circunstancias nacionales

Para Cuba el enfrentamiento al cambio climático es una alta prioridad. El archipiélago cubano es muy vulnerable al cambio climático global, dado su condición de pequeño estado insular situado en la región tropical del planeta. El cambio climático viene agravando y agravará en el futuro, los problemas ambientales¹ acumulados en la nación, convirtiéndose paulatinamente en un factor determinante del desarrollo sostenible.

El clima en Cuba es hoy más cálido y extremo. Desde mediados del siglo pasado la temperatura promedio anual ha aumentado en 0.9 grados Celsius. La última década del pasado siglo y la primera del presente, han sido las más cálidas, de acuerdo a las mediciones históricas de la temperatura. Se ha registrado el ascenso del nivel del mar, en los últimos cuarenta años, según mediciones en varios puntos del archipiélago cubano. La estimación de la velocidad promedio de la elevación del nivel medio del mar relativo ha sido determinada en 1,43 mm/año. El ritmo de retroceso de la línea de costas de playas arenosas, ha sido determinado en 1,2 metros promedio por año.

Se ha observado una gran variabilidad en la actividad ciclónica y en la actualidad estamos en una etapa muy activa. Desde el 2001 y hasta la fecha han afectado a Cuba 8 huracanes intensos, hecho sin precedentes en la historia.

El régimen de lluvias está variando. En las últimas décadas las lluvias en el período seco han aumentado. La frecuencia y extensión de las sequías se ha incrementado significativamente desde 1960; con daños mayores en la región oriental.

¹ La Estrategia Ambiental Nacional vigente reconoce como problemas ambientales: Degradación de los suelos, afectaciones a la cobertura forestal, la contaminación, la pérdida de la diversidad biológica y la carencia del agua.

Se han observado cambios en la disponibilidad de agua y se estima una disminución del potencial hídrico. Otras afectaciones se han estado observando o midiendo, en los sectores de la agricultura y la salud humana, así como en la biodiversidad.

En el caso del nivel medio del mar, las proyecciones futuras indican ascensos que implicarían una disminución lenta de la superficie emergida del país y la salinización paulatina de los acuíferos subterráneos, por el avance de la llamada “cuña salina”. Por su parte la sobreelevación del nivel del mar debido a los huracanes intensos y otros eventos meteorológicos extremos, continuará representando el principal peligro del cambio climático para el archipiélago cubano por las inundaciones costeras y la destrucción del patrimonio natural y humano cercano a la costa.

Los estudios indican que quedaría sumergida de forma permanente, el 2,45 % de la superficie terrestre para el 2050, con una elevación del nivel del mar de 27cm y de 5,80 % para el 2100 con una elevación del nivel medio del mar 85 cm, sin considerar los cayos. Respecto a los asentamientos humanos, se estiman afectaciones parciales para 78 asentamientos en 2050 y 107 para el 2100, mientras la cifra de afectaciones totales es de 15 y 6, respectivamente.

Lo anterior implicará afectaciones sensibles, si no se toman medidas de adaptación.

Los impactos que ya hoy se hacen sentir, asociados a la variabilidad climática y la vulnerabilidad del país, implican una carga económica de grandes dimensiones para Cuba. Las pérdidas por 16 huracanes desde 1998 al 2008 se cifraron en 20 mil 564 millones de dólares², sin incluir las cuantiosas afectaciones ocasionadas por la sequía.

² Fuente: Lineamientos de la Política Económica y Social del Partido y la Revolución (2011).

En ese contexto, el Gobierno cubano reconoce como prioridad de su política la adaptación al cambio climático y ha incentivado la creación de capacidades dirigidas al conocimiento y enfrentamiento de los impactos del cambio climático para el presente siglo.

El potencial científico-tecnológico desarrollado en las esferas del medio ambiente ha llevado a cabo, desde 1991, los estudios que han evidenciado cambios del clima en Cuba; sus impactos y vulnerabilidades; así como importantes proyectos relacionados con el cambio climático y su evaluación a niveles global, nacional y local.

En octubre del año 2007, el Consejo de Ministros analizó por primera vez el tema del cambio climático y aprobó un programa compuesto por seis tareas generales, que priorizó la adaptación en los sectores económicos y sociales, enfocada hacia la zona costera y vinculada con la reducción de desastres.

En el 2007 se realiza el primer mapa de alerta sobre el peligro y las vulnerabilidades del ascenso del nivel medio del mar para Cuba, el cual derivó en un conjunto de investigaciones, que se integran lo que se conoce como el Macroproyecto “Peligros y Vulnerabilidad Costera para los años 2050-2100”, bajo el cual se ha compilado, procesado y producido un amplio volumen de información, y una diversidad de mapas e informes sobre el estado y las perspectivas del archipiélago cubano, frente a los impactos del cambio climático, con especial atención al ascenso del nivel medio del mar, y los eventos hidrometeorológicos extremos.

En estas investigaciones, se actualizan las predicciones futuras del ascenso del nivel medio del mar a consecuencia del cambio climático, los peligros y vulnerabilidades, y las posibles medidas generales de adaptación para la zona costera cubana.

Los Estudios de Peligro, Vulnerabilidad y Riesgo (PVR), iniciados en 2006, contemplan los peligros de origen natural tanto climáticos y

otros como incendios rurales, deslizamientos y sismos; así como los peligros tecnológicos y los sanitarios. En el 2011 se culminó la primera fase de la ejecución de estos estudios (inundaciones por intensas lluvias, inundaciones por penetraciones costeras y afectaciones por fuertes vientos).

La aplicabilidad de estos estudios es diversa e incluye su utilización en los planes de reducción de desastres, en los análisis de inversiones, proyectos y programas económicos y sociales, en las evaluaciones de apreciación de peligros, como información de consulta para la toma de decisiones a nivel de gobierno y sectores, en la aplicación en los planes de ordenamiento territorial, como información base para la educación, y la divulgación ambiental y en el desarrollo de estudios e investigaciones.

Como resultado de la presentación del Macroproyecto: “Peligros y Vulnerabilidad Costera (2050-2100)” al Consejo de Ministros, en febrero del 2011, fueron aprobadas seis Directivas y un Plan de Acción, producto de las conclusiones y recomendaciones científico-tecnológicas disponibles hasta ese momento.

Los “Lineamientos de la Política Económica y Social del Partido y la Revolución” aprobados el 18 de abril de 2011, plantean la actualización del modelo económico y social para consolidar una sociedad socialista próspera y sostenible.

Respecto a la mitigación, la contribución de Cuba a las emisiones globales de gases de efecto invernadero es mínimo, y no rebasa el 0,08 %³. Pese al bajo impacto de las emisiones y la prioridad y el costo que para el país significa la adaptación, Cuba ha desarrollado y financiado sistemáticamente acciones de mitigación asociadas al ahorro, el empleo de energías renovables, la eficiencia energética y la

³ Correspondiente al Inventario GEI para el año 2010

reforestación, las que en algunos casos han tenido un papel destacado, respecto a las tendencias internacionales.

A partir de 1990, se observa una brusca reducción en las emisiones del país, como una consecuencia de la aguda crisis económica resultante del efecto combinado de la desaparición de los principales vínculos y condiciones comerciales que durante varios años sostuvo Cuba con los países de Europa del Este y la agudización del bloqueo por parte de los Estados Unidos.

Si bien la disminución en términos del Producto Interno Bruto alcanzó 35% en estos años, la producción en general decayó en más del 45%, afectando de forma generalizada las actividades económicas y sociales y en especial, renglones económicos fundamentales como la agroindustria azucarera. También fueron afectados sectores de gran peso en las emisiones de GEI, como la generación de electricidad, la industria siderúrgica, la extracción y procesamiento de níquel, así como la industria de materiales de construcción, el transporte y otras actividades agropecuarias

3. Visión de País sobre las contribuciones nacionalmente determinadas y respecto a las prioridades en el proceso negociador.

Cuba percibe las contribuciones nacionalmente determinadas como un proceso en curso, que se inicia con la Convención en 1992, y continua hoy bajo los principios y mandatos de la Convención, en particular las obligaciones diferenciadas que estipula el Artículo 4 de este instrumento legal.

Dado que el Acuerdo de París está en negociación, las contribuciones que más adelante se declaran por parte de Cuba, son un aporte al debate previo que hoy está ocurriendo. En consecuencia, una vez concluya la negociación en París y en dependencia de los resultados que allí se alcancen, en particular respecto a los medios de

implementación, Cuba reconsiderará la información a someter a la Convención.

Para alcanzar los resultados esperados en las negociaciones climáticas y en la implementación de las contribuciones nacionales, es esencial considerar los siguientes elementos:

- las finanzas climáticas y la transferencia de tecnologías son un aspecto crucial de las negociaciones con vista a la adopción de un acuerdo global vinculante y aplicable a todos en París. El acceso a recursos financieros nuevos y adicionales, y a tecnologías ambientalmente idóneas ha sido un reclamo histórico de los países en desarrollo para avanzar por la senda del desarrollo sostenible.
- Este reclamo ha quedado refrendado en las distintas cumbres sobre medio ambiente y desarrollo y temas afines, desde la Cumbre de la Tierra, en Río de Janeiro (1992), como un aspecto básico de la aplicación de los principios de responsabilidades comunes pero diferenciadas, y la equidad.
- En el contexto de las negociaciones sobre cambio climático, estos temas se han mantenido en el primer plano de las discusiones y en los acuerdos logrados desde la adopción de la Convención y el Protocolo de Kioto. Sin embargo, su avance en la práctica ha sido limitado.
- Sin la determinación de un compromiso claro y prospectivo en cuanto al comportamiento de las finanzas climáticas y para el apoyo tecnológico, no será posible una mayor contribución de los países en desarrollo ni un acuerdo global perdurable.
- Si bien se ha avanzado en la conceptualización acerca de estos temas, aún persisten importantes brechas por cubrir, y la materialización de los requerimientos de transferencia de

recursos financieros y tecnologías desde los países desarrollados a los países en desarrollo queda en niveles muy por debajo de las necesidades y del compromiso internacional de la comunidad de donantes.

- En este sentido, los montos comprometidos (incluidos los recursos anunciados para el Fondo Verde Climático) son extremadamente limitados con relación a las necesidades de adaptación y mitigación identificadas en los países en desarrollo, y muchas veces más que recursos frescos se trata de fondos “reciclados” o sustraídos de los flujos de Ayuda Oficial para el Desarrollo que, por demás, distan de los compromisos de los países desarrollados en esta materia.
- Un área de particular interés para los países en desarrollo, sobre todo los menos adelantados y los pequeños Estados insulares, es el acceso a financiamiento y tecnologías en condiciones preferenciales para enfrentar los enormes retos de la adaptación al cambio climático, así como la cobertura de las pérdidas y daños. Estos temas, dada su alta prioridad, deben ser debidamente atendidos como parte de la concreción de los medios de implementación, y los compromisos de los países desarrollados en esta materia.
- La definición de una hoja de ruta transparente para el apoyo financiero de los países desarrollados a las acciones de respuesta al cambio climático de los países en desarrollo, sigue siendo un tema pendiente. Esta hoja de ruta indicaría metas a cumplir desde el presente hasta al objetivo de 100 mil millones de dólares comprometidos como base por los países desarrollados para 2020, y más allá.
- Si bien todas las fuentes, incluidos fondos públicos y flujos privados, bilaterales y multilaterales, entre otros, pueden contribuir con aportes al necesario financiamiento que requieren

los países en desarrollo, debe darse prioridad al financiamiento público. No se puede sobredimensionar el papel de los flujos privados de financiamiento e inversión, dada la inestabilidad y volatilidad de tales flujos, como la que ha predominado desde el año 2008. Lo sucedido en los mercados globales de carbono durante este período de contracción y desaceleración económica revela lo antes expuesto.

- Con relación al acceso a tecnologías idóneas por parte de los países en desarrollo -incluidas aquellas con baja intensidad de carbono- se requerirá de parte de los países desarrollados, entre otras cosas, remover barreras comerciales que afectan estos flujos, como aquellas asociadas a normas más estrictas y uniformes de protección de la propiedad intelectual. También debe priorizarse el apoyo a las inversiones básicas en I+D en países en desarrollo, como precondition para avanzar en las trayectorias resilientes de desarrollo sostenible.

Sobre la base de los principios y conceptos antes enunciados, y en el contexto de su proyecto socialista y el desarrollo económico y social sostenible, Cuba continuará contribuyendo a los esfuerzos por fortalecer la implementación de la Convención, tanto en adaptación como en mitigación.

4. Elementos específicos de la Contribución Nacional de Cuba.

ADAPTACIÓN

Los elementos sobre adaptación incluidos en esta contribución, se presentan para indicar las prioridades de Cuba, de acuerdo con sus circunstancias, y no indican en modo alguno una obligación internacional del país, en el contexto de las negociaciones climáticas.

Acciones principales	<p>La adaptación constituye una prioridad para Cuba.</p> <p>En correspondencia con los estudios y evaluaciones realizados hasta el momento, las acciones principales de adaptación que pueden constituir contribuciones del país son:</p> <ol style="list-style-type: none">1. Disminuir la vulnerabilidad costera para los asentamientos amenazados por el aumento del nivel del mar y la sobreelevación de este por los huracanes y el oleaje.2. Recuperar las áreas de manglares más afectadas del archipiélago cubano y detener en lo posible el deterioro de las crestas de arrecifes de coral.3. Incorporar la dimensión de la adaptación a los programas, planes y proyectos vinculados a la producción de alimentos, el manejo integral del agua, ordenamiento del territorio, forestal, pesca, el turismo y la salud.4. Conformar una red de monitoreo ambiental, que permita la evaluación sistemática de las tendencias climáticas y medioambientales para la toma de decisiones.5. Reducir la vulnerabilidad en el sector de la salud, a partir de un mejor conocimiento y entendimiento de las relaciones entre la variabilidad del clima, el cambio climático y la salud humana, en dos ejes esenciales: las enfermedades infecciosas y el Sistema de Vigilancia y Alerta Temprana del sector.6. Sostener y desarrollar investigaciones
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	<p>integrales para proteger, conservar y rehabilitar el medio ambiente y adecuar la política ambiental a las nuevas proyecciones del entorno económico y social. Priorizar estudios encaminados al enfrentamiento al cambio climático y, en general, a la sostenibilidad del desarrollo del país. Enfatizar la conservación y uso racional de recursos naturales como los suelos, el agua, las playas, la atmósfera, los bosques y la biodiversidad, así como el fomento de la educación ambiental⁴.</p>
<p>Financiación de las acciones de adaptación</p>	<p>Cuba identifica expresamente, en el Plan Anual de la Economía, recursos destinados a la adaptación. Estas cifras hacia futuro tendrán el nivel que permitan las posibilidades financieras del país. Para responder a los crecientes impactos del cambio climático se requerirán montos muy superiores.</p> <p>Estas y otras áreas asociadas al desarrollo económico y social del país, demandarán de recursos financieros, tecnología y creación de capacidades, provenientes de la cooperación internacional, y del cumplimiento de las obligaciones de los países industrializados bajo la Convención Marco de las Naciones Unidas sobre el cambio climático.</p>
MITIGACIÓN	
<p>Compromiso sostenido de Cuba, con los objetivos de</p>	<p>Cuba ha realizado un esfuerzo importante en la conducción de programas que conllevan a la reducción de las emisiones de gases de efecto invernadero.</p>

⁴ Corresponde al Lineamiento 133 de los Lineamientos de la Política Económica y Social del Partido y la Revolución.

<p>mitigación de la Convención</p>	<p>Fue uno de los primeros países en el mundo en iniciar el reemplazo de las bombillas incandescentes (2005), y ha mantenido desde 1959 un incremento sostenido de su cubierta boscosa.</p> <p>En 1997 se crea el Programa de Ahorro de Electricidad en Cuba (PAEC) y desde 2006 se implementan los Programas de la Revolución Energética en Cuba que incluyeron:</p> <ul style="list-style-type: none"> • El cambio de: 9,4 millones de bombillos incandescentes por bombillos ahorradores; 2,6 millones de refrigeradores; un millón de ventiladores; 260 mil motobombas; 247 mil televisores; 230 mil aires acondicionados; instalación de 2400 MW de generación distribuida con motores de alta eficiencia (fuel y diesel). • La rehabilitación de las redes de distribución eléctricas. • El fortalecimiento del ahorro y uso eficiente de la energía en el sector estatal, principalmente en los altos consumidores. • Campañas de divulgación para la promoción de las políticas de ahorro en la población y con los niños en las escuelas sobre el uso eficiente de la energía. <p>En el 2012 se crea la Oficina Nacional para el Control del Uso Racional de la Energía (ONURE) y se fortalece la inspección estatal al uso eficiente de los portadores energéticos.</p> <p>El desarrollo de las energías renovables ha sido una prioridad para el país durante décadas.</p>
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<p>Perfil de las emisiones actuales</p>	<p>De acuerdo al último inventario de GEI, con cierre estadístico 2010, las emisiones brutas ascendían aproximadamente a 40 millones de toneladas de CO₂ eq, lo que equivale al 84 % de las emisiones con respecto al año base 1990. Del total de GEI emitidos en el año 2010, aproximadamente el 76 % correspondió al sector de energía, el cual abarca todas las emisiones por concepto de quema de combustibles (generación energía, transporte, industrias). Le sigue en importancia el sector agricultura con el 15 % del total de emisiones, y el resto es repartido entre desechos e industria (9 %).</p> <p>Los bosques influyen grandemente dentro de las emisiones netas de inventario de GEI en Cuba, al remover aproximadamente 14,3 millones de toneladas de CO₂ de acuerdo a los datos del último inventario. Ello es fruto del crecimiento sostenido de la cubierta boscosa en Cuba, desde un 13,9% del territorio, al triunfo de la Revolución, hasta 29.4% en 2014.</p>
<p>Consideraciones generales sobre las contribuciones de mitigación de Cuba</p>	<p>Cuba continuará mostrando su compromiso con la reducción de emisiones de gases de efecto invernadero, en correspondencia con sus circunstancias nacionales y con los recursos financieros y tecnológicos de que disponga, dirigidos a la modernización y el desarrollo tecnológico sobre bases de sostenibilidad, así como el fortalecimiento de sus capacidades.</p> <p>El monto de su contribución dependerá del cumplimiento de las obligaciones internacionales establecidas bajo la Convención</p>

	<p>Para toda acción que se considere, se valorarán los posibles cobeneficios en adaptación.</p>
<p>Contribución (es) propuesta (s)</p>	<p>Teniendo como base el potencial de fuentes renovables disponible en el país, se prevé la instalación de 2 144 MW de potencia conectada a la red eléctrica nacional, que incluye la construcción de:</p> <ul style="list-style-type: none"> • 19 bioeléctricas anexas a los centrales azucareros con 755 MW a partir de la biomasa cañera y forestal. • 13 parques eólicos con 633 MW. • 700 MW Fotovoltaicos y, • 74 pequeñas centrales hidroeléctricas <p>Se estima que la realización de estos programas permitirá la generación de más de 7 mil GWh al año con fuentes renovables, dejando de emitir a la atmósfera más de 6 millones de toneladas de CO₂.</p> <p>La ejecución de estos programas demanda un monto financiero no menor de 4 mil millones de dólares.</p> <p>En adición, se trabaja en otros proyectos que incluyen:</p> <ul style="list-style-type: none"> • La instalación de 200 mil m² de calentadores solares en los sectores residencial e industrial. • La instalación de bombas solares en la agricultura.

	<ul style="list-style-type: none"> • El aprovechamiento de los residuos orgánicos para la producción de biogás y la obtención de bioabonos que remplazan fertilizantes químicos coadyuvará a la reducción de las emisiones y a la disminución de la contaminación de cuencas hidrográficas y bahías. Especial atención tienen los residuos de la producción animal, la industria y los sólidos urbanos. <p>Por otra parte, para incrementar la eficiencia en el uso de la energía, la nueva política energética prevé, entre otras acciones, las siguientes:</p> <ul style="list-style-type: none"> • La instalación de tecnología LED con la distribución de 13 millones de lámparas en el sector residencial y de 250 mil luminarias para el alumbrado público. • La sustitución de 2 millones de cocinas eléctricas de resistencia por cocinas de inducción. <p>El desarrollo y encadenamiento de la industria nacional con estos programas, es un objetivo esencial de la política para la asimilación, desarrollo y producción de equipos y medios para el aprovechamiento de las fuentes renovables y la elevación de la eficiencia energética.</p>
Tipo de contribución	Las contribuciones que asumiría el país en las circunstancias actuales son del tipo de políticas y proyectos.
Año meta	El horizonte de tiempo de la contribución nacional es el año 2030. En función del resultado de las negociaciones del Acuerdo de Paris, en la sección sobre periodos, Cuba estudiará la posibilidad de

	comunicar metas indicativas en otros períodos intermedios.
Sectores priorizados (Ámbito)	Teniendo en cuenta el aporte sectorial al inventario nacional de GEI, los sectores priorizados para la reducción de emisiones, que pueden constituir en la etapa actual contribuciones, son el sector de energía y la agricultura.
Gases previstos (Cobertura)	Entre los GEI reconocidos por el protocolo de Kioto, las acciones de reducción de emisiones previstas se refieren principalmente a tres gases: CO ₂ , CH ₄ , N ₂ O.
Requerimientos en medios de implementación para la(s) contribución(es)	<p>La realización de las acciones identificadas para la adaptación y la mitigación, demandan el apoyo de la cooperación internacional y de los mecanismos de financiación para cambio climático.</p> <p>Se requiere también incrementar el acceso al Mecanismo de Tecnología (Comité Ejecutivo de Tecnología y Centro y Red de Tecnología del Clima) de la Convención, para facilitar el desarrollo y transferencia de tecnología, mediante el apoyo al despliegue de tecnologías de mitigación y adaptación.</p>

CONTRIBUCIÓN DE CUBA ANTE LA COOPERACIÓN INTERNACIONAL.

A partir de la experiencia acumulada, nuestro país ha compartido sus resultados con otras naciones en vías de desarrollo, en especial los pequeños estados insulares. Las vías han sido diversas, desde la colaboración bilateral hasta acciones con el apoyo de países desarrollados y organizaciones internacionales.

Con asistencia internacional, Cuba cuenta hoy con Centro de Creación de Capacidades para Reducción de Riesgos de Desastres y la Adaptación al Cambio Climático, que ha realizado múltiples actividades y alberga aún mayores potencialidades, para continuar impulsando la cooperación Sur - Sur.

Cuba considera que estas son acciones nacionales que contribuyen a la implementación efectiva de la Convención, y reafirma su voluntad para seguir cooperando en el desarrollo de capacidades en el enfrentamiento al cambio climático, incluyendo:

- Asistencia técnica en la preparación de las comunicaciones nacionales y los inventarios de gases de efecto invernadero.
- Desarrollo de la modelación y las proyecciones climáticas.
- Realización e implementación de Estudios de Peligro, Vulnerabilidad y Riesgo.
- Evaluaciones sobre vulnerabilidad costera e impactos de eventos extremos y del cambio climático, como parte de la evaluación de impacto ambiental de obras y proyectos de desarrollo.

DERECHO SOBERANO A MODIFICAR LA CONTRIBUCIÓN DE ACUERDO A LAS CIRCUNSTANCIAS NACIONALES

Cuba se reserva el derecho a ajustar sus contribuciones:

- En caso de afectaciones graves por un fenómeno natural extremo u otro caso de fuerza mayor.
- Cuando no se disponga de un apoyo adecuado en forma de financiación, transferencia de tecnología y fomento de la capacidad, de conformidad con los compromisos establecidos para los países industrializados en la Convención.

REPUBLIQUE DEMOCRATIQUE DU CONGO

SOUSSION DE LA CONTRIBUTION NATIONALE PREVUE DETERMINEE AU NIVEAU NATIONAL AU TITRE DE LA CONVENTION DES NATIONS UNIES SUR LES CHANGEMENTS CLIMATIQUES.

Résumé

Année de référence : 2000.

Période d'engagement : 2021 – 2030.

Type de contribution : Conditionnel.

Secteurs pris en compte : Agriculture, Forêts et Energie.

Gaz concernés : CO₂, CH₄, N₂O.

Niveau de réduction : 17%.

Les besoins en financement de la CPDN de la République Démocratique du Congo : 21,622 milliards USD, dont :

- Adaptation : 9,082 milliards USD ;
- Atténuation : 12,540 milliards USD.

1. But, priorités de développement et contexte national des changements climatiques.

1.1. But et plans de développement durable

Avec ses 2.345.000 km² de superficie, la République Démocratique du Congo (RDC), se caractérise par (i) sa richesse en ressources naturelles exceptionnelles (forêts, mines, ressources hydriques, biodiversité, énergie), (ii) son dense réseau hydrographique, dont le Bassin du fleuve Congo est le plus dominant (3,7 millions de km²), et (iii) sa population estimée à environ 75 millions d'habitants, avec une croissance démographique de 3,1%, dont les revenus proviennent essentiellement du secteur informel.

La stratégie nationale de développement durable et le programme d'action du gouvernement pour la période 2012–2016 ainsi que la prospective d'émergence 2030 s'articulent autour des axes prioritaires comprenant les secteurs mines, agriculture, forêts et le développement du tissu industriel dans un cadre davantage décentralisé.

L'intégration des préoccupations environnementales, en général, du développement durable et des changements climatiques en particulier, dans toutes les stratégies sectorielles et la planification nationale de développement demeurent un enjeu clé.

1.2.Principaux défis de développement socio-économique et environnemental.

Sur le plan économique, le pays enregistre des progrès dans la croissance moyenne du PIB qui a atteint 5,6% sur la période 2006–2010, et 8,1% entre 2011 et 2013. Les investissements du secteur privé national ont peu augmenté (moins de 5% du PIB entre 1990 et 2010). Au cours de ces 10 dernières années, les dépenses publiques se sont concentrées sur le développement des infrastructures nécessaires au développement économique. En outre, le secteur agricole, qui occupe près de 70% de la population active du pays, contribue à l'économie nationale à hauteur de 50% (PNUD, 2010).

Malgré les progrès réalisés, il se fait cependant que :

- la RDC connaît une situation précaire sur le plan social qui ne semble pas s'être significativement améliorée au cours des vingt dernières années selon les chiffres issus du rapport sur les OMD¹. Elle est marquée par une pauvreté de la population, contrastant avec l'immensité des potentialités naturelles du pays, plus accentuée par une forte croissance démographique pesant sur la demande de services sociaux tant en milieu rural qu'en milieu urbain, avec une inégale répartition entre les provinces;
- le pays reste celui connaissant l'indice de développement humain le plus bas des 187 pays, selon le rapport sur le développement humain de 2014. La proportion de la population n'atteignant pas le niveau minimal d'apport calorique a augmenté au cours des années 90, passant de 31% à 73%. Ainsi donc, l'insécurité alimentaire reste forte et touche aujourd'hui 76% de la population congolaise², alors que l'alimentation représente 62,3% des dépenses totales des ménages congolais³;
- le taux d'accès de la population à l'électricité reste très faible : 15% sur le plan national (1% en milieu rural, 30% pour les villes) alors que la moyenne en Afrique subsaharienne est de 24,6% ;
- le taux d'accès à l'eau potable est de 47%, le taux d'accès au service d'assainissement est de 14% (MICS, 2010) ; l'accès des populations au service de gestion de déchets demeure insignifiant dans le milieu urbain et quasiment absent dans les zones rurales ;
- enfin, le chômage, surtout des jeunes (15–24 ans), alimenté par la forte croissance démographique, reste à un niveau très élevé, 18% au niveau national, et touche

¹ RDC, 2010. Les chiffres qui suivent sont issus de ce rapport.

² FAO, <http://www.fao.org/countries/55528/en/cod/>

³ RDC, 2011.

particulièrement les jeunes urbains (32%).

L'insuffisance des financements, tant internes qu'externes, pour la mise en œuvre effective des stratégies et de plans d'actions à grande échelle dans divers domaines ainsi que de principales réformes légales et institutionnelles constituent un défi majeur. Aussi, l'absence de véritable politique d'interventions intersectorielles dans un contexte de lutte contre les conflits de compétences entre différents secteurs (miniers, agricoles, forestiers) ne facilite pas la mise en œuvre d'actions en matière de changements climatiques dans un cadre fédérateur des programmes tant pour l'atténuation que pour l'adaptation.

Depuis quelques années, la RDC développe sa vision de développement vers l'émergence à l'horizon 2060 et ce, dans le cadre de la matérialisation de la *Révolution de la modernité* dont la planification est séquencée en trois phases, à savoir :

- entre 2012 et 2020, la RDC devra passer d'un pays à faible revenu à celui de pays à revenu intermédiaire grâce à la transformation de l'agriculture ;
- entre 2020 et 2030, la RDC passera au statut de pays émergent par une industrialisation intensive grâce au développement du secteur énergétique en appui aux secteurs des industries minière et agricole ;
- entre 2030 et 2060, la RDC devra passer du statut de pays émergent à celui de pays développé, notamment par une économie verte et une société de connaissances.

Toutefois, il est à noter que la RDC est à ce jour un pays à faible émission carbone, avec des particularités qui la distinguent des autres territoires : le capital naturel que constitue sa forêt, son potentiel hydro-électrique et ses capacités d'interconnexion avec les pays de la sous-région, son potentiel de croissance très important. Vu la trajectoire de développement national envisagé, le pays devra orienter son développement dans une perspective de développement à long terme, durable et respectueux de l'environnement.

1.3.Contexte national des changements climatiques

La RDC a ratifié la Convention-Cadre des Nations Unies sur les Changements Climatiques (CCNUCC) et le Protocole de Kyoto, respectivement en 1997 et 2005. Depuis, elle a réalisé une série d'activités dans les domaines suivants :

- l'Inventaire de ses émissions des gaz à effet de serre (GES) en 2001, 2009 et 2014 ;

- l'adoption de la loi N°011/2002 du 29 août 2002 portant Code Forestier;
- l'élaboration du Programme National Environnement, Forêts, Eaux et Biodiversité ;
- l'évaluation des risques et de la vulnérabilité aux impacts des changements climatiques en 2006 et la mise en œuvre des projets d'adaptation, particulièrement dans le secteur agricole depuis 2010 ;
- l'identification des potentialités en atténuation et les besoins technologiques en 2007 ;
- la mise en œuvre des processus de réduction des émissions dues à la déforestation et la dégradation des forêts (REDD, 2009) :
 - (i) l'engagement dans le programme d'investissement dans le secteur forestier (2010);
 - (ii) l'adoption de la Stratégie Cadre nationale sur la REDD+ (2012);
 - (iii) la création du Fonds National REDD+ en 2012;
- le lancement du processus de formulation de la politique, stratégie nationale et plan d'action en matière des changements climatiques qui comprend trois piliers, à savoir :
 - (i) la stratégie de développement sobre en carbone (2012) ;
 - (ii) le Plan National d'Adaptation de la RDC aux changements climatiques (2014);
 - (iii) l'intégration transversale dans les politiques et stratégies sectorielles;
- l'élaboration du document de politique du secteur de l'électricité, y compris l'Atlas des énergies renouvelables en RDC.

1.4. Système national de gestion des inventaires des GES.

Le Ministère de l'Environnement et Développement Durable (MEDD), à travers la Direction de Développement Durable (DDD), organe gouvernemental des négociations internationales, chargée de la coordination et du suivi de la mise en œuvre harmonieuse et cohérente de l'action du gouvernement en matière des changements climatiques, assure la gestion des inventaires des GES.

Un comité national des changements climatiques, sous la supervision du Secrétaire Général à l'Environnement et Développement Durable, dans une approche intersectorielle et interdisciplinaire, donne les principales orientations en matière de mise en œuvre des programmes et projets en matière des changements climatiques.

Sous la supervision de la DDD, des équipes d'experts, provenant des ministères et services gouvernementaux, des universités et centres de recherche nationaux, des institutions privées et des organisations non gouvernementales, sont chargées de la définition des approches méthodologiques et de l'exécution des travaux d'estimation des émissions des GES et de l'évaluation de la vulnérabilité aux effets des changements climatiques, ainsi que des besoins technologiques. La responsabilité de l'approbation formelle des rapports d'inventaires des

émissions des GES incombe spécifiquement au Comité National Climat qui le soumet au Gouvernement.

Un système national de surveillance, suivi, vérification et notification lié aux activités REDD+ a été développé au sein du MEDD. Des cellules techniques opérationnelles travaillent sur trois piliers de ce système. Il s'agit de (i) Système de Surveillance des Terres par Satellite (SSTS), (ii) Inventaire Forestier National (IFN) et (iii) Inventaire des Gaz à Effet de Serre (IGES). A ce jour, chacun de ces trois piliers réalise des progrès considérables en termes de produits et de renforcement des capacités techniques et humaines. Un système similaire de suivi des émissions hors forêts est en cours de formulation dans le cadre du processus d'élaboration de la stratégie de développement sobre en carbone et de formulation des projets NAMAs.

2. Contribution liée à l'adaptation

2.1. Justification de la prise en compte de l'adaptation dans le processus de développement de la CPDN.

L'inventaire des gaz à effet de serre réalisé en RDC (MEDD, 2015) fait apparaître les principaux secteurs émetteurs. Il s'agit principalement de l'Utilisation des Terres, Changement d'Affectation des Terres et foresterie, suivi de loin de l'agriculture, de l'énergie. Pour le reste, les émissions sont négligeables.

Le Programme national d'adaptation aux changements climatiques, PANA (MECNT, 2006) a établi une cartographie limitée de la vulnérabilité de la RDC face aux impacts des changements climatiques. Il a cependant révélé d'énormes préoccupations en matière d'agriculture, de ressources en eau et de zones côtières, qui induisent une forte vulnérabilité dans les domaines de la sécurité alimentaire et de la santé.

2.2. Résumé des tendances, impacts et vulnérabilités aux changements climatiques.

Les analyses menées ont permis de dégager les observations ci-après :

- a) les projections des variations des températures à l'horizon 2050 sont de l'ordre de 1 à 2°C et de 1,5 à 3°C à l'horizon 2100 dans le cadre du scénario d'émissions faibles B1 (Van Garderen et Ludwig, 2013) ;
- b) les résultats obtenus dans le cadre de la simulation de Pitman sur la station de Bukama pour la période 2046–2065 montrent une augmentation de l'évapotranspiration actuelle et potentielle de l'ordre de 10 à 15% ;

c) sur la base des analyses de l'historique climatique du site de Kinshasa N'Djili, il apparaît que :

- la fréquence des épisodes extrêmes humides et extrêmes sèches devient plus importante à l'horizon 2081–2100 ;
- une perturbation importante de la distribution saisonnière des pluies aux horizons 2046–2065 ;

d) sous le modèle hydrologique Pitman pour la station Bukama, il ressort que :

- une légère augmentation du stock de l'humidité du sol de 3,1%, qui serait le résultat d'une augmentation de précipitation de 10,6% ;
- une légère diminution du ruissellement total qui serait due à une diminution de la recharge et du ruissellement de surface.

e) l'analyse des résultats de simulation de Schellhuber et al. (2013), stipulent une augmentation du niveau de la mer d'environ 10% par rapport au niveau actuel le long des lignes côtières du continent Africain. Pour la RDC, cette augmentation sera de l'ordre de 60–70 cm pour les scénarios de 2°C d'élévation de température (RCP 2.6).

Les cinq principaux risques climatiques (pluies intenses, érosion côtière, inondations, crises caniculaires, et sécheresses saisonnières) à grand impact qui menacent le vécu quotidien des populations et causent notamment des pertes en vies humaines, la destruction des infrastructures, les érosions, la destruction des habitats particulièrement des pauvres en zones urbaines et accentuent la vulnérabilité due aux maladies hydriques. Les sécheresses saisonnières provoquent de graves perturbations des calendriers agricoles.

2.3. Notification de la vision, buts et cibles d'adaptation à court et long terme.

La vision de la RDC pour la mise en œuvre de l'adaptation est ancrée dans le cadre du Programme d'Action National d'Adaptation aux Changements Climatiques (PANA, 2006). Ce programme a permis d'identifier trois axes d'interventions prioritaires en matière d'adaptation :

- i. la sécurisation des moyens de subsistance et des modes de vie des communautés rurales/urbaines ;
- ii. la gestion rationnelle des ressources forestières, et
- iii. la protection et préservation des écosystèmes vulnérables des zones côtières.

Depuis 2014, un processus d'actualisation des orientations du PANA et d'intégration de la problématique d'adaptation dans les politiques et stratégies sectoriels, dans une approche

participative et pluridisciplinaire, a été initié dans le cadre du Plan National d'Adaptation aux changements climatiques (PNA).

2.4. Notification sur les initiatives et l'appui actuels et planifiés en matière d'adaptation.

Le pays a déjà déployé des efforts afin de développer des actions urgentes d'adaptation dans les secteurs de l'agriculture, du relèvement communautaire et de la lutte contre l'érosion côtière. Il s'agit de :

- PANA-ASA (2010-2013) : projet d'adaptation du secteur agricole qui s'est focalisé sur l'amélioration de la résilience de ce secteur, au niveau de 4 provinces pilotes ;
- PANA-ASA 2 « Projet pour la croissance économique résiliente et l'adaptation aux changements climatiques en RDC » qui sera mis en œuvre à partir de 2016, consiste à une dissémination des acquis de PANA-ASA dans des nouvelles zones cibles. Ce projet visera à créer un environnement habilitant pour l'adaptation et améliorer les pratiques de production agro-écologiques ;
- PANA-AFE (2015-2020): ce projet en cours capitalise les acquis de PANA-ASA en renforçant la résilience des femmes et des enfants face aux changements climatiques, dans les anciennes zones d'intervention de PANA-ASA. Il vise l'engagement de la RDC à protéger les groupes les plus vulnérables des risques climatiques ;
- PANA Zone côtière (2015-2020) : ce projet en cours vise le renforcement de la résilience des communautés face aux changements climatiques par la mise en œuvre des moyens de lutte contre l'érosion côtière, la mise en place d'un système d'alertes précoces et la diversification des activités génératrices de revenus en faveur des communautés vulnérables.

2.5. Lacunes et barrières

La RDC est confrontée à divers défis de développement au plan socio-économique, auxquels s'ajoute sa vulnérabilité aux impacts des changements climatiques. En outre, elle doit faire face à des défis majeurs à travers l'étendue de son territoire pour le développement d'un programme cohérent d'adaptation. Il s'agit notamment de:

- l'insuffisance des données climatiques fiables pour une analyse et interprétation réaliste de l'évolution climatique ;
- la faiblesse des capacités technique, institutionnelle et juridique pour soutenir le développement de l'intégration horizontale de la dimension « adaptation » aux niveaux national, régional et local ;
- l'insuffisance financière pour accompagner la mise en œuvre des initiatives d'adaptation.

2.6. Résumé des besoins

Les besoins concernent principalement le secteur d'agriculture, le secteur d'énergie et du transport avec un accès sur le renforcement de l'alimentation en eau potable, de l'assainissement et de la gestion des déchets, le renforcement des mesures de conservation de la biodiversité et d'intégration des population dans le secteur forestier et la protection intégrée des zones côtières". Les besoins totaux en investissement se lèvent à 9,082 milliards USD dont :

- secteur de l'agriculture : 1.563,90 millions USD
- secteur Energie et Transport : 7.350,00 millions USD
- secteur forestier : 50,00 millions USD
- secteur côtier et littoral (zone vulnérable Banana–Nsianfumu 26 km) : 118,000 millions USD

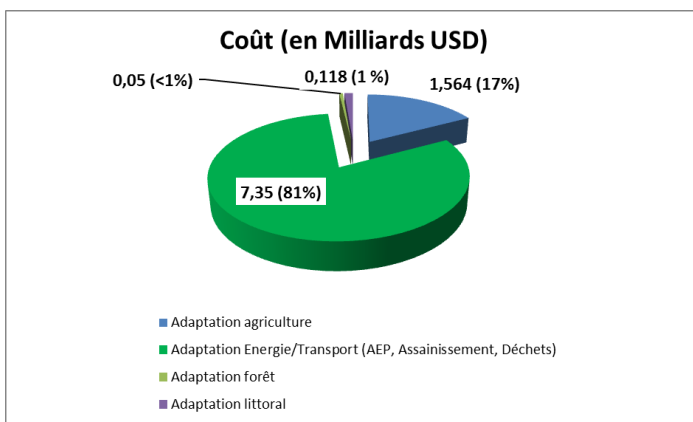


Figure 1 : Répartition du coût d'adaptation par secteur (en milliards USD).

2.7. Mécanisme du suivi et de la notification

Le pays reconnaît que le suivi-évaluation des politiques et programmes d'adaptation revêt une importance cruciale pour faire en sorte que les ressources soient ciblées sur les mesures qui donneront les meilleures chances d'accroître la résilience de sa population. Le développement d'indicateurs clés d'adaptation a déjà été exploré dans le cadre du projet PANA-ASA et sera poursuivi au cours de la mise en œuvre des projets PANA-AFE et PANA Zone côtière. Les principaux enseignements à retenir seront mis en commun avec l'ensemble des programmes. L'objectif consiste à intégrer des indicateurs d'adaptation et de vulnérabilité dans le système national de suivi, notification et vérification (MRV) qui sera développé.

3. Contribution liée à l'atténuation.

3.1. Calendrier : 2021 à 2030.

3.2. Type de contribution

La contribution de la RDC en matière d'atténuation sera basée sur des mesures, couplée à un effort minimal de réduction des émissions par rapport à la projection des émissions à l'horizon 2030 en cas du maintien du statu quo.

3.3. Niveau ciblé

Eu égard aux volumes des investissements nécessaires pour atteindre l'objectif d'atténuation visé par la RDC, au regard des priorités nationales de développement, seule une partie minimale de sa contribution pourra être financée par ses ressources propres.

Ces actions seront conditionnées par la mise à disposition d'un appui adéquat correspondant en termes de ressources financières, de transfert de technologie et de renforcement de la capacité nationale. Pour cela, il est important que l'accès aux ressources facilitant la mise en œuvre des activités reprises au sein de la CPDN de la RDC soit favorisé.

3.4. Réduction des émissions des GES

La RDC s'engage à réduire ses émissions de 17% d'ici 2030 par rapport aux émissions du scénario des émissions du statu quo (430 Mt CO₂e), soit une réduction d'un peu plus de 70 Mt CO₂e évités (Ministère de l'Environnement, 2009).

En effet, le contexte national se présente comme suit : (i) superficie forestière de la RDC de l'ordre de 152 millions d'ha en 2010 (MEDD, 2015), (ii) taux de déforestation observée entre 1990 et 2010 de l'ordre de 0,32% (MEDD, 2015) ; (iii) déforestation et dégradation forestière essentiellement provoquée par l'agriculture commerciale (~40%) et vivrière (~20%) et par la coupe du bois de chauffe (~20%)(⁴). Il est prévu l'appui des projets permettant de planter environ 3 millions d'hectares de forêt au plus tard en 2025 dans le cadre des programmes d'afforestation et de reforestation⁵, ce qui permettrait de séquestrer environ 3 millions des tonnes de CO₂.

(⁴) – Potentiel REDD+ de la RDC, Décembre 2009, Ministère de l'Environnement, Conservation de la Nature et Tourisme ;

⁵ Programme d'Action du Gouvernement 2012–2016

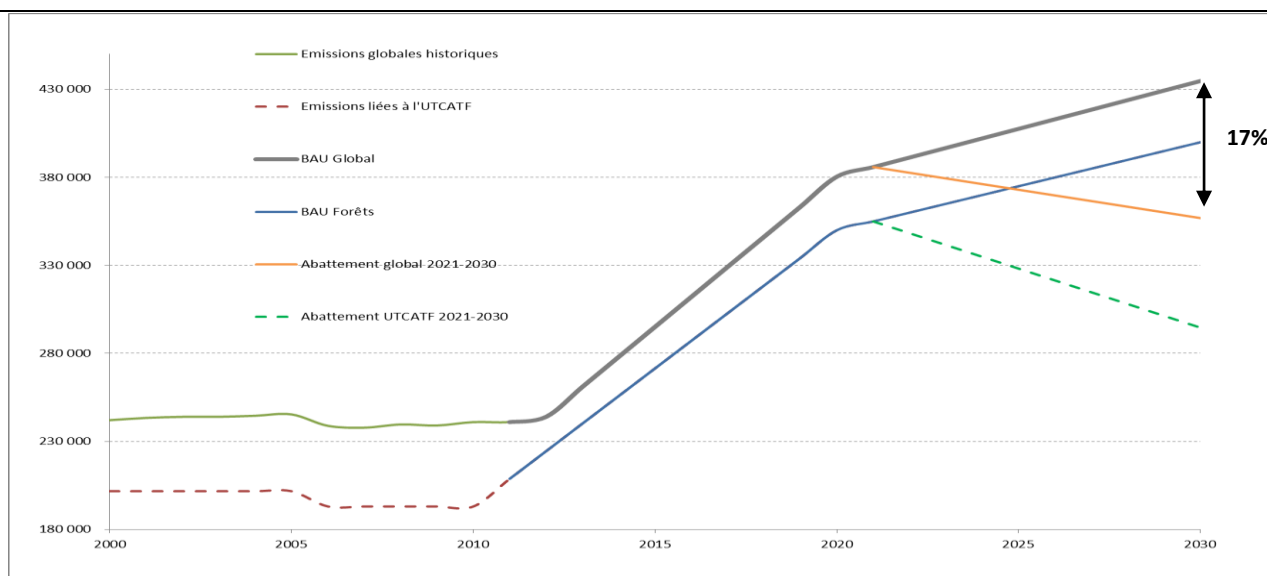


Figure 2 : Evolution des émissions des GES de 2000 à 2030.

Les principaux leviers d'interventions identifiés portent sur les secteurs Agriculture, UTCATF et Energie

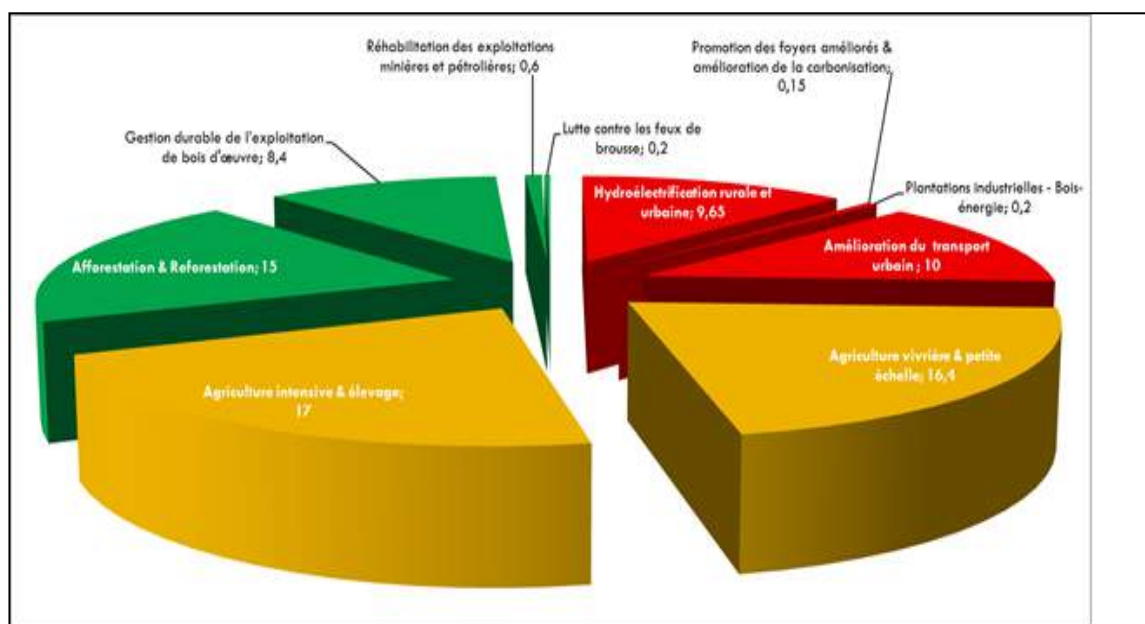


Figure 3 : Potentiel de réduction des émissions par levier en Mt CO₂e.

3.5. Moyens de mise en œuvre

Le coût total pour l'ensemble des leviers de mitigation et de séquestration de carbone dans les trois secteurs concernés est estimé à 12,54 milliards de USD.

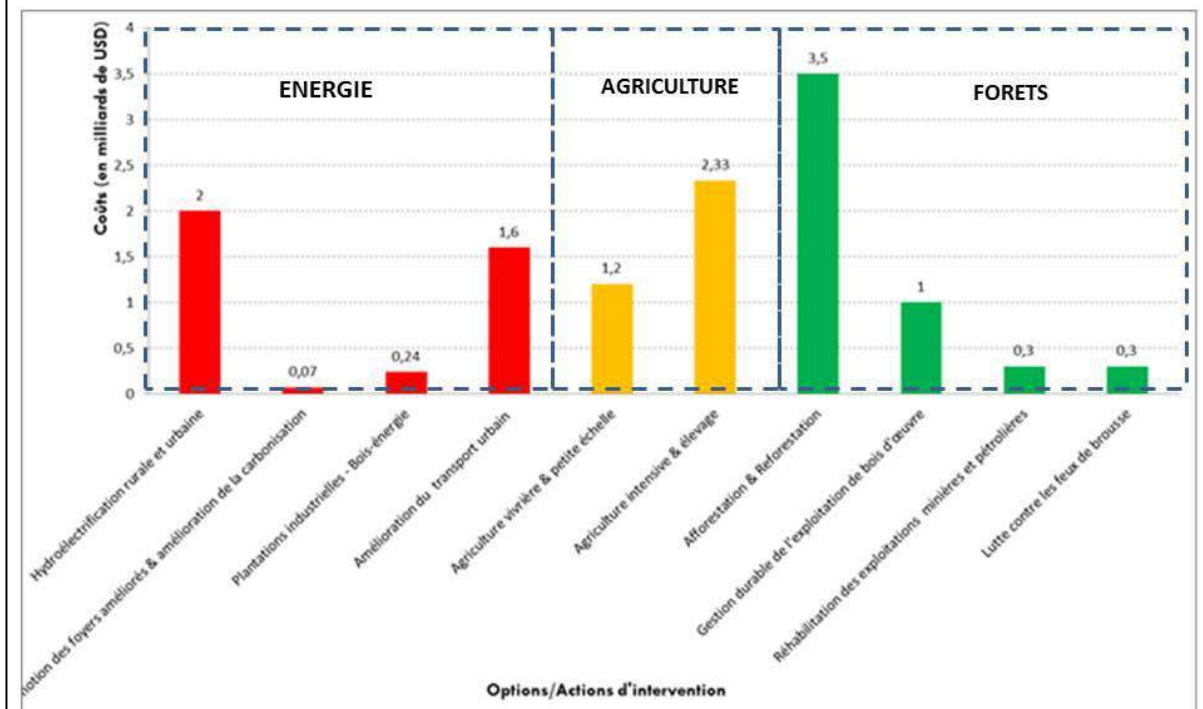


Figure 4 : Répartition du coût d'abattement des émissions par levier (en millions USD).

3.6. Secteurs et gaz concernés.

Les secteurs concernés sont l'UTCATF, l'Agriculture et l'Energie. Les GES concernés sont le CO₂, CH₄ et N₂O. Les secteurs Procédés Industriels et Déchets ne sont pas pris en compte étant donné leur contribution minimale au bilan des émissions des GES en RDC.

3.7. Méthodologie de comptage.

Conformément aux règles de comptabilisation et de notification des émissions des GES, la CPDN de la RDC s'est basée sur les Lignes directrices 1996 révisées et Lignes directrices de 2006 du GIEC, les orientations méthodologiques de la Convention en matière d'estimation des émissions des gaz à effet de serre (GES) et de notification ainsi que les méthodologies complémentaires ALU (Agriculture et autres Utilisations des Terres) et Guides de bonnes pratiques (GIEC 2000 et 2003).

3.8. Mise en œuvre des arrangements institutionnels.

Pour la mise en œuvre de son CPDN, étant donné que le Ministère de l'Environnement et Développement Durable (MEDD) a la responsabilité technique de la mise en œuvre de la politique environnementale du pays, la RDC va s'appuyer sur le mécanisme déjà en place pour la mise en œuvre de l'action du gouvernement en matière des changements climatiques, à travers la

Direction de Développement Durable (DDD).

Pour la mise en œuvre des différentes initiatives des projets, la DDD met en place une équipe multisectorielle et multidisciplinaire d'experts pour la définition et la conception des méthodologies, collecte, traitement des données, ainsi que la constitution des bases des données et l'exécution des tâches relatives aux changements climatiques. Cette équipe est mise en place comme groupe de concertation et d'information pour assurer la cohérence des méthodes proposées.

3.9. Equité et ambition

La RDC fait partie des Pays les Moins Avancés et est le pays ayant l'indice de développement humain le plus bas selon le rapport sur le développement humain de 2014. Le pays doit donc faire face à de nombreux défis en termes de développement socio-économique. Par ailleurs, le pays doit en priorité minimiser les risques d'impacts des changements climatiques, en raison de l'importante vulnérabilité de certaines activités économiques, comme l'agriculture et la foresterie.

La contribution de la RDC aux émissions globales des GES est très basse (environ 0.5% en 2010). Par ailleurs l'intensité de GES par rapport au Produit Intérieur Brut (PIB) est aussi très faible.

Le pays, de par sa très grande couverture forestière de l'ordre de 152 millions d'ha en 2010 (MEDD, 2015), est un puit net de carbone. Malgré cela, la RDC propose de mettre en œuvre des actions d'atténuation de façon à réduire ses émissions de 17%. Dans ce contexte, la République Démocratique du Congo considère que sa Contribution est ambitieuse et équitable.



Republic of Djibouti

Intended Nationally Determined Contribution of the Republic of Djibouti

August 2015

EXECUTIVE SUMMARY

The Intended Nationally Determined Contribution (INDC) of the Republic of Djibouti is an extension of the country's commitments to fighting the effects of climate change. The process of drafting the INDC enabled a summary of all of the policies and programmes linked to climate change. It also provided an opportunity to reassess financing needs to fund the country's adaptation.

As an LDC and a coastal country of the Horn of Africa, the country's vulnerability is considerably high. As a result, this contribution reflects both the country's political will to participate in the worldwide reduction of greenhouse gases (GHGs) and the scope of its adaptation needs.

The Republic of Djibouti has committed to reducing its GHG emissions by 40% by the year 2030, representing close to 2 Mt of CO₂e, compared to projections for that year according to the business-as-usual scenario. This commitment is an ambitious one for a country like the Republic of Djibouti. It can be attained through a combination of mitigation measures and the development of sustainable economic sectors like renewable energies.

To fulfil that level of ambition, the Republic of Djibouti will need to invest more than US \$3.8 billion, in collaboration with the international community. An additional US \$1.6 billion, conditional on new funding sources like the Green Climate Fund, along with international support, would enable the country to reduce its emissions by a further 20% by 2030. The total effort, under both the unconditional and conditional scenarios, would essentially entail maintaining the country's emissions at roughly their level in 2010.

In terms of adaptation, the Republic of Djibouti has undertaken numerous plans and programmes. The priority objectives are also linked to the country's social priorities:

- Reduction of vulnerability to drought;
- Protection against rising sea levels;
- Improvement of access to water;
- Protection of biodiversity;
- Reinforcement of the resilience of rural populations.

The adaptation projects currently being implemented account for a budget of nearly €100 million. However, that sum represents just 12% of the total amount that will need to be invested in adaptation under the 2°C Scenario, and a mere 7.5% in the case of the 4°C Scenario.

These figures show that investing in adaptation measures is a crucial issue for the Republic of Djibouti. The country will not be able to raise the necessary funds on its own. With this contribution, the Republic of Djibouti wants to reaffirm its belief in the principle of common but differentiated responsibilities and to call on the international community to mobilise in response to this decisive issue for all of humanity.

NATIONAL CONTEXT

The Republic of Djibouti is located in the Horn of Africa, at the intersection of the Gulf of Aden and the Red Sea. The country has a semi-desert tropical climate characterised by recurring natural catastrophes and extended periods of drought. Its arable land, natural and mineral resources, and water resources are very low and are subject to strong pressure from climate change. With an estimated per capita gross national product (GNP) of US \$1,030 in 2014, the Republic of Djibouti is one of the poorest countries in the world, and one of the most vulnerable to climate change.

At COP19 in Warsaw, the Republic of Djibouti underscored the fact that climate change is a threat to the country’s food security and water resources, as well as to sustainable development. With its arid climate and low level of social development, the Republic of Djibouti is vulnerable to various climate-related effects, including extreme drought, extreme temperatures, rising sea levels, flash floods and the salinization of soils and water. These phenomena have already been observed in the country and are expected to increase in frequency and intensity in the future, according to the various climate scenarios.

In the case of an optimistic climate scenario, the cost of the damage is likely to exceed US \$5 billion. Implementing adaptation measures would make it possible to anticipate the effects of climate change. An investment of close to US \$1 billion would enable a reduction of the total costs of the impact by two, account taken of residual damage.

Annual Cost of Damage	2010-2060
2°C Scenario, excluding natural catastrophes	US \$5 billion
4-5°C Scenario, excluding natural catastrophes	US \$9 billion
10,000 year flood scenario	US \$65 million

Source: PAGE model and FUND model

The Republic of Djibouti has thus adopted a proactive position to handling climate change. It ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1995. Pursuant to the provisions of Article 4 of that convention, the country developed a second national communication, which it submitted to the UNFCCC in 2014. Earlier, in 2006, the country had already identified a number of priority adaptation and resilience actions as part of a National Adaptation Programme of Action encompassing activities in the agricultural, forestry, water, livestock and coastal sectors.

To combine the country’s fight against the effects of climate change with its economic development, the Republic of Djibouti is pursuing the objective of becoming a veritable economic crossroads and a showcase for sustainable development along the Red Sea. To achieve that aim, several political plans are under development, including national strategies for a green economy, for biodiversity and on climate change.

The Republic of Djibouti will work to contribute to global efforts to reduce GHG emissions. This ambition will rely on the development of renewable energies such as geothermal, wind and solar power. But the country will need to focus its efforts on adaptation above all and seek out the support of the international community. The present contribution is part of a dynamic process and may be reassessed in line with changes in the national and international contexts.

DJIBOUTI’S CONTRIBUTION TO MITIGATION

Objective and expected directions for 2030

General objectives

By means of unconditional measures, the Republic of Djibouti is committed to preventing 1.8 Mt CO₂e of future GHG emissions, thus reducing its emissions by 40% compared to the business-as-usual scenario.

The implementation of conditional measures would enable a further reduction in CO₂e emissions by 0.9 Mt, or 20% of GHG emissions compared to the business-as-usual scenario for 2030. In this way, the conditional mitigation scenario would enable the Republic of Djibouti to maintain its volume of emissions at a level equivalent to that of 2010.

Business-as-usual scenario

The linear sectoral projection was used to estimate the GHG emissions level in 2030 without the implementation of any mitigation measures. In that case, 2030 GHG emissions would more than double their level in 2010. Nearly 55% of those emissions come from the “Energy” category, making it a priority sector for the implementation of mitigation options by the Republic of Djibouti.

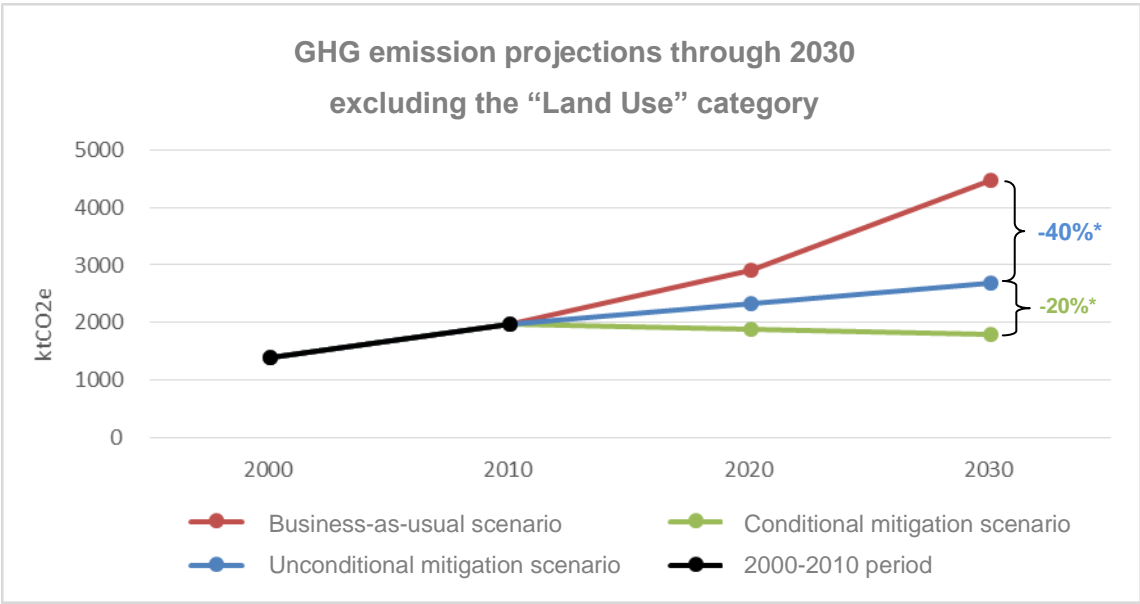


Figure 1: With no mitigation measures, the GHG emissions level will double by 2030.
 * Compared to emissions levels according to the business-as-usual scenario.

2000	2010	2020	2030
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Emissions - Business-as-usual scenario (in kt of CO ₂ e)	1400	1 974	2 905	4 475
Emissions - Unconditional mitigation scenario (in kt of CO ₂ e)			2 329 (-20%)*	2 685 (-40%)*
Emissions - Conditional mitigation scenario (in kt of CO ₂ e)			1 882 (-35%)*	1 790 (-60%)*

* Compared to emissions levels according to the business-as-usual scenario.

Assumptions and methodological approaches

Model and methodology for estimating emissions

The business-as-usual scenario was developed using the GACMO model and on linear sectoral projections. It is based on the 2000 inventory of GHG emissions, produced in accordance with the 1996 revised guidelines of the Intergovernmental Panel on Climate Change (IPCC).

Gases covered

The contribution of the Republic of Djibouti is based on estimated carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) emissions across all economic sectors. Fluoride gas emissions were not counted, because they were deemed negligible at the national level.

Geographic and sectoral scope

The selected sectors were defined on the basis of the latest GHG inventory, as per the Revised 1996 IPCC Guidelines, and cover the entire country. In view of the uncertainty in respect of the level of carbon sequestration by forest land and of emissions in uncultivated areas, the "Land Use" category was not selected.

List of selected categories and sub-categories:

- | | |
|----------------------|--|
| Energy | <ul style="list-style-type: none"> ▪ Electricity imports ▪ Consumption of fossil fuels by the industrial, residential, commercial, agricultural and transport sectors. |
| Agriculture | <ul style="list-style-type: none"> ▪ Enteric fermentation ▪ Manure management ▪ Agricultural soils |
| Waste | <ul style="list-style-type: none"> ▪ Solid waste |
| Industrial Processes | <ul style="list-style-type: none"> ▪ Cement production |

Baseline year and data

2000 was taken as the baseline year. As a result, any mitigation measures implemented after that date are not included in the business-as-usual scenarios.

The data were extracted from the latest national GHG inventory, published in 2014. Data for the “Energy” category were enhanced with more precise information collected by the *Agence Djiboutienne pour la maîtrise de l'énergie* (ADME) [Djibouti Energy Management Agency].

The GWP values used were those identified by the IPCC for the preparation of national emissions inventories in accordance with UNFCCC Decision 17/CP.8.

Strategy and planning

General strategy and evolution of the legislative and regulatory framework

The Republic of Djibouti is preparing to launch its green economy strategy, the aims of which are to encourage the use of low carbon technologies that are resilient to climate change, to promote green jobs, and to take advantage of climate finance to raise funds nationally and internationally. This strategy will be developed for the economy's key sectors, in line with the long-term vision for the country.

In parallel, the Republic of Djibouti is in the process of developing a national strategy on climate change. That strategy will draw on both the National Adaptation Plan (NAP) and the National Adaptation Programme of Action (NAPA), adopted in 2006. It will incorporate changes in regulations relating to buildings, air conditioners and refrigerators.

These two complementary strategies should enable the Republic of Djibouti to attain its 2030 targets as set out herein.

Presentation of unconditional mitigation measures

Unconditional measures are scheduled or in-progress projects, all of whose funding has been defined. The information provided in the table below shows the budget forecast and is subject to re-evaluation over the course of each project.

Table 1: Presentation of funded mitigation measures

1st electrical tie line with Ethiopia	Construction of a very high voltage line with a 50 MW capacity to import electricity from Ethiopia to Djibouti. 90% of Ethiopian electricity is generated from renewable energy sources. This project was completed in 2011.
	Funding: US \$65 million, 95% financed by the African Development Bank and 5% by the Republic of Djibouti.
	Estimated reduction in emissions: 150 kt of CO ₂ e/year.
Onshore wind farms	Installation of 60 MW onshore wind turbines in Goubet. Those power plants are scheduled to be commissioned in 2025.
	Funding: Project financed by private investors, in partnership with the Republic of Djibouti.
	Estimated reduction in emissions: 100 kt of CO ₂ e/year.
Photovoltaic plant	Installation of three solar power plants in Petit Bara, Ali Sabieh and Goubet, with

	<p>an estimated photovoltaic potential of 250 MW. Those power plants are scheduled to be commissioned in 2025.</p> <p>Funding: Project financed by private investors, in partnership with the Republic of Djibouti.</p> <p>Estimated reduction in emissions: 320 kt of CO₂e/year.</p>
Geothermal pump	<p>Exploitation of geothermal energy, whose potential is estimated at 1200 MW in the region around Lake Assal, Lake Abbé and North Goubet. The power plants are scheduled to be commissioned in 2030.</p> <p>Funding: Assal project financed by a group of donors managed by the World Bank, in the amount of US \$31 million. Other projects financed by private investors, in partnership with the Republic of Djibouti.</p> <p>Estimated reduction in emissions: 6,000 kt of CO₂e/year.</p>
New railway line	<p>Construction of a 752 km railway line between Djibouti City and Addis Ababa. It is scheduled to be put in service in October 2015.</p> <p>Funding: Project financed by private Chinese investors.</p>
Energy efficiency project on 10 buildings	<p>The primary objective of this two year project is to enable the Djibouti Energy Management Agency (ADME) to study the energy consumption of 10 buildings. The project will also be used as a capacity-building tool for other government departments concerned by the issue of energy management, thanks to a South-South partnership with other countries that have made progress in that domain.</p> <p>Funding: Project financed by the UNDP.</p>
Reduction of energy consumption by public buildings	<p>The two year project aims to improve the energy efficiency of the old Cité Ministérielle building before the installation of a photovoltaic solar park on the roof of the building. The photovoltaic system will then be connected to the national grid. To significantly reduce the State's energy bill, ADME will extend the project to all public buildings in the future.</p> <p>Funding: Project financed by the Republic of Djibouti.</p>
Global Climate Change Alliance+ project (2014-2020)	<p>For a two year period beginning in May 2015, the Global Climate Change Alliance has undertaken to:</p> <ul style="list-style-type: none"> ▪ Build Djibouti's capacity to actively participate in the fight against climate change; ▪ Develop a favourable institutional framework for mitigating climate change in the energy sector. <p>Funding: Project financed by the European Union, in the amount of US \$3 million.</p>

Presentation of conditional mitigation measures

Measures that are pending financing are being studied for the improvement of the country's energy efficiency and to reduce land-use-related emissions. The fulfilment of all of the projects identified as

priorities for the country's development (Table 2) would further reduce 2030 emissions by another 20%, in comparison to the business-as-usual scenario.

Table 2: Presentation of priority mitigation measures under study or pending funding

2nd and 3rd electrical tie lines with Ethiopia	Based on the first tie line created in 2011, construction of two more very high voltage lines with a combined capacity of 250 MW in order to import electricity from Ethiopia.
Thermal rehabilitation of buildings	Rehabilitation of 3,000 existing buildings (accommodation and service buildings) each year to improve their thermal performance by means of insulation.
Distribution of 5 million low energy light bulbs	Awareness raising on the use of energy saving lighting equipment (low energy bulbs) in residential areas.
Audit of administrative buildings	Diagnostic review of the lighting and air conditioning systems used in different administrative buildings.
Reduction of energy consumption by public buildings	Improvements to the energy efficiency of the old Cité Ministérielle building and installation of a photovoltaic solar park on the roof.
Reforestation with silvopasture practices	Reforestation of 1,000 hectares with the set-up of a silvopasture agricultural system.
Reduction of fuel wood consumption for cooking	Decrease in the consumption of wood for cooking, estimated at 56,100 tonnes each year, through the replacement of 1,000 units by systems that use LPG.
Development and maintenance of motorized two wheel vehicles	Set-up of a maintenance service for two wheel vehicles and awareness-raising about its use.

Secondary measures, likewise awaiting financing, are also under study (Table 3).

Table 3: Presentation of non-priority mitigation measures under study or pending funding

Energy production from biomass	Combined production plant for electricity using household waste. Supposed potential of 10 MW.
Tidal power plant	Energy production using tidal turbines in Goubet. Supposed potential of 5 MW.
Additional onshore wind turbines	Djibouti's total wind power potential is estimated at 390 MW. Installation of 11 onshore wind turbines in Goubet, producing 30 MW.
Accelerated replacement of air conditioners	Incentives for households to replace their air conditioners at the end of their life cycles by other, more efficient (Class A) units. An average of approximately 3,000 annually.
Accelerated replacement of refrigerators	Incentives for households to replace their refrigerators at the end of their life cycles by other, more efficient (Class A) units. An average of approximately 4,500 annually.
"Green Mosques"	Implementation of energy efficiency and effectiveness solutions in the country's mosques.

Reforestation with agroforestry	Installation of 1,000 hectares of agroforestry system.
Restriction on imports of older model cars	Elimination of the import of 10,000 old cars producing too much pollution.

Equity and ambition of the contribution of the Republic of Djibouti

On a global scale, the IPCC calculated the quantity of GHGs as more than 49,000 Mt of CO₂e in 2004. As a result, the annual emissions produced by the Republic of Djibouti, estimated at close to 2 Mt CO₂e in 2010, represent less than 0.005% of the global volume. In other words, its emissions are non-significant compared with worldwide emissions. Nonetheless, the Republic of Djibouti has prepared this contribution to reaffirm its belief in the principle of common but differentiated responsibilities and to take unprecedented measures in response to this issue.

As an LDC, it is vital for the Republic of Djibouti to reduce its emissions without significantly affecting the country's economic and social development. This contribution guarantees an equitable commitment. In the case of the unconditional scenario, the level of GHG per GDP point will decrease from 2.5 in 2000 to 0.8 in 2030. In addition, the planned mitigation measures will support priority economic sectors like renewable energies and energy efficiency. On its own scale, the Republic of Djibouti is making significant contributions to reducing global emissions.

The planned unconditional level of emissions reductions, planned under the unconditional scenario, is 40% compared to the business-as-usual scenario for 2030. This ambitious commitment will support other country's commitments so as to make a collective contribution to the global objective of limiting the global temperature rise to 2°C. For the Republic of Djibouti, upholding this objective will be essential, given the country's heavy exposure to the impact of climate change. Adaptation and increased resilience will remain the priority for the country.

DJIBOUTI’S CONTRIBUTION TO ADAPTATION

Objectives, national priorities and long-term vision

In recent years, climate change has already appeared in the form of increases in average global temperature and in the intensity and frequency of extreme weather events like drought and flooding of oueds. For example, the minimum temperature recorded in Djibouti City has risen by close to 1.3°C in the space of 30 years. In addition, the geographical location of the Republic of Djibouti makes it directly vulnerable to the rising sea level, especially given that 88% of its population lives along the coastline.

These difficult conditions cause serious problems in terms of the availability of a sufficient quantity and quality of water resources, be it for the country’s human population, livestock or agriculture. The aquifer’s resources are no longer enough to meet the country’s multiple needs.

The Republic of Djibouti also boasts relatively significant land-based biodiversity (mangroves, Day Forest and endemic species). However, it is stricken by the ongoing shrinkage of its arable land and its biodiversity due to rapid desertification, which will only be exacerbated with rising temperatures. Likewise, in respect of marine ecosystems, more than half the coral cover is likely to disappear in the years to come.

This deterioration could have a profound effect on the local populations that are dependent on those resources and who already live in poverty. The various impacts of climate change engender major financial and human losses, primarily in the nation’s capital but also in the rest of the country. As a result, national adaptation priorities have been defined for 2035, broken down into multiple strategies. Concerning adaptation, this will entail:

- Reducing vulnerability to drought;
- Protecting against rising sea levels;
- Improving access to water;
- Protecting biodiversity;
- Reinforcing the resilience of rural populations.

Strategy and planning

Funded adaptation measures

<p>Global Climate Change Alliance project</p>	<p>Two projects have been carried out by means of the GCCA’s Intra-ACP (Africa, Caribbean and Pacific) programme. They involved the mapping and implementation of a reuse plan for the water treated in Douda, as well as a study on the emission factor for the electrical power grid.</p> <p>Funding: GCCA donors.</p>
<p>Support programme to reduce vulnerability in coastal fishing areas (PRAREV-PÊCHE)</p>	<p>The programme’s overarching objective is to support the populations in rural coastal zones affected by climate change in order to improve their resilience, reduce their vulnerability to such changes and promote the co-management of marine resources. The rehabilitation of mangroves will enhance their role as a shield for coastal protection against the tides</p>

	<p>and erosion. In addition, the restoration of coral reefs and mangroves will generate additional revenue through the development of ecotourism activities.</p>
	<p>Funding: International Fund for Agricultural Development.</p>
<p>Implementation of priority NAPA actions to strengthen resilience in Djibouti's most vulnerable coastal zones</p>	<p>The project will adopt an integrated approach that combines local actions to improve the resilience of the communities and the ecosystems with central actions to remove any key political and institutional obstacles. The project includes activities grouped together into three components, corresponding to the priorities defined in the National Adaptation Programme of Action (NAPA): i) policy; ii) ecosystem rehabilitation; and iii) climate forecasts and the prevention of catastrophes. Launched in 2011, this project focuses on two rural coastal communities, Khor Angar and Damerjog.</p>
	<p>Funding: UNEP.</p>
<p>Innovative desalination plant in Djibouti, fuelled by renewable energies</p>	<p>This project aims to construct a desalination plant in the capital city in order to respond directly to drinking water supply needs. This new plant, which will have a capacity of 22,500 m³ daily, easily expandable to 45,000 m³, will be fuelled by renewable energy, which is expected to be provided by a wind farm planned for the second phase of the project.</p>
	<p>Funding: European Union.</p>
<p>Rural Community Development and Water Mobilization Project (PRODERMO)</p>	<p>The project's objective is a participatory approach to managing water and agro-pastoral resources in general, in which the beneficiary communities will play an essential role in identifying, preparing, implementing, supervising, utilizing and maintaining community and sub-project investments.</p> <p>The main component of this project concerns surface water mobilization and sustainable land management. This encompasses, among other activities, the repair and construction of tanks for drinking water and livestock, the construction of two small experimental dams, and sustainable land management with a view to protecting hydraulic infrastructure and regenerating plant cover in the surrounding area.</p>
	<p>Funding: World Bank.</p>
<p>Drought Resilience and Sustainable Livelihood Programme of the Horn of Africa (DRSLP-HoA)</p>	<p>This programme is a response to the severe water shortages and prolonged periods of drought affecting the country. It helps to reduce poverty, improve food security and accelerate economic development by increasing incomes in rural environments. The area of intervention includes the Beyya Dader watershed in the Ali Sabieh Region, the Gaggade-Derela watershed in the Dkhil Region, and the Weima watershed in the Toudjourah-Obock Region.</p>
	<p>Funding: African Development Bank.</p>
<p>SHARE - Drinking Water: Improving access to drinking</p>	<p>This programme contributes to the attainment of the Millennium Development Goals (MDGs) by improving access to drinking water and through capacity-building in peri-urban areas in Djibouti and three</p>

<p>water</p>	<p>regional administrative centres. This project will also conduct a preparatory study in advance of a rural action.</p>
	<p>Funding: European Union.</p>
<p>Water supply project between Djibouti and Ethiopia</p>	<p>This cross-border project aims to build a water pumping plant and aqueducts for the conveyance of water from Ethiopia in order to supply the Ali Sabieh, Dikhil and Arta Regions, along with Djibouti City. It will have a capacity of 100,000 m³/day, or 1,157 l/sec, carried to the border between the two countries. A reservoir of 20,000 m³ will be built in Djibouti. The project's objective is to provide the populations with access to affordable drinking water.</p>
	<p>Funding: Republic of Djibouti.</p>
<p>Development of agro-pastoral perimeters as a strategy for Djibouti's poor rural communities' adaptation to climate change</p>	<p>The project's objective is to diversify and bolster resilience to climate change among the agro-pastoral practices used in the rural regions of Djibouti. It is based on three components:</p> <ul style="list-style-type: none"> ▪ Long-term, guaranteed access to water resources within a context of climate change; ▪ Shaded agro-pastoral perimeters to support and diversify the climate resilience of agro-pastoral systems; ▪ Secure access to funding for climate resilience, in the interest of the development of agro-pastoral companies.
	<p>Funding: UNDP.</p>
<p>Strategic Individual Sanitation Plan for the Dikhil Region</p>	<p>This Strategic Individual Sanitation Plan aims to identify improved, sustainable sanitation solutions for populations without access to a collective sanitation service (sewer system) in:</p> <ul style="list-style-type: none"> ▪ Rural settings that are scattered, often nomadic, or just beginning to settle down; ▪ The district administrative centres of Ali Sabieh, Dikhil, Arta-Wea, Tadjourah and Obock; ▪ The peripheral neighbourhoods of Djibouti, particularly those to the west of Ambouli Oued.
	<p>Funding: World Bank and UNICEF.</p>
<p>Support for adaptation to climate change among rural communities in mountainous regions</p>	<p>This project helps to strengthen the resilience of Aidalou Assamo populations in the face of shocks related to climate change.</p>
	<p>Funding: UNDP.</p>
<p>Pastoral system security project – PSSP/SHARE (2014)</p>	<p>This project aims to boost the security of pastoral systems and strengthen the resilience of pastoral populations in the coastal district of Tadjourah to external shocks. This is based on the reinforcement of</p>

	<p>pastoral communities' livelihoods through investments in water and animal health, the diversification of sources of livelihoods, and institutional capacity-building for State services and the rural communities.</p>
	<p>Funding: European Union.</p>
<p>Set-up of pilot solar projects to fight poverty</p>	<p>This project, steered by the Secretary of State in charge of National Solidarity and the ADDS (Djibouti Social Development Agency), provides solar electricity to rural areas as an instrument for poverty reduction. Various mechanisms have been rolled out in Djibouti City and in the countryside, including personal kits, street lights, a mini power plant, drinking water supply and solar-powered light bulbs.</p>
	<p>Funding: Republic of Djibouti.</p>
<p>Implementing Adaptation Technologies in the Fragile Ecosystems of the Tadjourah and Hanlé Plains</p>	<p>The project's objective is to set up climate change adaptation measures to protect and enhance the resilience of the local communities and the ecosystems in the Tadjourah and Hanlé Regions.</p> <ul style="list-style-type: none"> ▪ Component 1: Protection against water-related climate change; ▪ Component 2: Rehabilitation of ecosystems (plant cover in Hanlé and Tadjourah, and mangroves in the coastal zone of Tadjourah); ▪ Component 3: Sustainable, resistant means of subsistence; ▪ Component 4: Incorporation of adaptation to climate change as part of the development and resilience of the communities.
	<p>Funding: UNEP.</p>
<p>Support project for the resilience of rural populations</p>	<p>The funds allocated under the 11th European Development Fund (EDF) will target the following sectors:</p> <ul style="list-style-type: none"> (a) Water and sanitation; (b) Food security. <p>The actions planned for those two sectors will aim for the equitable development of the country's rural and underprivileged areas, with an emphasis on strengthening the resilience of vulnerable populations. The proposed actions will be subject to climate change impact reduction requirements, dictated by strict environmental criteria. As the country contains a number of already weakened ecosystems, any work done to improve food security and water resources management will need to endeavour to preserve the environment from a perspective of sustainable development.</p>
	<p>Funding: European Development Fund.</p>

Adaptation measures pending funding

<p>Creation of a second</p>	<p>The creation of a single desalination plant will not suffice to meet the</p>
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desalination plant	population's drinking water needs, which totalled some 593 million m ³ in 2011. As a result, the rapid launch of the construction of a second desalination plant could be envisaged.
Repairs to water mains	Water loss within the water supply network is estimated at more than 30%. This is a considerable loss, further aggravating water shortages. Bringing the mains up to standard therefore appears to be a vital step. Such an investment has not yet been costed, however.
Construction of new dykes	The safety of the coastal zone is crucial to Djibouti's development. Faced with rising sea levels, many cities that are vulnerable to this threat, such as New York and the majority of Dutch cities, have already prepared dyke construction investment plans. This solution has not yet been studied for Djibouti, but it could certainly be considered. For informational purposes, the plans launched by the Netherlands amount to a total of more than €20 billion, for exposure similar to that of Djibouti.
Construction project for a dam in the Ambouli watershed	Djibouti City, the national capital, is regularly threatened by devastating floods from the Ambouli watershed, with the loss of human life and serious material and economic damage. The construction of a dam in that watershed could considerably reduce the effects of flooding and could also serve to restock the groundwater that supplies the capital.

IMPLEMENTATION METHODS

Capacity-building

Given the weakness of its economic and financial capacities and the scale of its funding needs for poverty reduction, environmental management and sustainable development, Djibouti is one of the potential beneficiaries of this initiative. To be able to seize that opportunity, the country set itself the objective of developing a National Strategy for a Green Economy, which will enable it to better incorporate climate finance into its development, as well as a national strategy for preserving biodiversity and another on climate change in order to boost its resilience in respect of the harmful effects of climate change, whilst contributing to global efforts to reduce greenhouse gas emissions.

Need for technology transfers

The majority of the options presented above, such as the construction of a geothermal, wind or photovoltaic power plant, will necessitate major technological transfers. It is therefore crucial for the Republic of Djibouti to establish long-term partnerships with university centres or private companies capable of supplying those technologies. At present, an important partnership with the German Cooperation is providing Djibouti with technical and financial support for the promotion of renewable energies.

Funding needs

In a 6% growth scenario, the investment required to maintain an emissions level similar to that of 2010 (conditional scenario) is more than US \$5.5 billion. The unconditional scenario, which is already financed, either by means of the national budget or through the support of the international community, represents approximately 70% of that amount.

For the measures forming the conditional scenario, whose cost is estimated at US \$1.65 billion, it has yet to be determined the proportion of that investment that could be covered domestically. The national strategy for energy procurement and management, currently under development, should provide better visibility on this point. Nonetheless, considering the level of investment required, it is very likely that Djibouti will need to access international funding to cover a large proportion of that investment.

The adaptation projects currently being implemented account for a budget of nearly €100 million. That sum represents just 12% of the total amount that will need to be invested in adaptation under the 2°C Scenario, and a mere 7.5% in the case of the 4°C Scenario.

These figures show that investing in adaptation measures is a crucial issue for the Republic of Djibouti. The country will not be able to raise the necessary funds on its own. As a result, the mobilization of the international community will be vital.

Details of the implementation methods are provided in a dedicated document entitled “*Guide de mise en œuvre pour la Contribution Prévues Déterminées Nationales*” (“Implementation Guide for the Intended Nationally Determined Contribution”).

INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC) OF THE COMMONWEALTH OF DOMINICA



Communicated to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) on the 30th September, 2015

The Commonwealth of Dominica is committed to the successful conclusion of negotiations under the Ad-Hoc Working Group on the Durban Platform for Enhanced Action (ADP) in order to adopt, at the 21st meeting of the Conference of Parties (COP21) in Paris, a new legally-binding agreement under the United Nations Framework Convention on Climate Change (UNFCCC) appropriate and fair to all Parties, which will come into effect and be implemented from 2020 onwards. Dominica hereby communicates its Intended Nationally Determined Contribution (INDC), in accordance with the relevant paragraphs of Decisions 1/CP.19 and 1/CP.20, towards achieving the ultimate objective of the Article 2 of the Convention, which provides up-front information to facilitate the clarity, transparency and the understanding of the INDC. Dominica is also pleased to provide additional accompanying information relating to mitigation, adaptation planning/management and support for implementation.

Intended Nationally Determined Contribution

Dominica as a small island developing State is vulnerable to current and ongoing impacts from climate change. Facing ever escalating social, environmental and economic costs from such impacts, the priority of the Government of Dominica is to implement the comprehensive Strategic Program for Climate Resilience contained in the *Dominica Low Carbon Climate Resilient Strategy* (2012). For Dominica, there is little distinction between adaptation and mitigation measures – an integrated response is being implemented to build climate resilience in vulnerable communities, while enabling Green Growth through the transition to sustainable energy technologies. Recognising Dominica's common but differentiated responsibility and limited capabilities to address climate change, Dominica commits to progressively reduce total gross greenhouse gas (GHG) emissions below 2014 levels (164.5 Ggs est.) at the following reduction rates:

17.9% by 2020; 39.2% by 2025; and 44.7% by 2030.

By 2030, total emission reductions per sector will be as follows:

- Energy industries – 98.6% (principally from harnessing of geothermal resources);
- Transport – 16.9%;
- Manufacturing and construction – 8.8%;
- Commercial/institutional, residential, agriculture, forestry, fishing – 8.1%;
- Solid waste – 78.6%.

Benefiting from sound management practices, Dominica forests will continue to sequester 100 Ggs of national GHG emissions on an annual basis during the period 2020 to 2030. The commercial development and continued harnessing of Dominica's geothermal resources will, from 2025 onwards, enable the country to export significant amounts of renewable energy (estimated to exceed 200 Ggs annually) to the nearby French Territories of Martinique and Guadeloupe, thereby contributing to global efforts to reduce GHG emissions.

This contribution is conditional upon receiving timely access to international climate change financing, technology development and transfer, and capacity building support for priority adaptation and mitigation measures. Dominica's INDC will remain provisional pending confirmation of timely access to international climate change financing, technology development and transfer, and capacity building support for priority adaptation and mitigation measures detailed in this INDC. Dependent upon COP21 outcomes, Dominica reserves the right to revise the INDC.

Country Context

Dominica has always been in a vulnerable position economically, socially, culturally, and environmentally given its susceptibility to natural disasters and its ecological and economic fragility. Vulnerability to climate change in Dominica, like many Small Island Developing States (SIDS), is aggravated by external pressures affecting its resilience and adaptive capacity such as terms of trade, impacts of globalisation (both positive and negative), financial crises, international conflicts, external debt, externalization of the benefits of foreign direct investment at the expense of the local population, and internal local conditions such as population growth, reliance of fossil fuel imports, incidence of poverty, inadequate social capital, unemployment, limited resource base for economic development, reduced social cohesion, and a widening gap between poor and rich, together with the interactions between them. It is widely acknowledged that climate change exacerbates impacts from natural disasters with enormous human, environmental and economic costs.

‘Flood swamped villages, destroyed homes and wiped out roads. Some communities are no longer recognizable...’
‘The extent of the devastation is monumental. We have in essence to rebuild the country.’ Prime Minister, Hon. Roosevelt Skerit, describing the situation in Dominica in the aftermath of Tropical Storm Erika which left many people dead and injured, over 500 persons homeless, and devastated the country on the morning of 27th August, 2015, resulting in US\$392.3 million in damages (representing 75.88% of GDP).

Recognising the threats posed by climate change, Dominica has, over the last two decades, undertaken a number of initiatives to respond to this threat. Dominica has established a strong track record on climate change adaptation, and in this regards was one of the first countries in the Caribbean region to adopt a *National Climate Change Adaptation Policy* (2002). Dominica was one of the few countries chosen to pilot adaptation measures under the *Special Program on Adaptation to Climate Change* (SPACC), and pioneer the development of a strategic programmatic approach to building climate resilience under the *Pilot Program on Climate Resilience* (PPCR). In 2012, the Cabinet-approved *Dominica Low Carbon Climate Resilient Strategy* was developed through broad-based stakeholder engagement and input, with support provided by the Climate Investment Funds (CIF). Additionally, as a collaborative initiative between the SPACC program and the Global Environment Facility (GEF) funded Sustainable Land Management (SLM) project, Dominica has pioneered: (a) the vulnerability mapping and “climate proofing” of National Parks Management Plans; and (b) community-based vulnerability mapping and the development, through community engagement and input, of community adaptation plans. Methodologies for adaptation planning and management developed by Dominica under these programs have been promoted as models of best practices by a number of international agencies.

In the global context, ***until around 2005 Dominica’s contribution to global greenhouse gas emissions was nil, due to the small size of the country’s economy and population, combined with the ability of the large expanse of the country’s forested areas (comprising 63% of the total land area) to sequester greenhouse gases at levels that exceeded national GHG emissions from anthropogenic activities.*** Nonetheless, Dominica is a country committed nationally and internationally to addressing climate change. Due to the exceptionally high level of vulnerability to climate impacts, Dominica’s national priority is to enhance community, ecosystem and national resilience to climate change and natural disasters, including through the implementation of viable sustainable energy and other mitigation measures, which reduce reliance on imported fossil fuels, while building local resilience, capacity and self-sufficiency. In this regard, the harnessing of the country’s geothermal resources over the next decade will considerably reduce Dominica’s reliance on imported fossil fuels as the principal source for electricity, and will liberate considerable resources spent on fuel imports which can be directed to priority adaptation measures to build resilience in vulnerable communities and sectors. Continued expansion of Dominica’s geothermal resources from 2025 onwards will enable the country to export significant amounts of renewable energy to nearby countries, thereby contributing to global efforts to reduce greenhouse gas emissions.

Information on Dominica's INDC

Parameter		Information
Period of implementation		Beginning in 2016 and ending in 2030
Type of commitment		Absolute reduction from base year emissions
Base year		2014
Scope and coverage	Emissions reduction impact	Emissions will be reduced by 44.7% from 2014 levels.
	Sectors and conditional targets (Conditional upon receiving timely access to international climate change financing, technology and capacity building support)	<ul style="list-style-type: none"> • Energy industries – 98.6% (principally from harnessing of geothermal resources); • Transport – 16.9%; • Manufacturing and construction – 8.8%; • Commercial/institutional, residential, agriculture, forestry, fishing – 8.1%; • Solid waste – 78.6%.
	Greenhouse Gases (GHGs)	Carbon Dioxide (CO ₂), Methane (CH ₄), Nitrous Oxide (N ₂ O), Hydrofluorocarbon (HFC)
Geographical boundaries		Whole country
Methodological approaches for estimating anthropogenic greenhouse gas emissions and removals		This INDC was prepared using the IPCC 2006 greenhouse gas inventory methodologies, and GHG emissions intensity factors from the Carbon Trust.
Planning process		<p>This INDC has been developed through broad-based stakeholder consultation and input, and builds upon key national policies and strategies including:</p> <ul style="list-style-type: none"> ○ <i>National Climate Change Adaptation Policy (2002)</i>; ○ <i>National Capacity Self Assessment (NCSA) (2004)</i>; ○ <i>Growth and Social Protection Strategy (GSPS)</i>; ○ <i>Dominica's Low Carbon Climate Resilient Development Strategy</i> and compendium Strategic Program on Climate Resilience (SPCR) (2012); ○ <i>Dominica's National Energy Policy (draft) (2014)</i>; ○ <i>Dominica's Sustainable Energy Plan (draft) (2014)</i>.
Intention to use market-based and non-market-based mechanisms to meet target		Dominica intends to introduce market-based mechanisms to promote energy conservation/efficiency and reduce greenhouse gas emissions from the transport sector principally through incentives to promote the import of hybrid vehicles.
Assumptions and Methodological Approaches		
<p>When calculating or making reference to GHG emissions, the methodologies used to estimate those emissions in relevant sectors correspond to the 2006 IPCC Guidance for Conducting National Greenhouse Gas Inventories and assume Global Warming Potential (GWP) values for a residence period in the atmosphere of 100 years pertaining to the Second Assessment report of the IPCC. Carbon sequestration potential and emissions from the land use, land-use change and forestry (LULUCF) sector, used the FAO's Global Forest Resource Assessment for Dominica and the 2003 IPCC Good Practice Guidance for LULUCF.</p>		

ACCOMPANYING INFORMATION ON NATIONAL CIRCUMSTANCES, PRIORITY ADAPTATION AND MITIGATION MEASURES, MEANS OF IMPLEMENTATION AND EQUITY

National Circumstances

Dominica is located at 15 degrees North and 61 degrees West, occupying a central position in the eastern Caribbean archipelago. The country is bordered by the French territories of Guadeloupe and Martinique to the north and south respectively. The island is approximately 750.6 square kilometers and is the largest in the Windward and Leeward groups of the Eastern Caribbean.

Figure 1: Map of Dominica



Dominica is volcanic in origin and is characterized by very rugged and steep terrain with approximately ninety miles of coastline. The northern half of the island is dominated by the country's highest summit, Morne Diablotin, which is the highest and largest volcano in Dominica, and the second highest mountain in the Eastern Caribbean, measuring 22 km x 18 km at its base and towering to a height of 1447 meters. A chain of mountains extends from the island's center to the south, and the topography is characterized by a number of ridges and steep river valleys with gently sloping lands being restricted to narrow coastal strips, particularly in the center and northeast of the island. The island's volcanic natural history remains evident in continuing seismic activity, and in scenic attractions such as the Valley of Desolation and the Boiling Lake, which together with dense forests populated with an abundance of natural lakes and waterfalls, provide the basis for a growing eco-tourism industry. Dominica has a forest area of 45 000 hectares – more than half of the island's 75 000 hectare over all land area. Dominica has rich volcanic soil and is well served by over 365 streams and rivers. The high mountains and deep ravines are covered in rich tropical forests. Since 1975, an extensive system of national protected areas constitutes a significant carbon sink and provides protection for approximately 20% of the national territory. Protected areas include one marine park, two large forest reserves (Central and Northern), and the Morne Trois Pitons National Park, a UNESCO World Heritage Site.

Dominica is part of a group of 47 countries and territories that have been classified by the United Nations (UN) as Small Island Developing States (SIDS). SIDS face a specific set of challenges and are especially highly vulnerable to the effects and impacts of climate change.

Climate and Vulnerability

Dominica's climate is characterized as tropical maritime with dominant influences being the Atlantic Ocean, the Caribbean Sea, and the northeasterly trade winds. As a result of its mountainous terrain the island possesses a number of micro-climates. Rainfall is distributed between a dry season from December to May, and a rainy season from June to November. The western Caribbean coast is in the rain shadow of the various mountain ranges and average rainfall along that coast is significantly less than in interior locations. Limitations in measuring equipment have restricted the ability to maintain meteorological records of interior areas. High rainfall makes the island susceptible to landslides, particularly in mountainous areas. Dominica's rugged topography results in considerable amount of orographic rainfall.

The island's climate is characterized by consistently warm year-round temperatures with a daytime average of 26-27 degrees Celsius in coastal areas decreasing to 19-21 degrees Celsius in mountainous areas, while night-time temperatures vary from 18-22 degrees Celsius on the coast and 10-12 degrees Celsius at higher elevations.

Rainfall patterns display considerable variability both on annual and locational basis. Nevertheless, Dominica's mountainous terrain makes it the wettest island in the eastern Caribbean with annual rainfall totals exceeding 10,000mm (400 inches) in some of the higher elevations. The island experiences a dry season between the months of February to June, with November being statistically the wettest month. Relative humidity remains high throughout the year consistently averaging above 85% in mountainous interior areas. Generally rainfall is less on the island's western Leeward coast which, based on the prevailing winds, is within a rain-shadow of the mountainous interior.

The island lies within the Atlantic hurricane belt. Since the late 1970s the island has been increasingly affected by a number of hurricanes and tropical storms. In 1979 Hurricane David caused extensive destruction particularly in the southern parts of the island. In 1995, Hurricane Luis also caused widespread damage and in August 2007 Hurricane Dean struck the island causing widespread damage to agricultural outputs as well as to road infrastructure estimated at almost 20 percent of GDP. Tropical Storm Ophelia in 2011 and Tropical Storm Erika in August 2015 resulted in loss of life and property and devastated the island.

Dominica was originally populated by Amerindian peoples, known as Kalinago, and is the only island in the Caribbean still to possess distinct communities of these indigenous people of the Caribbean. Population estimates for 2001 indicate that Dominica had a population of approximately 71,000 persons (a decline from 74,750 in 1994), including two thousand Kalinagos, the remaining survivors of the first inhabitants of the island. 27.0% of the Dominican households live below the poverty line (based on the latest available figures), Topographic conditions have forced human settlements onto narrow coastal areas particularly in the south and west with approximately 44,000 persons (62%) living along the coast. The largest community is Roseau (the capital city) and its environs with 14,847 persons representing almost 21% of the total population.

Dominica, like its Caribbean neighbours, is among the most vulnerable regions to global climate change (IPCC, 1995, 1997, 2001, 2007). Sea level rise will combine a number of factors resulting in accelerated coastal erosion, increased flood risk and in some areas permanent loss of land. This may be exacerbated further by any increase in the destructiveness of tropical storms, the impacts of which will be greater due to sea-level rise even without increases in storm intensity. The impacts of sea-level rise will be further exacerbated by the loss of protective coastal systems such as coral reefs. The Caribbean has experienced widespread coral loss in recent decades due to a variety of interacting factors including bleaching, which has become more frequent due to higher ocean surface temperatures, a trend which will continue into the future as a result of climate change. Impacts attributed to climate change in Dominica are: a change in average climate; sea-level rise; changing distribution of carriers of disease; increased incidence of hot

days; changes in rainfall patterns; more acidic oceans (less CO² dissolved in warmer ocean water); a change in the incidence and intensity of extreme weather events (storm surge, flash floods and tropical hurricanes). Vulnerability of human settlements in Dominica to existing weather and climate change can be viewed in terms of risks from coastal processes, inland flooding, and landslides. A consistent feature of human settlements in Dominica is the vulnerability of roads and buildings to storm surge flooding and landslides. Inadequate planning controls are apparent in the continuing construction of buildings, critical infrastructure and other facilities in active wave inundation, flood- and landslide-prone areas.

Economy

With GDP standing at US\$517million (2014 - IMF estimates), the Dominica economy reflects many of the traditional features of a small open economy. This includes a high level of dependence on external trade as a proportion of gross domestic product (GDP), dependence on single sector export products (in this case agriculture) and tourism revenue, high levels of underemployment and unemployment, and dependence on foreign capital (both public and private sector) for investment into productive sectors and for infrastructural development. Over the past 10 years, economic growth in Dominica averaged approximately 3.7% per annum, dropping to 1.5% over the past 5 years. The population of the country has remained relatively unchanged over recent years (approximately 70,000), and is not expected to increase in the next 10-15 years. Since the year 2000, contributions to GDP have increased in the agricultural, private education and hospitality industries, with declining trends in manufacturing, real estate and banking.

The vulnerability of Dominica's agricultural sector – which together with tourism is the mainstay of the country's economy - is manifested in the risks presented by natural disasters and climate extremes, as well as in the sectors vulnerability to climate variability and external economic shocks. The World Bank points out that Dominica's real agricultural sector product and agriculture's share of GDP has fallen consistently with each major natural disaster with the sector failing to recover to previous levels of relative importance. Most of this decline is attributable to the crop sector, and within that sector, to the decline in banana production. Otherwise there has been significant growth only within the small livestock sub-sector. The World Bank indicates that “the post disaster shift out of agriculture seems to be explained by a combination of a further reduction in larger scale production (failure to invest fully in replacement), a shift of small shareholders into employment in other sectors, and also off-island migration”.

Agricultural production accounted for 12.2% of total GDP, and overall the sector is estimated to have declined by 10.6 percent in 2010 on the heels of a 1.5 percent growth rate for 2009. The performance of the crops sub-sector was severely affected by the extended drought in 2010. Agriculture's decline has been particularly marked since Hurricane Hugo. Crop sector product in real terms in the late 1990s was 20% below the 1988 peak caused primarily by the decline of the banana industry, which has maintained this pattern during the 2000s. Agricultural access roads have been severely damaged or destroyed by Tropical Storm Erika in August 2015, which resulted in losses to the agriculture sector of US\$30.83 million (est), creating additional challenge to the sector. For a country that could be self-sufficient and provide food to neighbouring countries, Dominica's food imports constitute an increasing burden on the economy, and threaten food security. Impacts from climate change, affecting agricultural productivity, continue to aggravate this situation.

With the rapid decline in the major cash crop (bananas), many farmers began moving into the fishing sector, which employs approximately 2000 registered fishermen (40% full-time). There is a much greater demand for fish at the present time as a major source of protein. Dominica's fishery resources are relatively diverse including near-shore demersal and pelagic species, as well as deep-water pelagics and various crustaceans and other marine species. The Dominica fishing industry is small-scale and of an artisan nature. All the fish caught is for local consumption. Most fish landed in Dominica is sold directly to the public at the landing sites. The damage caused by Hurricane Lenny in 1999 on the Roseau Fisheries

Complex were very obvious during the following fishing season when there was a marked increase in tuna landings, however, the lack of storage facilities posed a major problem in terms of selling the catch. This resulted in wastage and the loss of revenue to fishermen. Already fishery resources face considerable stresses from a number of land based sources of pollution. Existing climate stresses especially hurricane/tropical storm systems and warming oceans present important challenges for the health and sustainability of the ecosystems that sustain the islands fisheries. Climate change, including increasing ocean acidification and changes in sea temperatures, are affecting fisher resources and migration patterns with consequent impacts on the sustainability of Dominica's fishery sector, livelihoods, human health and prospects for food security. Climate change impacts on Dominica's vibrant diving and whale-watching industry are yet to be determined.

The island has always been in a vulnerable position economically, socially, culturally, and environmentally. Economic developments, in particular, are significantly affected by both natural and man-made external factors as is increasingly evidenced by the negative impact on the local economy of changes associated with such international phenomenon as globalization and trade liberalization. The dependence of the economy on the constricting banana industry exposes its high economic vulnerability. Attempts to diversify are slow, however recent trends indicate that the island is moving towards tourism/ecotourism, as it markets its unique environment and culture. In doing so Dominica has become more acutely aware of the need to protect the environment and of the growing threat to its vulnerable natural resources presented by climate change.

The prevailing economic situation over the past twenty years has given rise to sluggish growth and little improvement in the levels of poverty. The present government was compelled to establish a programme of Economic Stabilization and Recovery in early 2001, which was aimed at, among other things maintaining fiscal stability and energizing economic growth. The stabilization programme, which imposes stringent austerity measures, is intended to reduce public sector expenditure to sustainable levels in line with required standards set by international agencies such as the International Monetary Fund (IMF) and World Bank (WB). Now in 2015, while still facing social and economic challenges, there are indications that Dominica is making steady progress on the road to recovery.

Energy and Carbon Footprint

Dominica has no petroleum resources, and energy required to sustain development in the country is imported. Annual import costs for energy continue to rise and are currently EC\$116.65 million (US\$43.39 million) representing 11.92% of GDP (2014 – World Bank estimates). Electricity constitutes the primary source of commercial energy for industrial and other uses in Dominica, while approximately 8000 cubic meters of woodfuel are used domestically. The main end users of electricity are domestic, commercial and institutional customers and the pattern of consumption demonstrates the low energy use of industry and other non-domestic consumption at this time. The other main source of energy use in Dominica is in the road transport sector. As in most other developing countries road transport consumes an increasing amount of petroleum.

As with all other island states and territories in the Caribbean, Dominica is affected by the global crisis caused by its dependency on imported petroleum products with the constant fluctuations in prices. High electricity costs (the highest in the Caribbean), constitute a real obstacle for numerous sectors, with the direct and indirect consequence of curtailing growth and parallel activities linked to the country's sustainable development. Dominica recognises that current high costs associated with importation of fossil fuel-based energy is unsustainable, a draw on the economy, diverts much needed resources from priority poverty reduction and social development programs, and reduces the availability of funds needed to address impacts from climate change and natural disasters.

Electricity Network and Demand

The country presently (2014) has an installed capacity of 26.74 megawatts consisting of 6.64MW (28.5%) of hydropower and 20.1 MW of diesel powered units. The generation mix is characterized by seasonal fluctuations in supply from hydro-generation as a result of changes in precipitation during the rainy season. Peak demand has averaged approximately 16 MW over the past three years, with average demand of 11.5 MW. Minimum overnight demand has averaged 7.3 MW over the past 3 years, requiring approximately 8 MW of generation online (9.6% losses).

From 2012 to 2014, minimum instantaneous demand has varied between 6MW and 8.5MW, averaging around 7.3MW for the past 3 years. Some large consumers of electricity (hotels, manufacturers, university) self-generate using diesel engines as this provides lower costs electricity than provided by the domestic electrical utility. The Independent Regulatory Commission (IRC) has established a limit of 1MW of grid connected intermitted renewable energy, of which approximately 0.5 MW has already been installed. An additional 125kw community renewable energy system is being considered.

Electricity sales have grown on average 3.7% per annum over the past 10 years, with much of this between 2008 and 2010. Over the past 3 years there has been no growth due to the depressed economic climate. Corresponding to this has been a decline in electricity consumption in the domestic sector. The proportion of electricity sold in the commercial sector has increased, which reflects growth in the hospitality, tourism and higher education sectors. The 20 year forecasts for electrical sales provided by Dominica Electric Company (DOMLEC) indicates average growth rates of 1.3% and 0.8% for yearly electricity generation and peak demand respectively, based on assumed economic growth rate of 1.6%.

Development of Alternative Energy Sources

The Government of Dominica in seeking to reduce the increasing costs of electricity generation and ensure a cleaner, more environmentally friendly energy source is aggressively exploring the possibilities of alternative energy. While hydroelectric generation does occur (contributing up to ~ 38% of electricity generation), and Dominica has considerable additional potential, hydro-power development is severely affected by changing precipitation patterns association with climate change. Dominica, being a volcanic island has tremendous potential for geothermal energy. Site assessments, and feasibility studies have been carried out that indicate that the energy capacity in the Roseau Valley Geothermal Resource area is at least 300 MW, The current production capacity based on Wells already drilled is approximately 10 MW. Further generation capacity can be added with the drilling of additional production wells as assessed and necessary.

A limited amount of solar and wind energy is used in Dominica, mainly at the residential and commercial levels for both water heating and electricity production. It is hoped that hydro, solar, wind, wave and biomass as alternative energy sources, will eventually be considered on a commercial scale. Dominica's *Low Carbon Climate Resilient Development, National Energy Policy* (draft) (2014), and *Sustainable Energy Plan* (draft) (2014) establishes indicative targets for renewable energy in Dominica.

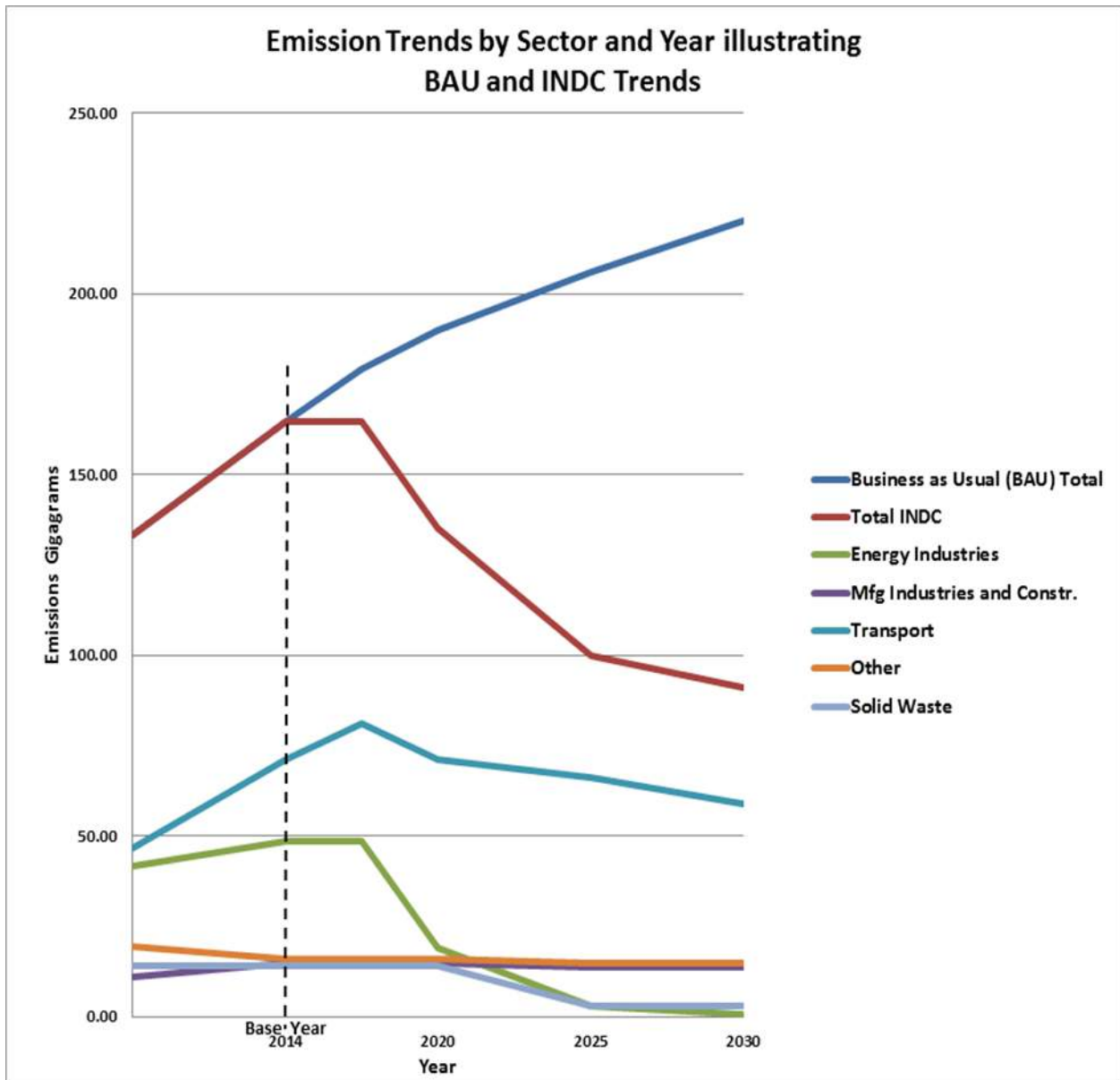
GHG Projections for 2015-2030

The Graph below depicts:

- The Business as Usual (BAU) case from 2005 to 2030;
- The total emissions from 2005 to 2030;
- The emissions trends by Sector and year from 2005 to 2030.

The BAU case used Table 2.6 from Dominica's Second National Communication (SNC), which provides emission changes from 2000 to 2005, as its starting point. It provides emissions data on four of the five sectors. The data for the fifth sector, solid waste, was also obtained from the SNC. The projections for

emissions post 2014 for each sector were derived from the application of the energy intensity value for each of the mitigation measures analyzed and further breaking down this data by reporting year. The total emissions for each year were the total of the sector emissions for that year.



Proposed Mitigation Measures to Enhance Resilience

In order to achieve the GHG targets contained in this INDC, Dominica intends to implement the following measures to enhance resilience, which amounts to approximately US\$99 million in costs.

1. New Geothermal Generation Plants.

It is the intention of the Government of Dominica to develop, with concessionary climate change financing provided under the Green Climate Fund or Clean Technology Fund, a geothermal generation plant to provide electricity to the domestic market. The first phase of this plant will comprise 2 X 3.5MW

electricity generation units, with the physical plant designed to accommodate another 3.5MW generator in the future. The first, 2 X 3.5MW plant is planned for operation before 2020, with the third 3.5MW 2025. The Government of Dominica seeks to harness geothermal resources in manner and at a cost that will ensure that electricity charges to consumers do not increase.

Program Timing: 1st Plant; 2020, 2nd (expansion); 2025;

Forecasted Emission Reductions: 39.3Gg;

Capital Cost Estimate: US\$75,000,000.

2. Energy Efficiency (EE) Programme

This EE program will be country wide, and will include the Manufacturing, Commercial and Institutional sectors. Such programmes carried out in other jurisdictions in the Latin America and Caribbean Region have resulted in energy savings in the order of 15 to 20% of total energy usage, and should achieve similar results in Dominica. Market based mechanisms are to be introduced to enhance the uptake of these programmes. The EE programme for Dominica will be designed and implemented to address the specific issues of this country and shall focus on retrofitting of energy efficient lighting, air-conditioning, appliances, and a vigorous education and awareness drive. Estimated installation costs have been based on the results of the audits of similar facilities in the LAC Region.

Program Timing: 2016-2025;

Forecasted Emissions Reduction: 5.2 Gg; Installation;

Cost Estimate: US\$2,300,000.

3. Solar Photovoltaic (PV) conversion program for Hotel Sector

This sector includes hotels and guesthouses. There are approximately 29 such facilities in Dominica, but there is insufficient detail provided to determine size and individual energy usage. Estimates have been made to derive the quantity of systems that may be involved and anticipated GHG reductions based on lessons learned from similar conversions undertaken in the region. The solar PV programme will comprise the installation of solar PV panels and related equipment on the roofs (and in some cases, the grounds) of buildings in this sector.

Program Timing: 2016-2025;

Forecasted Emissions Reductions: 0.24Gg;

Capital Cost Estimate: US\$1,000,000.

4. Solar Photovoltaic (PV) conversion program for Commercial, Institutional and Manufacturing Facilities

This program will include: schools, universities, hospitals, commercial buildings, manufacturing plants, government buildings, municipal facilities, etc. Estimates have been made to derive anticipated GHG reductions based on lessons learned from similar conversions undertaken in the region.

Program Timing: 2017-2025;

Forecasted Emission Reductions: 0.86Gg;

Capital Cost Estimate: US\$2,700,000.

5. Off-Grid Hybrid Micro-Hydro, Wind, Solar PV, DG Back-up for Ross University

Ross University is the single largest electricity user in Dominica, with significant annual electricity charges. In order to compute possible emission reductions and estimate costs, 200kW of in-stream micro-hydro, 100kW of solar PV and 500kW of wind (assuming a site is available and a reasonable wind regime is available), and 500kW of back-up diesel generation, connected as a hybrid power plant in an off-grid mini-grid configuration have been calculated as being required to meet average projected power demand at the University.

Program Timing: 2017-2022;

Forecasted Emission Reductions: 1.71Gg;

Capital Cost Estimate: US\$3,300,000.

6. Off-Grid Hybrid Wind, Solar, Biodiesel Generator Back-up in Off-grid Mini-Grid Configuration for South-East and East Coast of Dominica (three separate projects)

Based on lessons learned from Tropical Storm Erika and other recent extreme events, this region of Dominica is particularly vulnerable to storm damage, and the power systems in this area are vulnerable to damaged rendering communities without electricity. Since the amount of remaining availability of grid connected intermittent renewable energy (IRE) systems is very limited, to increase power system reliability and reduce energy costs for the residents in these locations, off-grid mini-grids, powered with hybrid wind and solar PV power plants (and hydro if available), with bio-diesel generator back-up, are proposed as a possible viable alternative. Three separate mini-grids, estimated at 500kW each, comprising 500kW of wind energy and 200kW of PV, with bio-diesel generator back-up for each, are proposed.

Program Timing: 2017-2025;

Forecasted Emission Reductions: 2.92Gg;

Capital Cost Estimate: US\$9,000,000.

7. Replace Streetlights in Portsmouth with Off-grid Light Emitting Diode (LED) Fixtures.

There are some 368, 100W HPS streetlights in Portsmouth at present. This project comprises the replacement of these with smaller, off-grid LED streetlights.

Program Timing: 2016-2025;

Forecasted Emission Reductions: 0.36Gg;

Installation Cost Estimate: US\$1,200,000.

8. Transport Sector Emissions

11,167 vehicles were imported into the country between 2005 and 2014. During that same period, 6,624 older vehicles were retired, for a net increase of 4,543 vehicles over this period. The largest percentage of these were sport utility vehicles (SUVs), with an increase of 2,950 of these during this period. Accordingly, GHG emissions during this period increased from 46.8Gg in 2005 to 71Gg in 2014. This is a very serious problem, which if not arrested, will prevent Dominica from adequately reducing GHG emissions in the future. Currently, import duties and charges amount to approximately 140% on motor vehicles imported into Dominica. Additionally, there is an environmental tax added on imported vehicles, which ranges from 1% of the total value (including freight charges) on vehicles less than 5yrs, to EC\$3,000 on vehicles older than 5yrs. Two priority steps are proposed, starting as soon as practically possible:

- (i) Introduce a policy that, all government vehicles, at their time of replacement, will be replaced by hybrids vehicles;
- (ii) Introduce market based mechanisms to motivate the private sector to buy hybrid vehicles when replacing current vehicles.

It is expected that these actions will be implemented before 2020, and will continue to the end of the reporting period, 2030, and beyond.

Program Timing: 2016-2030;

Forecasted Emission Reductions: 12Gg

9. Reduce Methane Emissions from Landfill

Dominica's existing landfill commenced operation in 2005. It is a modern, engineered landfill, with a liner, leachate collection, and capping. Methane collection vents were installed from the start, and have been venting the methane produced from the organic waste decomposition process ever since. This project will abate most of this methane by: (a) diverting organics from the waste stream that is currently deposited in the landfill; and (b) suitably preparing the landfill, and installing a flaring system. In addition, the present landfill needs to be expanded if it is expected to receive more waste within the next 5 years. The previous dumpsites that were closed off also need to be considered for methane collection and flaring system. These are the Point Ronde and Stockfarm dumpsites which were closed when the new site was commissioned. In order to further reduce methane emissions and reach our target, the present volume of

organic waste brought into the landfill (40% of all waste) has to be reduced. This can be done by implementing a fully integrated solid waste management program that involves the following:

- (i) Public awareness and extension program throughout the island;
- (ii) Curbside pickup of organic waste (separation from source with revised collection system);
- (iii) Curbside pickup of individual types of non-organic waste (separation from source with revised collection system);
- (iv) Material recovery facilities and composting facilities in selected regions on the island.

Upgrading only the landfill will not solve the problem of methane gas emissions unless what is actually brought to the landfill is managed systematically. In order to achieve this goal, upgrades and equipment will be required to the amount of US\$3,008,921.00.

Program Timing: 2016-2021;

Forecasted Emission Reductions: >11Gg;

Capital Cost Estimates: \$4,508,921

10. Other Measures

The following are other high priority measures that will commence during the 2016-2020 period, as part of the energy efficiency program:

- Education and awareness program, at school level, as well as an awareness building program for the general public;
 - Make energy efficient appliances more readily available, include their importance in the programs above;
 - Institutional strengthening at the government level, and capacity building for the private sector (e.g. contractors, maintenance personnel, and other personnel);
 - Develop and implement a climate resilient energy efficient building code (Green Building Code) including a training and capacity building program;
 - Sustainable Energy programs for private residences, including solar PV and solar thermal, using innovative financing mechanisms to offset capital costs for home owners;
- Measures to reduce GHG emissions from the Agriculture Sector including through the harnessing of biomass.

Building Climate Resilience (Adaptation)

Dominica's *Low Carbon Climate Resilient Development Strategy* provides an overview of the country circumstances, the development context and identifies climate change vulnerabilities in key sectors, for specifically vulnerable groups, for the private sector, important eco-systems and natural resources. It also provides an overview of linkages to existing development plans and programs, most importantly Dominica's *Growth and Social Protection Strategy* (GSPS) and Dominica's *National Climate Change Adaptation Policy*. Section 5 of Dominica's *Low Carbon Climate Resilient Development Strategy* contains a policy, legal and institutional analysis that list key agencies involved in managing climate change risks, together with the associated legal/policy framework.

Dominica's *Low-Carbon Climate Resilient Development Strategy* and compendium Strategic Programme for Climate Resilience (SPCR) were developed through an extensive consultative process that was supported under the Pilot Program for Climate Resilience (PPCR) funded under the Climate Investment Funds (CIF). As part of the process to develop Dominica's *Low-Carbon Climate Resilient Development Strategy* and SPCR, various assessments and studies were undertaken and reviewed with and by national stakeholders to provide the technical foundation for the preparation of the Strategy and this compendium SPCR. Key steps in Dominica's SPCR prioritization planning process included:

- (a) **Document stocktaking, review and analysis** including a critical review of *Dominica's Climate Change Adaptation Policy and Action Plan*(2002) (endorsed by Cabinet in 2002) that was developed with support under the *Caribbean Planning for Adaptation to Climate Change* project, and analysis of

current and ongoing national development policies, programs and initiatives in particular the Government of Dominica's *Growth and Social Protection Strategy* (GSPS) which articulates a medium-term strategy for growth and poverty reduction over the next five years and sets priorities to make poverty reduction the principal focus of Government's economic and social policy;

- (b) Broad-based stakeholder **climate change risk assessment** (including prioritization and ranking of climate change risks affecting Dominica) adapted from the risk assessment approach/methodology/guidelines which were developed under the *Adapting to Climate Change in the Caribbean* (ACCC) project and based on climate change trend analysis and projections contained in Dominica's *Initial National Communication* (INC) and *Second National Communication* (SNC) to the UNFCCC;
- (c) Critical review of Dominica's *National Capacity Self Assessment* (NCSA) and an **Adaptive Capacity Assessment** (assessing institutional, systematic, individual capacity) for public and private sector, vulnerable communities/sectors that served to update and validate recommendations contained in the NCSA;
- (d) **Community Surveys** undertaken to identify climate change vulnerabilities, capacities and priority needs that built upon community vulnerability mapping and adaptive capacity assessments, undertaken under Dominica's *Sustainable Land Management* project and *Special Program on Adaptation to Climate Change* (SPACC) project;
- (e) Identification of **priority needs and investment opportunities** to facilitate Dominica's transformation to a climate-resilient development path, that was undertaken during the SPCR National Consultative Workshop;
- (f) **Cost-benefit Analysis** of proposed SPCR investment opportunities that was undertaken with technical support/methodologies provided by the Caribbean Community Climate Change Center (CCCCC) under Phase 1 of the regional track SPCR program.

The **climate change risk assessment** built upon the **Stocktaking** and **Institutional Analysis** undertaken under the *National Capacity Self Assessment* (NCSA) and the vulnerability assessments undertaken to develop Dominica's *Climate Change Adaptation Policy*, *Initial National Communication* and *Second National Communication* (SNC). The climate change risk assessment was modeled on the process outlined in the *Risk Management Guidelines for Climate Change Adaptation Decision Making*¹. Using a multiple criteria analysis, each PPCR Technical Working Group (TWG) undertook a sector specific assessment as follows:

- (a) Identification of **event risks** and **outcomes risks** based on vulnerability assessments contained in Dominica's *Initial National Communication*, *National Climate Change Adaptation Policy*, and *Second National Communication*;
- (b) Ranking of event/outcome risks in terms of **severity of social/ economic/ environmental/ impacts** (11 indicators used for ranking);
- (c) **Probability/frequency analysis** on prioritized event/outcome risks that scored the highest in terms of severity of social/economic/environmental/impact;
- (d) Once each sector TWG had completed the sectoral risk assessment – stakeholders during the National Consultative Workshop verified the outcomes and developed the list of national priority risks based on top ranked risks for each sector.

¹Developed under the "Mainstreaming Adaptation to Climate Change" and "Adapting to Climate Change in the Caribbean" (ACCC) projects funded by GEF/World Bank/CIDA. 2003.

Through this *climate change risk assessment*, national stakeholders identified the following as priority risks from climate change:

Table 1 - SUMMARY OF CLIMATE CHANGE RISKS

Event Risks and Outcome Risks	Ranking of Risks
Increase in extreme events and climate variability (Cumulative Risks) - <i>Physical damage to crops and agricultural access roads, impact on agricultural and fisheries productivity, increase of pests/disease, impact on livelihoods and food security</i>	10
Increase in extreme events -<i>More frequent economic setbacks, prolonged recovery periods, stress on economy (including increase in loss of life, impact on tourism arrivals, impact on agricultural production, food security, forest cover, human health and social capital), and less attractive environment for foreign investment due to cumulative destruction of critical infrastructure for tourism, manufacturing, agriculture, trade</i>	10
Increase in extreme events (increased intensity of hurricanes, flooding, landslides) – <i>Increased damage to houses, human settlements, critical infrastructure, forest resources, business and other properties</i>	10
Sea level rise – combined with increased incidents of storm surges - <i>Damage to coastal infrastructure (roads, ports, jetties, storage, processing, packing, landing sites) used for agricultural trade and access to markets</i>	9
Increased frequency of extreme events -<i>Water shortages due to increased drought and storms</i> (Note: includes loss to crops)	9
Sea level rise – combined with increased incidents of storm surges - <i>Damage to coastal tourism facilities (beaches, hotels, airports, sea ports and cruise ship/ferry terminals)</i> (NOTE: Includes impacts on Kalinago people and lost income to farmers)	8
Sea level rise and storm surge - <i>Loss of coral reefs – loss of protection to coastal areas and impact of marine ecosystem and associated effect on livelihoods and food security</i>	8
Climate variability -<i>Loss and impact on marine and terrestrial biodiversity which is key pillar for tourism</i>	8
Changes in rainfall intensity -<i>Increased coastal marine habitat degradation (including corals) and damage to fisheries infrastructure</i>	8
Increased climate variability -<i>Changes in fish and marine mammal migration patterns affecting food security and tourism</i>	8
Changes in rainfall patterns - <i>Increased incidents of landslides affecting houses, human settlements and infrastructure, and forest resources, in addition to costs for insurance and building loans</i>	8
Increase in extreme events –<i>Damage to coastal property and infrastructure due to storms surges</i>	7

Increase in extreme events -<i>Reduced availability of international donor funding due to increased demand for emergency assistance from vulnerable countries</i>	7
Changes in national and local temperatures regimes -<i>Increased damage to buildings and water cisterns from extreme dry conditions</i>	7
Sea level rise – combined with increased incidents of storm surges - <i>Increased costs for insurance, re-insurance and costs to banks providing loans for coastal infrastructure</i>	6
Increased climate variability - <i>Increased land degradation</i> (variation in temperature) (Note: impact on food production, water quality, health and nutrition)	6
Changes in rainfall patterns - <i>Impact on water quality/supply and costs of water treatment/delivery and damage to water/communication infrastructure</i> (NOTE: hotels and restaurants at tipping point and loss of income due to lack of water could put them out of business)	6
Increased climate variability - <i>Decline in tourism visitor arrivals due to more mild conditions affecting winter tourism market</i>	6
Sea level rise and storm surge- <i>Damage to coastal infrastructure from sea level rise and higher storm surges and associated impact on tourism (hotels, dive industry, yachting)</i> (Note: Significant cultural loss in Carib Territory and loss of beaches for recreation)	6
Increase in extreme events - <i>Increase cost of coastal resources management</i>	6
Increase in extreme events-<i>Damage to water resources/infrastructure and impact on water quality and costs for water supply</i>	6

As part of the SPCR *Adaptive Capacity Assessment*, a *National Adaptive Capacity Assessment* was undertaken to evaluate national adaptation capacity needs/ priorities. This assessment highlighted the fact that Dominica has made considerable progress in implementing *Stage 1* adaptation measures. However, the implementation of *Stage 2* and *Stage 3* measures have not been possible due to serious resource (human, technical, financial) constraints. The PPCR *National Adaptive Capacity Assessment* also identified *considerable limitations in climate change risk management capacity* at the systematic, institutional and individual levels, at the national, sectoral, district and local level, and within the public sector and civil society, highlighting the *need for considerable capacity building*. The *National Adaptive Capacity Assessment* confirmed the need for improved levels of *earmarked financial resources for climate change risk management and resiliency building* as articulated in the NCSA, and the need for *improved coordination* amongst key state and non-state actors involved in climate change risk management.

Additionally, using the household survey piloted under the SLM/SPACC projects, a community survey was undertaken during the SPCR prioritization planning process which served to refine and validate the risks/needs of vulnerable communities as articulated during community vulnerability mapping and adaptation planning undertaken during the SLM/SPACC projects. Building upon earlier analysis undertaken on climate change impacts on gender and other vulnerable segments of society (outlined in Section 9 and the Annex of Dominica’s *Low Carbon Climate Resilient Development Strategy*)the

household and community surveys highlighted *concerns over food security*, the urgent need to provide vulnerable communities with *micro-insurance and micro-finance* to address risks from climate change extreme events (floods, drought, landslides, crop damage, loss of fishery) affecting subsistence agriculture/fishery production, and the urgent need for *community based early warning systems, community-based vulnerability/hazard mapping, community multi-use emergency shelters, and community risk management frameworks*. Improved access to readily available *financing to support priority community-based adaptation projects* was also been highlighted as a priority. These investments are urgently needed to support *transformational change in vulnerable communities whereby households and individuals assume the lead role in building resilient communities rather than relying on overstretched government resources*. Lessons learned from Tropical Storm Erika that devastated Dominica in August 2015 has highlighted the need to implement these priority interventions which, despite US\$20 million being secured under the SPCR program, remains largely unfunded.

By addressing the deficiencies identified during the SPCR priority planning process, SPCR interventions were intended to support *the establishment of an appropriate enabling framework to guide and facilitate Dominica's transformation to a low-carbon climate resilience development pathway that can serve as a model for other small island developing States in the region*. By positioning climate change as a development issue rather than an environmental issue, Dominica's SPCR provides the opportunity to demonstrate viable interventions to address climate change risks within the context of a national development framework that establishes the country firmly on the path to a Green Economy.

SPCR interventions are to be sustained in the long-term by ensuring that climate change planning/management becomes an *integral part of the national development planning process* under Dominica's *Growth and Social Protection Strategy (GSPS)* and *Low Carbon Climate Resilient Development Strategy*, the latter having been formulated during the SPCR planning process. In supporting the *transition from the situation whereby government is solely responsible for climate change risk management to a country where this is a shared responsibility*, SPCR interventions have to opportunity to demonstrate a model for transformation changes that could benefit other developing countries. Sustainability will be achieved by establishing *effective partnerships* with all stakeholders (public sector and civil society, technical and financial partners, local governments, vulnerable communities, grass-roots organizations) to transform Dominica to a low-carbon climate resilient country that will make a significant contribution to sustainable development in the country, and add value by ensuring that the SPCR is not a standalone activity, *but becomes a responsibility assumed by all stakeholders*.

Priorities for Building Climate Resilience

While there are several sectors and issues identified by national stakeholders as being important to address climate change risks in Dominica, there are a few that require priority attention if building of climate resilience is to be achieved. Outlined below are the issues considered by national stakeholders during the SPCR planning process and INDC development process to be a priority for Dominica, that have not yet been funded or implemented, and which possess the greatest potential to contribute to the successful transformation of the country to a climate resilient low carbon development path.

- (a) Addressing climate change *mitigation measures* on the basis that savings in energy costs will allow Dominica to invest more in priority and much needed *adaptation measures*;
- (b) Establishing *community off-grid mini-grid or micro-grid renewable energy electrical supply systems* (backed up by emergency alternative energy systems (such bio-diesel generators, should local conditions allow for the operation to be efficiently established) in vulnerable communities on the east and south east coasts that are periodically without electricity as a consequence of storm and hurricane events;

- (c) Establishing *early warning systems, multi-use disaster shelters (powered by renewable energy and back up bio-diesel generators) and emergency preparedness training programs* in vulnerable communities;
- (d) Facilitating *capacity building* through education, awareness and training programs on climate change risks and resiliency measures in order to strengthen capacity at the community and sectoral level, within municipalities and local authorities, and the private sector;
- (e) *Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development* to build climate resilient communities by strengthening capacity to address climate change risks to food security associated with changing precipitation patterns;
- (f) Establishing the *enabling legal/institutional framework to facilitate coordination/implementation* of priority climate change measures and the mainstreaming of climate change activities into national, sectoral and community planning/development;
- (g) *Creating the supportive enabling framework whereby communities and vulnerable segments of society (women, youth, elderly, people with disabilities) can manage their own climate change risks*, thereby addressing climate change impacts on vulnerable sectors (particularly agriculture, fisheries and water resources) and threats to food security, human health, poverty alleviation, sustainable livelihoods and economic growth;
- (h) Establishing a *sustainable financing mechanism* to ensure timely and direct access to international climate change financing to implement priority climate change risks management measures by the private sector and vulnerable communities;
- (i) Legal establishment of the Department of Climate Change, Environment and Development and the financing of key technical personnel needed to ensure effective and timely implementation and coordination of the SPCR program and other climate resilient programs under Dominica's *Low Carbon Climate Resilient Development Strategy*, and to serve as National Implementing Entity (NIE) to facilitate direct access to and management of international climate change financing under the Green Climate Fund;
- (j) design and implementation of climate change adaptation and disaster risk management education and awareness program at all levels to be coordinated by the Department of Climate Change, Environment and Development;
- (k) legal establishment of *Climate Change Trust Fund* in addition to US\$5 million seed funding to the *Climate Change Trust Fund* to provide support to priority community climate change risks management measures identified through community vulnerability mapping and adaptation planning and the establishment of micro-finance and micro-insurance for private sector and vulnerable segments of society (farmers, fisher-folk, women and vulnerable communities in particular the Kalinago people).

Costs for the abovementioned priority adaptation measures that are to be implemented over the next 5 years are US\$25 million.

Implementation

Implementation of priority climate change programs is a joint responsibility led by the Ministry of Health and Environment. The Council for Environment, Climate Change and Development (CECCD) and the Department of Climate Change, Environment and Development (currently the ECU) that are to be legally established under the proposed *Climate Change, Environment and Development Bill 2015* (which has been developed through broad-based consultation and is to be presented for enactment before the end of 2015) will be responsible for coordinating climate change programming in Dominica. It is proposed that the *Climate Change, Environment and Development Bill* be enacted prior to COP21 meeting in Paris as a demonstration of Government of Dominica's commitment to the establishment of the enabling framework to mainstream climate change into national planning processes. The Department of Climate Change, Environment and Development is to establish and manage the National Climate Change Trust Fund

established under the *Climate Change, Environment and Development Bill 2015*, which together shall serve as the National Implementing Entity (NIE) for climate change programs in Dominica. Dominica will seek assistance under the “Readiness” program operated by the Green Climate Fund to establish the necessary legal, institutional and fiduciary management framework and accredit the Department of Climate Change, Environment and Development as the National Implementing Entity (NIE) to facilitate direct access, thereby reducing dependence upon intermediary agencies for the design and implementation of priority adaptation interventions.

The Department of Climate Change, Environment and Development will report to the CECCD to provide regular reports on the implementation and administration of climate change programming in Dominica. Given the very substantial volume of climate change investments proposed and the additional institutional capacity required to undertake climate change programming, implementation capacity will be closely monitored and assessed periodically throughout implementation. The Government of Dominica is committed to providing the necessary resources to ensure the timely and successful implementation of the *Low-Carbon Climate-Resilient Development Strategy* and compendium SPCR, which have been endorsed by the Hon. Roosevelt Skerrit - Prime Minister and Minister for Finance (letter of endorsement as of 5th April 2012) and approved by Cabinet on Tuesday, 11th April, 2012. However, when proposing its contribution, Dominica recognizes that the country faces its own challenges and its contribution has been assessed in parallel with, and subject to the country priorities in term of poverty alleviation, sustainable economic development and equitable GDP growth. In light of limited resources, the implementation of the climate change program outlined in this INDC is conditional upon receiving timely access to international climate change financing, technology and capacity building support for priority adaptation/mitigation measures.

Equity

In order to ensure the fair and equitable distribution to local communities of benefits from the harnessing of renewable resources to facilitate the transition to a low carbon development pat, the Government of Dominica will establish an appropriate royalty regime for the commercial exploitation of hydro and geothermal resources. To assure fair and equitable compensation for self-generation owners, the Government of Dominica will promote the establishment of a net metering program. This will assist in ensuring fair and equitable payment for excess power delivered to the grid from self-generators.

Dominica continues to suffer considerable economic, social and environmental loss and damage due to impacts from climate change. The sound and sustainable management of forests in Dominica has ensured that GHG emissions generated in the country have been sequestered, thereby making no net contribution to global greenhouse gas levels. As a developing country with limited economic output facing serious challenges to implement long-standing poverty eradication programs, Dominica cannot afford to continue financing the loss and damage resulting from global climate change. Having made no net contribution to global GHG emissions, and making every effort to harness geothermal resources in a manner that will permit the country to export significant amounts of renewable energy, Dominica seeks an equitable transfer of international climate change financing to sustain priority adaptation and mitigation programs that will support green growth, social development and poverty reduction in the country.



REPÚBLICA DOMINICANA

CONTRIBUCIÓN PREVISTA Y DETERMINADA A NIVEL NACIONAL INDC-RD

La visión de la República Dominicana para el año 2030 establece que:

“República Dominicana es un país próspero, donde las personas viven dignamente, apegadas a valores éticos y en el marco de una democracia participativa que garantiza el estado social y democrático de derecho y promueve la equidad, la igualdad de oportunidades, la justicia social que gestiona y aprovecha sus recursos para desarrollarse de forma innovadora, sostenible y territorialmente equilibrada e integrada y se inserta competitivamente en la economía global”.

Para la concretización de esta visión, la Estrategia Nacional de Desarrollo 2030 (END) articula la política pública en varios ejes fundamentales del desarrollo. En esta estrategia se fomenta la transformación de la sociedad a una cultura de producción y consumo sostenible, que gestiona con equidad y eficacia los riesgos, la protección del medio ambiente y los recursos naturales, y promueve una adecuada adaptación al cambio climático. Esto supone un enorme reto dadas las circunstancias nacionales, condiciones territoriales y las características ambientales que se suman y superponen a los desafíos del Cambio Climático.

Por ser un país altamente vulnerable, la República Dominicana aspira al logro de un acuerdo mundial, basado en el consenso científico, que evite el incremento de la temperatura media mundial de 2°C, con reducción progresiva hacia 1.5°C.

La Contribución Prevista y Determinada de la República Dominicana se ha diseñado en base a las capacidades nacionales, condiciones de financiamiento previstas y las circunstancias nacionales.

Nivel de Referencia	El escenario utiliza el 2010 como año base donde las emisiones per cápita estimadas son 3.6 tCO ₂ e.		
Resumen cuantificable de Ambición	Reducción de un 25% de las emisiones del año base para el 2030. Esto condicionado a que el apoyo sea favorable, previsible, se viabilicen los mecanismos de financiamiento climático, y se corrijan las fallas de los mecanismos de mercado existentes.		
Plazos y / o períodos de aplicación	El período de aplicación es 2010-2030, con revisión cada 5 años. Las contribuciones post 2030, serán establecidas al concluir la END.		
Ambito de aplicación y cobertura	<u>Sectores de Emisiones:</u>	<u>Gases de Efecto Invernadero</u>	<u>Cobertura:</u>
	<ul style="list-style-type: none"> - Energía - Procesos Industriales y Uso de Productos - Agricultura - Residuos - Cambio de Uso de Suelo - Silvicultura y Forestal 	<ul style="list-style-type: none"> - Dióxido de carbono (CO₂) - Metano (CH₄) - Oxido nitroso (N₂O). 	A nivel nacional.
Procesos de planificación	Se fundamenta en la END, la Política Nacional de Cambio Climático, el Plan de Desarrollo Económico Compatible con el Cambio Climático (DECCC) y el Plan de Acción Nacional de Adaptación (PANARD). Estos instrumentos articulan la política pública en torno a ejes estratégicos, donde se han establecido indicadores para la descarbonización de la economía y de la sociedad, y aspectos relevantes para una efectiva adaptación al cambio climático. Además, en consultas multisectoriales se han identificado acciones específicas para la adaptación y la mitigación.		
Enfoques metodológicos y supuestos	<p>La metodología para el cálculo corresponde a las “Directrices del IPCC para la realización de los Inventarios Nacionales de Gases de Efecto Invernadero del 2006”; asumiendo los valores de los Potenciales de Calentamiento Global (GWP, por sus siglas en inglés) del Segundo Informe del IPCC para un período de residencia en la atmósfera de 100 años.</p> <p>Tal y como se indica en la END en lo referente a la inserción competitiva del país en una economía global, se plantea la potencial participación en los mecanismos de mercado de carbono. El desarrollo del mercado de carbono debe garantizar la integridad ambiental tanto a nivel nacional como internacional.</p> <p>El Uso del Suelo y Cambio de Uso de Suelo tienen implicaciones en términos de emisiones y absorciones, cuya cuantificación será usada para lograr los objetivos propuestos dentro de la contribución nacional.</p>		
Nivel de ambición	<p>El nivel propuesto es Ambicioso. La República Dominicana es un país de ingreso medio, sin embargo, tiene que hacer frente a una serie de desafíos al desarrollo, como son: la pobreza, educación, salud, seguridad, entre otros, que se superponen al desafío de la adaptación y al desacoplamiento de las emisiones de la economía.</p> <p>En términos de emisiones, la República Dominicana representa menos del 0.1% de las emisiones mundiales. Las emisiones per cápita están por debajo de la media de Latinoamérica y El Caribe (4.9 tCO₂e), sin embargo, la tendencia de las emisiones de algunos sectores económicos son importantes, en especial, transporte, energía, manufactura y construcción, residuos y agropecuaria.</p>		
Adaptación	En la República Dominicana la adaptación es una prioridad constitucional. Los sectores identificados como más vulnerables son: Agua para Consumo Humano, Energía (componente de generación		

eléctrica), Sistema Nacional de Áreas Protegidas, Asentamientos Humanos y Turismo.

Los bloques de planificación para el abordaje estratégico de la adaptación serán los siguientes:

- Adaptación Basada en Ecosistemas/Resiliencia Ecosistémica
- Incremento de la Capacidad Adaptativa y Disminución de Vulnerabilidad Territorial/Sectorial
- Manejo Integrado del Agua
- Salud
- Seguridad Alimentaria
- Infraestructura
- Inundaciones y Sequías
- Costero-marino
- Gestión de Riesgos y Sistemas de Alerta Temprana

Pérdidas y Daños

La República Dominicana por su condición de pequeño estado insular en desarrollo, y por encontrarse situado en una zona de intensa actividad ciclónica, se encuentra amenazada constantemente por eventos hidrometeorológicos como ondas tropicales, sequías, tormentas y huracanes, afectando asentamientos humanos y actividades productivas.

Los daños asociados a las actividades hidrometeorológicas en el curso de los años, han dejado una secuela de efectos cuya superación ha exigido esfuerzos importantes. El Huracán Georges del 1998, representó en términos de pérdidas y daños el equivalente al 14% del Producto Interno Bruto (PIB) del 1997. Las tormentas tropicales Olga y Noel en el 2007 obligaron a replanificar la economía y las prioridades del gobierno, cuya sumatoria de daños y pérdidas significaron el 1.2% del PIB y el 5.3% del presupuesto nacional. De igual manera, han ocurrido una secuela de desastres vinculados a inundaciones, deslizamientos de tierras y sequías que no han sido cuantificados.

El impacto de algunos eventos extremos han significado pérdidas económicas por el orden de USD 9,470 MM y los sectores más afectados han sido: agricultura, vialidad, energía, vivienda, educación, industria y comercio, saneamiento, drenajes, salud y medio ambiente. Estas estadísticas se refieren a eventos mayores que causan desastres, pero los eventos menores y recurrentes pueden causar grandes daños a bienes, medios de vida y cultivos. Sin embargo, persisten ciertas deficiencias en el registro histórico de eventos medianos y pequeños, y se estima que equivalen a la mitad de las pérdidas y daños de los eventos mayores.

Financiamiento

Para el sector Agua, el costo incremental de la adaptación con referencia a un escenario tendencial para el período 2010-2030, alcanza un monto de USD 2,792.5 MM (Dólares del 2005), que representan en promedio el 0.48% del PIB proyectado para ese período. En el sector Turismo, que en los próximos años tendrá que enfrentar las consecuencias de fenómenos hidrometeorológicos, se ha estimado que los flujos financieros incrementales ascienden a un monto de USD 358.3 MM (Dólares del 2005) para el período 2005-2030.

En términos de mitigación, la implementación del DECCC tiene implicaciones de costos aproximados de USD 17,000 MM (Dólares del 2010) en los sectores energía, transporte, forestal, turismo, residuos sólidos y cemento para el período 2010 – 2030; para alcanzar reducciones de emisiones por el orden de 25 MtCO_{2e}. Estos costos son los asociados a las medidas identificadas con potencial de mitigación, no de medidas estructurales para modificar o propiciar un ambiente habilitante en los sectores.

La Estrategia Nacional para Fortalecer los Recursos Humanos y las Habilidades para Avanzar hacia un Desarrollo Verde, con Bajas Emisiones y Resiliencia Climática identifica que las necesidades de financiamiento superarán los USD 1.5 MM anuales para proyectos de Educación Superior, Técnico-Vocacional y Especializaciones.

Necesidades

Se ha desarrollado una Evaluación de Necesidades Tecnológicas (ENT) en el país, donde se han

Tecnológicas	identificado una serie de medidas y tecnologías cuya implementación es compatible con la END, DECC y el PANA-RD.
Construcción de Capacidades y Juventud	Entendiendo el desafío que representa, en términos de desarrollo, una sociedad baja en emisiones y resiliente, la República Dominicana ha desarrollado una estrategia para el fortalecimiento de los recursos humanos, con énfasis en los más jóvenes y las futuras generaciones, articulada con la END. A la fecha ya se ha iniciado con la formación de multiplicadores (120) y docentes (1,200), con mediciones del impacto de la eficacia de la estrategia.
Género	Conscientes que, los efectos del cambio climático impactan de forma diferenciada a los grupos humanos vulnerables, la perspectiva de género es un aspecto transversal al modelo de desarrollo nacional. Por tanto, se reconoce el rol de la mujer como agente de cambio, y se fomenta su participación para la transformación de la sociedad hacia un desarrollo bajo en carbono y resiliente.



Ecuador's Intended Nationally Determined Contribution (INDC)¹

I. Background

Climate Change is one of the greatest challenges faced by humankind and represents an irreversible threat to societies and the planet as a whole. This is why urgent global action is required to address its effects. It remains clear to Ecuador that the urgency of this phenomenon requires the widest global cooperation, in line with the norms, objective and principles of the United Nations Framework Convention on Climate Change (UNFCCC) and, in particular, the principle of common but differentiated responsibilities and respective capabilities as well as the continuous and sustained implementation of the commitments derived from the Convention.

However, since the adoption of the Convention in 1992, there have been gaps in its implementation, which is why COP17 in Durban initiated a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties. This new instrument needs to enhance action for the full, effective and sustained implementation of the Convention both pre and post 2020.

The current document responds to the invitation extended by 1/CP.19 to initiate or intensify domestic preparations for their Intended Nationally Determined Contributions (INDCs), without prejudice to the legal nature of the contributions, in the context of adopting a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties towards achieving the objective of the Convention as set out in its Article 2 and to communicate them well in advance of the twenty-first session of the Conference of

¹ Unofficial translation. For the official language, please refer to Ecuador's INDC in Spanish.



the Parties (by the first quarter of 2015 by those Parties ready to do so) in a manner that facilitates the clarity, transparency and understanding of the intended contributions, without prejudice to the legal nature of the contributions.

In the process related to short, mid and long-term planning to greenhouse gas reduction, Ecuador takes the following legal instruments into account:

- The National Constitution of Ecuador from 2008
- The National Plan of Good Living (*Plan Nacional para el Buen Vivir*) 2013-2017 that contextualizes climate change as a multi-sectorial problem at the national level that needs to be addressed through programmatic measures that generate results at the mid and short-term.
- The National Climate Change Strategy 2012-2025 that was formulated under a logic of adaptation and mitigation results.
- The National Climate Change Plan 2015-2018.
- The national legal framework to protect and preserve wildlife areas representative of the country's ecosystems, the establishment of the National Heritage of Protected Areas and the Government's responsibility to manage, supervise and preserve native flora and fauna in the country.

Ecuador is a signatory to the United Nations Framework Convention on Climate Change and forms part of the Non-Annex I group of countries, which is why it does not have mandatory commitments for greenhouse gas reductions. Nonetheless, aware of the adverse effects of climate change and in strict respect to the national policies, Ecuador has implemented a variety of mitigation and adaptation policies at the national level that aims to implement the national development model and are based on Good Living (*Buen Vivir*) or "Sumak Kawsay". This model commits the country to defend the right of its population to live in a healthy environment and respect the rights of nature.

Good Living is a new societal paradigm that places human beings and nature above capital and proposes to relocate the center of our motivations, based on a principle that economic growth in a planet with limited resources cannot be boundless.



Good Living means to live with dignity and have basic necessities met in harmony with oneself, with the rest of the community, with different cultures and with nature. It was under this premise that Ecuador established, by referendum, a new constitution in 2008 in Montecristi, which has been without a doubt a crucial step to addressing national and global issues. Our Constitution determined that the National Development Regime is established under the framework of an economic system that “recognizes human being as subject and an end; promoting a dynamic and balanced relation between society, State and market, in harmony with nature; and has the objective of guaranteeing production and reproduction of the material and immaterial conditions that will enable Good Living” (art. 283). This new vision references sustainable and harmonious management of nature with consideration to its limits and regeneration cycles.

In this context, Ecuador establishes itself as the first country worldwide to recognize the rights of nature in its 2008 Constitution through Articles 71-74. These articles determine that Nature, or “Pacha Mama”, where life transpires and is reproduced, has the right to integral respect for its existence, maintenance and regeneration of its life cycles, structure, functions and evolutionary processes; and that it has the right to restoration, apart from the obligation of the State and natural persons or legal entities to compensate individuals and communities that depend on affected natural systems.

In the same framework, Article 414 of the Constitution establishes the following: “The State shall adopt adequate and cross-cutting measures for the mitigation of climate change, by limiting greenhouse gas emissions, deforestation, and air pollution; it shall take measures for the conservation of the forests and vegetation; and it shall protect the population at risk.”

This transformation in the national regulatory framework is reflected in public policy through the National Plan of Good Living 2013-2017 (PNBV for its abbreviation in Spanish) as its guiding pillar. It focuses planning in search of the integral development of the country at the sectorial and territorial levels. Under



this policy, Ecuador has established the following climate change relevant objectives:

Objective 7: To guarantee the rights of nature and promote environmental, sustainability globally.

7.6: To manage water heritage sustainably and taking into account participation of people, using a watershed and ecological flow approach to ensure the human right to water.

7.7 To manage water heritage sustainably and taking into account participation of people, using a watershed and ecological flow approach to ensure the human right to water.

7.8 To prevent, control and mitigate environmental pollution in extraction, production, consumption and post- consumption.

7.9 To promote conscious, sustainable, efficient consumption patterns with a criterion of sufficiency within the planet's limits.

7.10 To implement climate change mitigation and adaptation measures to reduce economic and environmental vulnerability with emphasis on priority groups.

Objective 11: To ensure the sovereignty and efficiency of strategic sectors for industrial and technological transformation.

11.1 To restructure the energy matrix under criteria of transforming the productive structure, inclusion, quality, energy sovereignty and sustainability, increasing the share of renewable energy.

11.4 To manage water resources, under a constitutional framework of sustainable, participatory management of watersheds and marine spaces.

The restructuring of the energy matrix envisioned in the PNBV 2013-2017 establishes that the exploitation of the potential energy needs to be based on renewable sources, mainly derived from hydro-engineering, as well as incentives for the efficient use and saving of energy through the employment of efficient technologies.



Additionally, Ecuador has defined its National Climate Change Strategy 2012-2025 (ENCC for its abbreviation in Spanish) that establishes the strategic and institutional bases for the generation of national climate change plans in prioritized sectors for mitigation and adaptation and aims at building capacities. In this regard, it is important to highlight that climate change adaptation and mitigation have been declared State policies since 2009 via Executive Decree 1815 and through the Interinstitutional Committee on Climate Change (CICC for its abbreviation in Spanish) established in 2010, via Executive Decree 495, as the governmental organ for the coordination and integral execution of national policies related to climate change.

At present, Ecuador is working on the development of the National Climate Change Plan, with the main objective of streamlining and institutionalizing climate change into the different activities that sectorial agendas have, as well as into the national objectives of restructuring the national energy and productive matrix.

According to the national greenhouse gas (GHG) inventory for the Intergovernmental Panel on Climate Change (IPCC) sectors, Ecuador's emissions in 2010 were 71.8 million t/CO₂eq. These numbers are relatively low when compared to global emissions of 49 billion t/CO₂eq, making Ecuador's emissions approximately 0.15% of the world's emissions. Out of this total, the Energy (50%) and AFOLU (43%) (Agriculture, Forestry and other Land Uses) sectors are the largest contributors to the country's emissions.

Under this national context, despite being a developing country with relatively low emissions in comparison with the world, Ecuador recognizes the importance of implementing climate change mitigation and adaptation mechanisms and actions. In that sense, it highlights that the implementation of climate change actions requires the integration of climate considerations in planning and development processes at a national level.



With this background information, Ecuador hereby presents its Intended Nationally Determined Contribution (INDC), reserving the right to make adjustments based on an assessment of national or international circumstances.

II. Enhanced Climate Change Actions

It remains clear for Ecuador that in order to guarantee the reaching the Ultimate Objective of the UNFCCC of achieving the stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, the participation of all countries in line with their capabilities and responsibilities is crucial.

In striving to reach the objective of keeping the global temperature rise below 1.5 or 2 degrees Celsius in comparison to preindustrial levels, Ecuador has initiated a process of decarbonizing its energy and productive matrices under which mitigation and adaptation actions are developed.

Emission reduction projections have been carried out through the LEAP (Long-range Energy Alternatives Planning Systems) software, taking into account population and GDP projected growth and establishing a Business as Usual (BAU) scenario, which constitutes the baseline of the emission reductions expected by Ecuador's policies. This BAU scenario makes projections and comprises the period between 2011 and 2025.

Based on these calculations, Ecuador aims to reach a 90% of clean energy coming from hydroelectric plants in its total electricity production in 2017 and raise the proportion of renewable energy in the energy matrix even more until 2025. (PNBV 2009-2013)

Ecuador intends to reduce its emissions in the **energy sector in 20.4-25%** below the BAU scenario. However, a potential for reducing emissions even further in the



energy sector, to a level between 37.5 and 45.8% with respect to the BAU baseline has also been calculated. This potential could be harnessed in light of the appropriate circumstances in terms of availability of resources and support offered by the international community. This is a second scenario dependent upon international support and will translate into a per capita emissions reduction in 2025 of **40%** below the BAU levels.

These results will be derived from a series of policies, including:

- The incorporation of 1,500,000 induction stoves in the first scenario and 4,300,000 in the second scenario.
- The electric generation from the gas associated to oil exploitation at different capacity levels by optimizing its use. With the use of these gases, electricity will be generated and transmitted to the Amazon region for the use in oil industry, water pumping and camps and communities in the covered areas, replacing the traditional use of diesel for these ends. A second phase of this program focuses on linking this energy to the national interconnected system.
- The introduction of an installed capacity of electric generation from hydroelectric plants of **2,828 MW** additional to the BAU in the first scenario and an extra **4,382 MW** in the second, dependent upon international circumstances. Adaptation measures in the energy sector will contribute to the implementation of electric infrastructure strategies that address extreme climate change events attributed to climate variability. Analysis will be made for hydroelectric projects related to the vulnerability of their water systems.

Additionally, Ecuador is aware of the impact that activities in the **forestry sector** and appropriate **management of protected areas** have on climate change. With this in mind, Ecuador planned on improving the work in both fronts and established objectives and concrete goals. The National Protected Areas System



(SNAP for its acronym in Spanish) covers approximately 20% of Ecuador's surface. This is why gross reforestation has been reduced by 24.65% from 1999 levels and annual regeneration has improved by 35.5%. The total surface under conservation has increased 232% since 2010 thanks to the conservation incentives offered through the Socio Bosque Program.

These policies and programs have been translated into forward looking objectives. Through the National Forestry Restoration Program, Ecuador plans to restore 500,000 additional hectares until 2017 and increase this total by 100,000 hectares per year until 2025, counteracting deforestation in the country, contributing to the recuperation of the forest cover and combatting climate change.

Ecuador is committed to reforestation and forest restoration measures. In May of 2015, the country established a new Guinness World Record on reforestation, planting over 2,200 hectares in a period of 8 hours with over 57,000 trained volunteers.

The sustainability of these actions, especially for the period comprised between 2017 and 2025 depends on international financial support. Additional funding will allow for larger coverage of conservation areas and a broader implementation of the Socio Bosque Program to keep the national objective of adding an additional 2 million hectares in 2017.

This emission reduction in comparison to the BAU scenario would have a national coverage; would address carbon dioxide, methane, nitrogen dioxide, carbon monoxide, particulate matter, nitrogen oxide and sulfur dioxide; it would use warming potentials from the Fifth Assessment Report of the IPCC and cover the subsectors of residential, transport, electricity generation in the oil sector and electric generation for the National Interconnected System emissions.



In addition to these actions, Ecuador has implemented and plans to continue implementing important projects and programs with sustainable development and climate change benefits, including the following:

- The Trans-amazon Electric Train (El Tren Eléctrico Transamazónico)
- Eolic projects in San Cristobal and Villonaco
- The Project for the massive replacement of incandescent light bulbs for CFL light bulbs
- The Change of the Energy Matrix of Ecuador

Ecuador has also implemented and will continue to implement several measures to respond and adapt to climate change effects in all its regions. These actions include the following:

- Measures for the effective management of water in communities where the availability or quality of this resource has been affected by climate change.
- The establishment of weather stations in high-altitude mountain locations.
- Conservation of protected areas, management of carbon stocks and establishment of water recollection systems.
- Strengthening the resiliency of vulnerable communities with a focus on food security.
- Identification of areas vulnerable to draught and land degradation in order to promote sustainable land management practices and water catchment systems.
- Analysis of the vulnerability of infrastructure and water availability in hydroelectric plants with respect to the effects of climate change.

It needs to be highlighted that Ecuador has been particularly vulnerable to extreme weather events like the “El Niño” phenomenon from 1998 and 1999 that generated losses of around 2,896.3 million dollars. Out of these losses, 783 million (27%) were related to direct damages and 2,086.1 million (73%) to indirect damages in



productive sectors and infrastructure². According to Jiménez³, it is estimated that an increase in temperature would also imply grave losses for the agriculture sector in crops like corn, beans, potatoes, rice and other. In the coastal region, floods affected rice crops (24% in the Guayas province, 23% in the Los Rios province), corn and sugarcane. In general, around 80,000 hectares of rice were lost, which represents 19% of the cultivated surface nation-wide.

Some specific regions in the coast (El Oro, Guayas, Santa Elena and Manabí provinces)⁴ and in the Andean region (Azuay, Loja and Chimborazo provinces)⁵ have already experienced human and infrastructure losses due to hydrometeorological phenomena aggravated by climate change. On one side, in the Coastal region, annual precipitation has increased by 33% and on the other, in the Andean region, glacier retreat has been exacerbated by 20 to 30% in the last 30 years.⁶

Due to these circumstances, Ecuador is in the process of formulating the National Climate Change Plan (PNCC) for 2015-2018 that will serve as an instrument to operationalize the National Climate Change Strategy, which works with a sectorial approach, streamlining adaptation and mitigation actions on the basis of the prioritization of key identified sectors.

As such, the PNCC 2015-2018 prioritizes the following sectors: agriculture and other land uses, water, ecosystems, energy, risk management and capacity building.

In the **agriculture and other land uses sector**, the main contributions until 2025 include the following: the application of actions to reduce the vulnerability of the impacts of draughts, floods, frosts and other climate change impacts in local

² Comisión Económica para América Latina y el Caribe (CEPAL). La economía del cambio climático en América Latina y el Caribe. Síntesis 2010. UN. 2010

³ Jiménez, S. Impacto del cambio climático en la agricultura de subsistencia en el Ecuador. Serie Avances de Investigación n°66 de la Fundación Carolina. 2012.

⁴ Ministerio del Ambiente, Segunda Comunicación Nacional, pg. 190

⁵ Cervantes, J. Escenarios de cambio climático en el Ecuador. NEWVI.SA. 2009.

⁶ Secretaría Nacional de Planificación, Plan Nacional de Desarrollo 2007 – 2010, pg. 145



planning with regards to the livestock sector in areas with a higher recurrence of these phenomena; measures including the application of silvopasture systems; the incorporation of climate change adaptation systems in the zoning of rural areas; the creation of germoplasm banks, the use of species that contribute to decreasing erosion; diversification of species more resistant to climate change; among others.

Another contribution will include the diffusion of technology and knowledge in the agriculture and livestock sector at the local level, as a tool for improving lifestyle and diversification of production. These technologies and knowledge will aid in including variables related to climate change adaptation and generate information on the potential impacts of climate change on the basic basket. Finally, in this sector, technologies that allow for further agricultural diversification and livestock production, as well as response capacity to the impacts of climate change will be identified, disaggregated, adapted and assimilated.

In the **water sector**, capacity building activities will be organized to face extreme climate events related to climate change through the design of multipurpose and decanting projects to guarantee availability of water for different uses. The linkages between planning and territorial regulation of water resources will be strengthened and the regulation, preservation, conservation, saving and sustainable use of water will be promoted as a response to the impact of climate change on water systems at all levels. Measures will be implemented to maintain water cycles and guarantee the availability required by societies and ecosystems

In the **ecosystem sector**, actions implemented will focus on maintaining these areas and implementing further analyses regarding the need to increase them based on ecosystem dynamics and the potential distribution of species based on climate change scenarios. This will foster biologic terrestrial and marine and coastal biodiversity conservation. Furthermore, climate change criterion will be incorporated and implemented in the management plans for protected areas as well as in studies on the dynamics of terrestrial and marine and coastal



ecosystems, their population and their relations with fulfilling human necessities, particularly in light of possible climate change scenarios.

In the **risk management** sector, efforts will focus on implementing territorial zoning of the susceptibility and risk to mass movements nation-wide will be carried out, and include possible climate change scenarios. Adaptation criteria will be identified and implemented with regards to tourist, energy, road, water and industrial infrastructure to foster financial and technological investment for development and to implement adaptation strategies to reduce physical, social and environmental vulnerability at the national level.

With regards to **capacity building**, plans will be developed at different levels of the state to design and implement concrete actions at the local level.

Ecuador recognizes that several **adaptation activities** will be beneficial to enhancing efforts on mitigation. For instance, the protection of water basins will not only avoid landslides and erosion processes related to torrential rain but will also preserve agriculture and livestock production, water availability for human consumption and ecologic water flows that work as a driving engine of numerous hydroelectric plants. Other measures like the increase of carbon stocks through forest restoration and ecosystem conservation will also have a positive impact to mitigation measures.

Furthermore, Ecuador's ecosystems show high levels of vulnerability to climate change. This is due, apart from the aforementioned effects derived from water resource impacts, to the need to consider the fragmentation of habitats and the degradation to which natural areas are exposed which increases exposure to the impacts of climate change in this sector and upsurges vulnerability levels. Moreover, ecosystems are a source of environmental goods and services like the protection of lands, water regulation and carbon capture and have clear benefits to the Ecuadorian society, strengthening its climate resilience. These goods and services can be altered by the effects of climate change and their state of



conservation as well as their ecologic stability will determine their capacity to resist climate alterations. This way, ecosystem and forest protection as well as the strengthening of the national protected areas systems play a crucial role for the combat of climate change.

These actions stress the level of national planning with regards to climate change and highlight the ambition that Ecuador has to address this phenomenon despite its marginal participation in global emissions. Nonetheless, this ambition is linked to financial needs that would allow the country to increase the understanding of long-term climate change impacts (such as precipitation and temperature increase) and the corresponding socioeconomic implication throughout different sectors nationwide.

Lastly, Ecuador recognizes that the monitoring and evaluation of adaptation policies and programs is crucial to guarantee that resources are aimed at actions that offer the best opportunities to enhance the resilience of our population. Nonetheless, Ecuador does not yet have an MRV system for adaptation related issues. In 2013, the first manual with monitoring indicators, was published, *Climate Change Adaptation Capacity Building en Ecuador*⁷, as a first information gathering on the available tools through which the country can evaluate adaptation projects.

In order to fulfill these **adaptation objectives**, the goal is to strengthen adaptive capacity in at least 50% of the most vulnerable cantons of the national territory, establish early warning systems and risk management at all the levels of the government and reach a zero rate of deforestation. These proposed adaptation activities promote positive synergies with mitigation actions.

⁷ MAE y JICA, *Climate change adaptation capacity building in Ecuador*, ERM, 2013



República de Guinea Ecuatorial

MINISTERIO DE PESCA Y MEDIO AMBIENTE

**CONTRIBUCIONES PREVISTAS Y DETERMINADAS
A NIVEL NACIONAL (CONTRIBUCIONES
NACIONALES)
(CPDN)**

Malabo, Septiembre de 2015

1. INTRODUCCIÓN

Una de las exigencias de la decimonovena Conferencia de las Partes (CoP-19) de la Convención Marco de las Naciones Unidas sobre Cambio Climático (CMNUCC), celebrada en la ciudad de Varsovia (Polonia) en el año 2013, fue invitar a los países Partes a realizar esfuerzos por iniciar e intensificar los preparativos para la elaboración de las llamadas Contribuciones Previstas y Determinadas a Nivel Nacional (CPDN o INDCs en inglés por sus siglas). Con el único propósito de lograr un compromiso mundial que tiende a reducir al máximo las emisiones de Gases de Efecto Invernadero (GEI), en un acuerdo mundial vinculante.

La convención ha considerado el año 2015 como clave en las negociaciones y de mucha expectativa para el futuro de la Madre Tierra, dependiendo del Acuerdo que se adopte sobre el Cambio Climático Global; la Convención Marco de las Naciones Unidas sobre Cambio Climático, tiene el mandato de la COP17, celebrada en Durban (Sudáfrica) para aprobar en la COP21 de París un **Acuerdo Vinculante**, aquello fue el tema prioritario de la COP20, celebrada en Lima (Perú), en diciembre de 2014, adoptando así la decisión 1/COP20. Como un indicador del apoyo políticos de las partes, se ha tomado una iniciativa de ejecución de las CPDN, teniendo como prioridad su alcance, definición, obligatoriedad así como su transparencia.

Para garantizar la aplicabilidad de lo expuesto, la mayoría de los países Partes de la Convención están dispuestos a participar en la lucha común contra el cambio climático. En efecto, se ha determinado que las Contribuciones sean presentadas a la Secretaría de la Convención a más tardar el 1º de octubre del año 2015, para su consideración en la elaboración del Acuerdo Final. Razón por la cual, la República de Guinea Ecuatorial como Parte de la Convención ha tenido a bien elaborar y presentar esta Contribución; la misma refleja la realidad del país y justifica la voluntad política del Gobierno para luchar contra los efectos del cambio climático.

- **Objetivo de la Contribución**

Establecer los mecanismos para la reducción de las emisiones de Gases de Efecto Invernadero (GEI) a largo plazo; situar la progresión de los países en la lucha contra cambios climáticos en el período 2030-2050 en coherencia con la trayectoria post 2050, con el propósito de contener el aumento del Calentamiento Global por debajo de 2°C en relación al periodo preindustrial.

La Contribución de la República de Guinea Ecuatorial ha sido elaborada bajo la supervisión del Ministerio de Pesca y Medio Ambiente, a través de la Dirección General de Medio Ambiente a través del con la colaboración de: Grupo de Expertos de la Coordinación Nacional de Cambios Climáticos y la Asistencia Técnica Internacional. Los datos recogidos en la documentación son de origen nacional e internacional, con un enfoque participativo de actores clave como: los Representantes de Ministerios Sectoriales, sociedad civil, Organización de la Sociedad Civil, el Sector Privado, Cooperación Bilateral y Multilateral.

Por su carácter, las contribuciones previstas y determinadas a nivel nacional en la República de Guinea Ecuatorial se articulan en dos ejes temáticos principales:

- I. La Adaptación al cambio climático, como país vulnerable; incluyendo:
 - a. Integración del cambio climático y problemas de variabilidad climática en las políticas y los procesos de planificación a nivel nacional, regional y local;
 - b. Implementación de estrategias para la reducción de riesgos y medidas de adaptación en sitios piloto;
 - c. Fortalecer la capacidad técnica para integrar los riesgos climáticos en la gestión de las zonas costeras, y
 - d. Difundir lecciones aprendidas a los actores clave

- II. La atenuación de emisiones de Gases de Efecto Invernadero (GEI) a la atmósfera, teniendo en cuenta los sectores más influyentes en el impacto climático nacional:
 - a. Sector Silvicultura, Agricultura y Cambio de Uso de Suelos
 - b. Sector Residuos
 - c. Sector Energía
 - d. Sector Transporte

Para ello, es indispensable garantizar una financiación tanto nacional como internacional, para así hacer frente a las necesidades identificadas.

2. CONTEXTO DEL PAÍS.

Situada cerca de la línea del ecuador en el Golfo de Guinea, la República de Guinea Ecuatorial; limita al Norte con la República del Camerún, al Sur y al Este con Gabón y al Oeste con el Océano Atlántico Ecuatorial, Comparte las fronteras marítimas con Nigeria, Sao Tomé y Príncipe, Gabón y Camerún (*Figura 1*). El país está comprendido por dos regiones: La región insular y la región continental que comprende gran parte de la superficie del país; la otra parte insular que comprende las islas de Bioko, Annobón situada en el Hemisferio Sur, así como los islotes de Corisco, Elobey Grande, Elobey Chico y Mbañe. Tiene una extensión superficial total de 28.051,46 km².

El País dispone de una Zona Económica Exclusiva (superficie marítima) de 314.000 km², 11 veces superior a la superficie de la tierra firme; con 600 km de costa marítima, la cual por lo general es accidentada, sobresaliendo algunas Bahías y cabos.

El clima de Guinea Ecuatorial es de “selva tropical lluviosa” según Köppen, con rasgos de “sabana tropical” en su extremo más oriental. Las condiciones geográficas que modifican de forma significativa el clima del territorio en su parte continental (*Río Muni*) son la existencia de la costa y el relieve de la porción sur, principalmente en la parte sudeste donde se encuentra situado el Monte Mitra (1200 m). La población de Guinea Ecuatorial es de 1.014.999 habitantes, siendo más

de 70% la población vive en el área rural y la economía reposa en gran medida sobre la extracción del petróleo y el gas licuado, así como la exportación de madera, cacao y café.



Ilustración 1.-Mapa de Guinea Ecuatorial

3. PERFIL DEL PAÍS EN EL CONTEXTO DE CAMBIO CLIMATICO

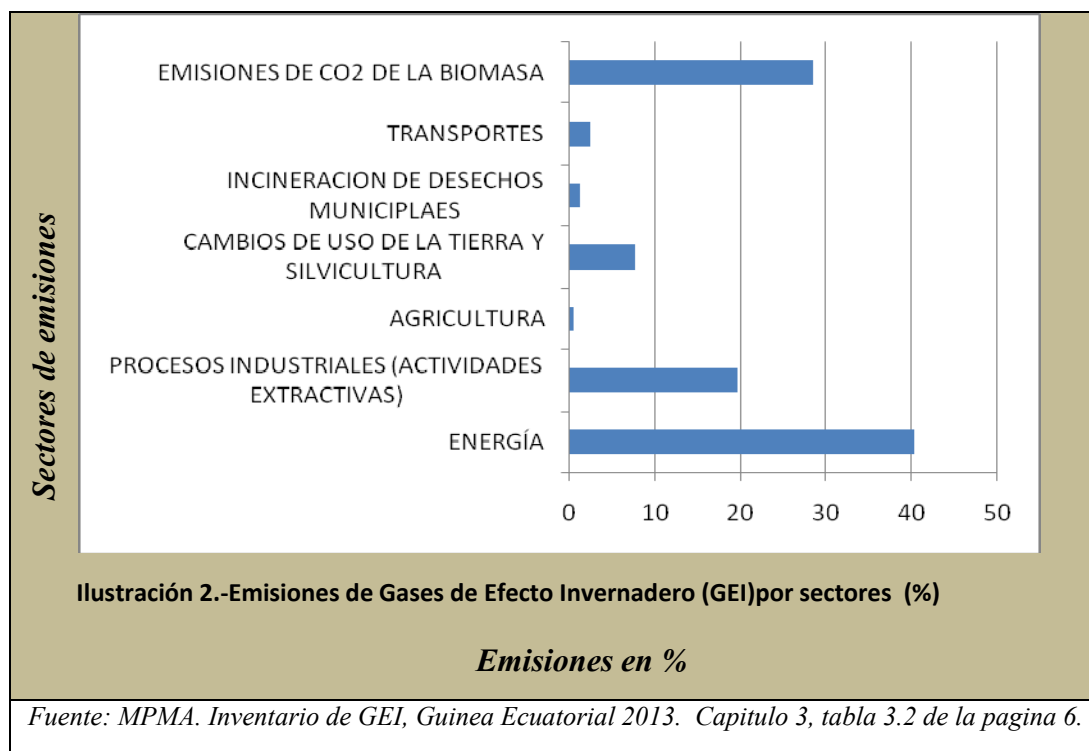
3.1. Las emisiones de Dióxido de Carbono (CO₂)

Cabe resaltar que, en el contexto mundial, el aumento de las emisiones de CO₂ se aceleró después del año 2000, incrementándose en un 35% entre 2000 y 2011, comparado con el 10% del aumento registrado entre 1990 y 2000. Esto se debió principalmente al rápido aumento de las emisiones en las regiones en desarrollo. Además, en las regiones desarrolladas, el promedio de emisiones de CO₂ per cápita ha sido considerablemente más alto que en las regiones en desarrollo (Banco Mundial, 2011). [ver: Banco Mundial. Atlas mundial de datos (2000-2010). Disponible en la página: <http://data.worldbank.org/data-catalog/world-development-indicators>.]

A pesar de las tendencias mundiales, sin embargo, en Guinea Ecuatorial, hubo una reducción considerable ya sean vistas en cantidades totales per cápita como por cada dólar del PIB. Es de constatar que, de los niveles de 10,6 toneladas métricas per cápita en 2003, logró reducir las emisiones hasta los niveles de 6,7 toneladas métricas per cápita en 2010 por la reducción de la tala de arboles y entre otras medidas (Banco Mundial, 2011) [Ibit].

3.2. Categorías y Fuentes

Para la planificación del Inventario de Gases de Efecto Invernadero en la República de Guinea Ecuatorial, algunos sectores fueron seleccionados en base al nivel de sus emisiones.



3.3. Emisiones Agregadas en Equivalentes de CO₂ (CO₂eq)

La poca importancia que tienen las emisiones de CO₂ por los bosques en el país hace que cuando en el análisis se incorporan las emisiones y remociones del sector Cambio de Uso de la Tierra y Silvicultura, las emisiones netas del país se reducen muy poco en comparación con las emisiones brutas.

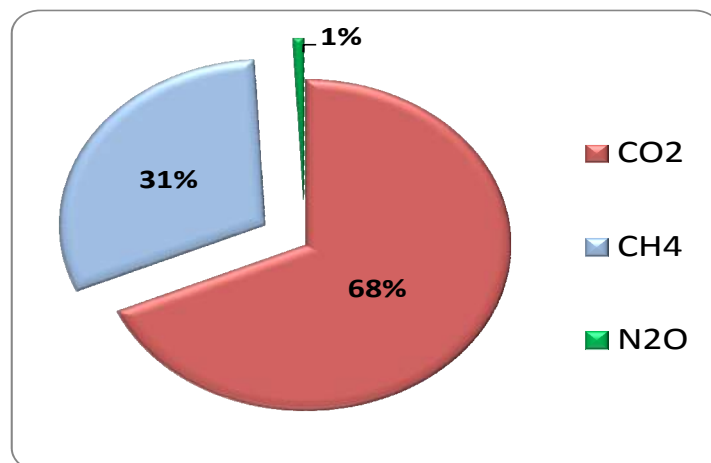


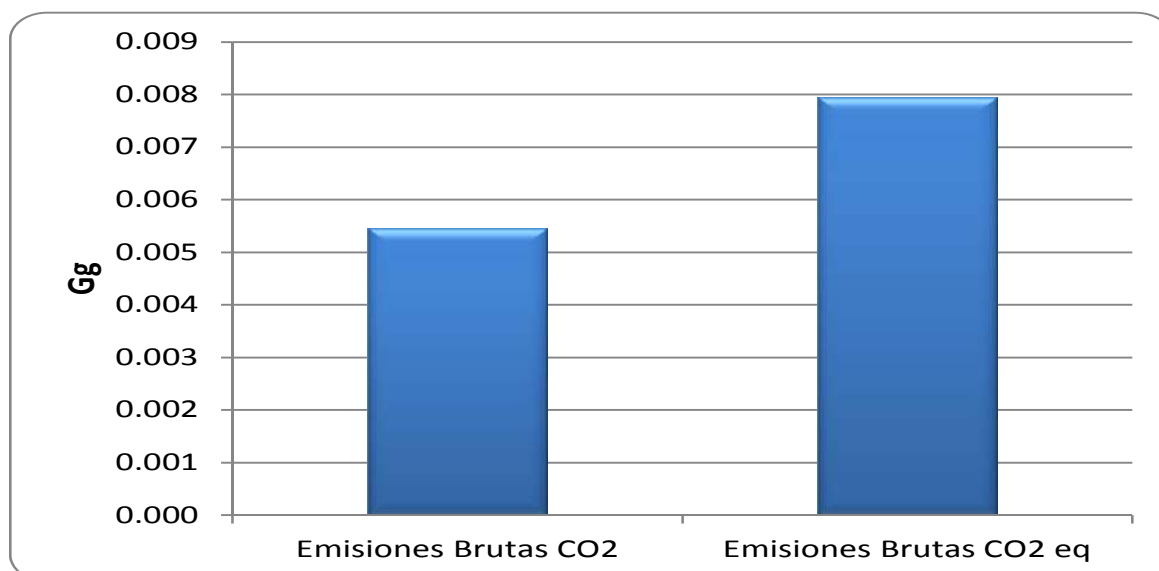
Ilustración 3.-Emisiones de CO₂ eq (Gg) por GEI. Guinea Ecuatorial,2013.

Como puede apreciarse en la ilustración 3, en las emisiones de CO₂eq, el Dióxido de Carbono (CO₂) y el Metano (CH₄) tienen el mayor aporte al calentamiento, mientras que los aportes de Óxido Nitroso (N₂O) son prácticamente despreciables en el país con solo un 1 % de las emisiones.

3.4 Emisiones per cápita de CO₂ y otros GEI en equivalencia de CO₂

En la ilustración 4 se muestran los resultados obtenidos en el cálculo de las emisiones per cápita anuales de CO₂ y GEI para el año evaluado en el informe de 2013; se utilizan para este cálculo las emisiones brutas de CO₂ (en Gg de CO₂) y las emisiones brutas agregadas de GEI (en Gg CO₂eq) que son los índices que se utilizan, internacionalmente, con mayor frecuencia para este objetivo.

Ilustración 4.Emisiones per cápita de CO₂ (t CO₂/persona), y otros GEI (t CO₂ – eq/persona). Guinea Ecuatorial, 2013.



3.5. Grado de vulnerabilidad, pérdidas y daños

A pesar de que los niveles de las emisiones nacionales de CO₂ han disminuido en el periodo 2003-2010, sin embargo hay indicios de que los impactos pueden ser latentes. En efecto, el cambio de los factores ambientales se hace cada vez más agudo tanto la Región Insular como en la Continental, tomando como referencia los mismos intervalos temporales.

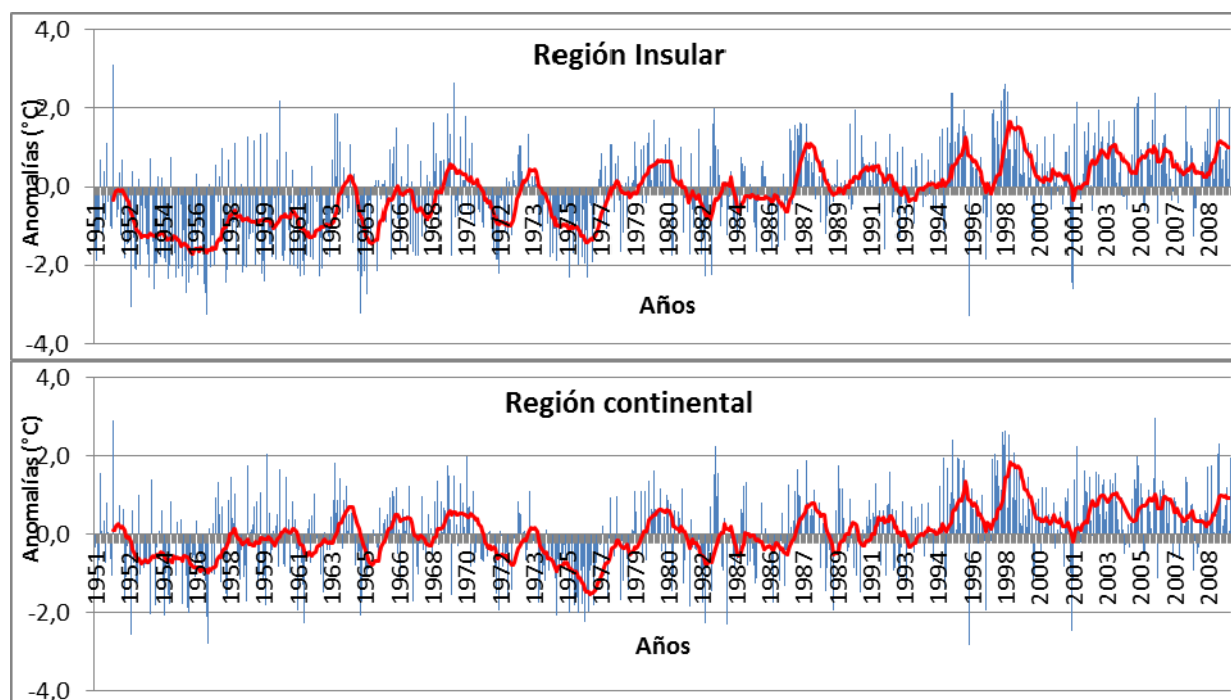


Ilustración 5.-Variación de los valores mensuales de la temperatura superficial para el periodo 1951-2019. La línea roja representa una media móvil de 12 ptos. Fuente: Ministerio de Pesca y Medio Ambiente, 2013. PANA. Figura nº12 de la página 34.

Guinea Ecuatorial al carecer de estaciones meteorológicas para la medición y evaluación de los factores climáticos (agrometeorología, hidrometeorología, isobaras eólicas, etc.), está limitada en conocimientos sobre cambio climático y sus efectos. En base a los pronósticos realizados, está expuesta a una mayor variabilidad de las precipitaciones (*sequía en general, mayores chubascos y días más soleados*), temperaturas más elevadas y un incremento del nivel del mar (*junto con tormentas más frecuentes y oleaje*). La población está confirmando cambios en el comportamiento del clima como tormentas más frecuentes, inundaciones, sequía de manantiales y por lo general temperaturas más elevadas (MPMA, PANA, 2013). Todo ello justifica su alta vulnerabilidad.

Se considera como sectores más vulnerables a los efectos del cambio climático: la agricultura, pesca, energía, vivienda, educación, saneamiento, drenajes, salud y medio ambiente. Las pérdidas derivadas de estos daños a pesar de ser muy considerables, actualmente son difíciles de cuantificar económicamente a falta de registros estadísticos.

4. NIVEL DE AMBICION

Guinea Ecuatorial es un país en vía de desarrollo, cuya economía depende exclusivamente de industrias extractivas y tiene que hacer frente a una serie de desafíos al desarrollo, como son: la pobreza, educación, salud, infraestructuras viales, etc. Aunque, en términos de emisiones, la República de Guinea Ecuatorial, representa menos del 0,1% de las emisiones mundiales, sin embargo, la tendencia de las emisiones de algunos sectores económicos son importantes, en especial la energía, emisiones de CO₂ de la biomasa, procesos industriales extractivos y cambios de usos de la tierra.

En el año 2007, el Gobierno adoptó el Plan Nacional para el Desarrollo Económico y Social (PNDES) al Horizonte 2020, el cual encaja perfectamente con los Objetivos del Milenio para el Desarrollo y las ambiciones para la reducción de las emisiones de CO₂; puesto que se apuesta por la diversificación de la economía, con un enfoque de la economía verde (*el turismo, silvicultura, negocios, etc.*).

En base a lo señalado anteriormente, **la ambición de Guinea Ecuatorial es reducir en un 20% de sus emisiones para el año 2030, con respecto a los niveles de 2010; a fin de alcanzar una reducción de 50% para el año 2050.** Eso, condicionado a que el apoyo sea favorable, previsible y, que se viabilice los mecanismos de financiamiento climático y se corrijan las distorsiones de los mecanismos de mercado existentes. Es necesario el apoyo técnico favorable y financiero favorable tanto del gobierno nacional como de la comunidad internacional.

5. ÁMBITO DE APLICACIÓN

El Gobierno de la República de Guinea Ecuatorial, consciente de que el cambio climático es un fenómeno a dimensión internacional, que constituye una prioridad y en el marco de su política de desarrollo, ha fijado acciones sobre la base de objetivos y orientaciones muy claras a través de las estructuras del Estado, colectividades locales, el sector privado así como organizaciones de la Sociedad Civil. Dicha orientación se basa en: medidas de adaptación y atenuación.

5.1. Adaptación al cambio climático

Con la adopción del Plan de Acción Nacional de Adaptación al cambio climático (PANA) en el año 2013, el país desarrolla la estrategia para fomentar la resiliencia al cambio climático en todos los sectores, con propuestas concretas a corto y a mediano plazos. Entre las acciones propuestas se destacan:

- Realización de diagnósticos periódicos sobre la vulnerabilidad climática a nivel nacional, conforme a los estándares internacionales;
- Construcción de estaciones meteorológicas en todo el ámbito nacional para el buen seguimiento de los factores climáticos en cada zona de la administración territorial;

- Instalacion de sistemas de alerta temprana para los riesgos climáticos y otras catástrofes naturales;
- Análisis periodicos de la capacidad de resiliencia de todas las infraestructuras acometidas y en curso;
- Ubicación de estaciones pluviométricas en las centrales hidroeléctricas para monitorear los cambios en las precipitaciones;
- Establecimiento de mecanismos para lograr la gestión integral de las cuencas hidrográficas;
- Fomento de sistemas de produccion agropecuaria con mejor resiliencia frente al cambio climatico;
- Restauración de diferentes ecosistemas susceptibles a perder su resiliencia.

5.2. Atenuación de las emisiones de GEI

5.2.1. Sector Energía

El Gobierno va a fortalecer las iniciativas actuales en el sector eléctrico aprovechando los recursos renovables disponibles, destacándose así las siguientes acciones:

- Elaboración y adopción de una Ley de Energía.
- Aprovechamiento del potencial hidroeléctrico del río Wele, para la electrificación de toda la Región Continental del país.
- Reforma y acondicionamiento de los centros hidroeléctricos de Musola (0.4-0.5 MW), Riaba (3.8 MW), para la electrificación de toda la isla de Bioko. Y Bikomo en la región continental (3.2 MW).
- Apuesta por las opciones de energía eólica, solar y/o mareomotriz para las islas remotas del país (Annobón, Corisco y otras).

5.2.2. Sector Transporte

- Adquisición de aeronaves dotadas de alta tecnología;
- Una Mejora de la gestión del tráfico aéreo, terrestre y marítimo
- Continuación de la modernización de las infraestructuras aeroportuarias, del tráfico rodado y las infraestructuras portuarias;
- Fomento del transporte colectivo urbano e interurbano para la reducción de Emisiones debidas a la proliferación de transporte individual.

5.2.3. Sector Silvicultura, Agricultura y Cambio de Uso de Suelos

- Fomento de una política basada en la ordenación y clasificación de tierras, mediante catastros.
- Implementación de la Estrategia de Reducción de las Emisiones por Deforestación y Degradación de bosques (REDD+).
- Convertir a Guinea Ecuatorial en un país de referencia en concepto de agricultura climáticamente inteligente para las zonas tropicales con los objetivos de garantizar la

seguridad alimentaria, diversificar la economía nacional, limitar las emisiones de metano y óxido nitroso, así como favorecer la captación de carbono.

- Puesta en marcha de Acciones Nacionales de Adaptación y Mitigación (NAMA's) para acompañar a la estrategia REDD+.
- Construcción de ciudades ecológicamente sostenibles con nuevos mecanismos de energía domiciliar, trazados con muchos espacios verdes y con un enfoque óptimo para la gestión de residuos.
- Implementación de la Estrategia Nacional y Plan de Acción sobre la conservación de la Diversidad Biológica (ENPADIB) y reforzar el Sistema Nacional de Áreas Protegidas (SNAP) con la incorporación al Programa de Reservas de la Biosfera de la UNESCO,
- Creación de dos Observatorios de nivel mundial, como:
 - Un Observatorio de Cambio Global de la alta montaña tropical asociado a la iniciativa internacional de investigación y cambio climático GLOCHAMORE (Global Change in Mountain Regions) en el Lago Loreto (sur de la isla de Bioko).
 - Un observatorio de Monzón en África Ecuatorial, en Monte Alen (Región Continental)

5.2.4. Sector Industrial

- Fomento de la política industrial basada en el uso de nuevas tecnologías
- Adopción de directivas sobre tipos de maquinarias y fijar los límites de las emisiones
- Adopción de directivas sobre métodos de operación de producción óptima.

5.2.5. Sector Residuos

- Fomento de la política de tratamientos eficientes de residuos y construcción de plantas para el reciclaje y reutilización de desechos.

6. FINANCIACIÓN

6.1. Para la adaptación al cambio climático

Tabla 1: Acciones de adaptación y sus costos estimativos (en millones de \$US)

Acciones	Costos estimativos	
	2015-2030	2030-2050
Realización de diagnósticos periódicos sobre la vulnerabilidad climática a nivel nacional, conforme a los estándares internacionales	12,3	14,5
Construcción de estaciones meteorológicas en todo el ámbito nacional para el buen seguimiento de los factores climáticos en cada zona de la administración territorial	17,5	13,5
Instalación de sistemas de alerta temprana para los riesgos climáticos y otras catástrofes naturales	15,2	28,7
Análisis periódicos de la capacidad de resiliencia de todas las infraestructuras acometidas y en curso	11,5	22,3
Ubicación de estaciones pluviométricas en las centrales hidroeléctricas para monitorear los cambios en las precipitaciones	16,5	31,2

Establecimiento de mecanismos para lograr la gestión integral de las cuencas hidrográficas	12,7	25,3
Fomento de sistemas de producción agropecuaria con mejor resiliencia frente al cambio climático	13,5	17,3
Restauración de diferentes ecosistemas susceptibles a perder su resiliencia	15,3	18,5
Total	114,5	171,3

6.2. Para la atenuación de las emisiones de GEI

Tabla 2: Sectores de atenuación y sus costos estimativos (en millones de \$US)

Sectores	Costos estimativos	
	2015-2030	2030-2050
Sector Energía	544,5	914,7
Sector Transporte	834,6	1324,5
Sector Silvicultura, Agricultura y Cambio de Uso de Suelos	623,7	836,3
Sector Industrial	1435,3	2356,8
Sector Residuos	235,2	523,5
Total	3673,3	5955,8

6.3. Para otras necesidades institucionales y de fortalecimiento de capacidades

Tabla 3: Otras necesidades y sus costos estimativos (en millones de \$US)

Temáticas	Costos estimativos	
	2015-2030	2030-2050
Necesidades institucionales	44,5	64,2
Información, sensibilización y educación sobre cambio climático	24,8	32,3
Formación e investigación aplicada al cambio climático	83,7	123,7
Total	153,0	220,2

7. NECESIDADES

7.1. Necesidades institucionales

- Elevar el tema de Cambio Climático a rango de Secretaría de Estado;
- La creación de un Comité de Modelización Económica de los Impactos del Clima y de la Integración del Cambio Climático en el presupuesto del Estado;
- Creación de un Comité Nacional de Cambio Climático;
- Creación de un servicio encargado de Evaluaciones de Impactos Ambientales y Auditorías Ambientales nacionales conforme a los estándares internacionales.

7.2. Información, sensibilización y educación sobre cambio climático

- Desarrollo de programas de información y sensibilización sobre las amenazas del cambio climático para abarcar cada vez más al gran público.

- Desarrollo de módulos de educación formal e informal en cuanto a la importancia y la conservación del medio ambiente;
- Publicación de revistas, folletos, agendas medioambientales y otro material para fomentar la conciencia medioambiental a nivel nacional.
- Desarrollo de planes de acciones conjuntas sobre la conservación de la biodiversidad, lucha contra la desertificación, para fortalecer la sinergia entre las tres convenciones del Río y otras signatarias por el país.

7.3. Formación e investigación aplicada al cambio climático

- Desarrollo de módulos de formación especializada en técnicas de adaptación y mitigación
- Operacionalización y equipamiento del Instituto Nacional para la Conservación del Medio Ambiente (INCOMA), para las investigaciones ambientales aplicadas.
- Fomento de investigación científica y tecnológica en Adaptación y Atenuación.
- Dotación de laboratorios de sistema de información geográfica (SIG) a la universidad nacional de Guinea Ecuatorial (UNGE) y a las escuelas profesionales de la rama forestal y medioambiental para la modelización climática y fomento de hábitos de investigación,
- Desarrollo de concursos y las ofertas de investigación de diferentes modalidades sobre el dominio de cambio climático.
- Operacionalización del Fondo Nacional para el Medio Ambiente (FONAMA)

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Ministerio de Pesca y Medio Ambiente (MPMA). *Contribuciones Previstas Determinadas a nivel Nacional*. Malabo, Agosto de 2015.

Material de apoyo: (I) Informe sobre inventario nacional de gases de efecto invernadero de 2013, por el MPMA con el apoyo financiero de GEF; (II) Plan de Acción Nacional para la Adaptación al cambio climático (PANA), adoptado en 2013, por el MPMA gracias al apoyo financiero de GEF/PNUD; y (III) Programa de Desarrollo Socio-económico Horizonte 2020, Ministerio de Planificación y Desarrollo Económico; Primera Comunicación Nacional de Cambio Climático en Guinea Ecuatorial. (IV) Documento de proyecto “Energía sostenible para todos”-PIMS 5143.



Arab Republic of Egypt

**EGYPTIAN INTENDED NATIONALLY
DETERMINED CONTRIBUTION**

The Arab Republic of Egypt

Intended Nationally Determined Contributions as per United Nation Framework Convention on Climate Change

1. PREAMBLE

In accordance with Decisions 1/CP.19 and 1/CP.20, the Arab Republic of Egypt hereby submits its report on the Intended Nationally Determined Contributions (INDCs) towards achieving the objectives of the United Nations Framework Convention on Climate Change (UNFCCC) set forth in Article 2 thereof. The report provides information which enhances clarity, transparency, and understanding of Egypt's INDC.

INDC Definition:

Measures determined and intended to be applied by the country to face climate change in terms of adaptation (to climate change impacts) and mitigation (reducing greenhouse gas emissions).

The INDC Report includes the following elements:

1. National circumstances that address general economic conditions, including economic and population growth rates, major sustainable development goals, and political circumstances.
2. National efforts implemented to combat climate change in Egypt, in terms of treating impacts in different sectors (agriculture, water resources, coastal zones, etc.) or efforts made to reduce GHGs emissions in different sectors (energy, transportation, industry, etc.).
3. Required implementation mechanisms to achieve the objectives of the plan (funding, capacity building, and technology transfer).

Summary of Intended Nationally Determined Contributions are presented in the following sections.

2. NATIONAL CIRCUMSTANCES

The Egyptian environment is influenced by many national, regional, and global factors. National factors include, but are not limited to, the following:

2.1 Population Growth

Globally, Egypt ranks 16th in terms of population estimated at 89 million (August 2015). Between 1990 and 2015, the population grew by 30 million inhabitants, with an annual growth rate of 2.2%, and a total increase of 30% compared to 1990 census. UN population prospect reports anticipate that the annual growth rate will remain over 2% until 2040, where The Egyptian population is estimated to reach 116 million

inhabitants.

As per the World Bank, the population density was estimated at 82.43 inhabitant/km². In 1990, the population density was 58.1 inhabitant/km². Rural population, as a percentage of total population, was 56 %, 57% and 57%, in 1990, 2000, and 2010 respectively.

High population growth rates and densities impose huge pressure on the economic, social, and environmental dimensions of sustainable development.

2.2 Economic Conditions

- **Economic Situation during FY 2014/2015**

2014/2015 Fiscal Year (FY) witnessed a significant improvement in the real economic growth rate, which increased during the first nine month of this year to reach 4.7%. The growth rate is expected to reach 4% by the end of FY 2014/2015 with a major contribution from the service sector. The net direct foreign investment reached \$6.4 billion during FY 2014/2015 compared to about \$4.1 billion last year, which represents an increase of approximately 55%. Moreover, the recent efforts and reform simply-mindedly the government were successful in improving and stabilizing the credit rating of Egypt. In addition, the unemployment rate has fallen in the period April-June 2015 from 13.3% to 12.7% compared with the same period during the two previous years. The foreign debts decreased by the end of July 2015 to \$47.1 billion compared to \$48.1 billion in June 2015. Despite the noticeable improvement in the economic indicators, the Egyptian economy is still facing certain ongoing challenges. These challenges include the high inflation rate and the trade deficit caused by the decline in petroleum exports as a result of the falling world oil prices, along with the increase in the balance of payments on commodity imports.

- **Planned Economic Situation during FY 2015/2016**

The Economic and Social Development Plan for FY 2015/2016 aims at increasing the real economic growth rate to reach 5.5% and puts special emphasis on national mega projects.

- **Planned Economic Situation up to 2030**

In light of the current global trend towards the adoption of post-2015 sustainable development goals, Egypt has developed the "*Sustainable Development Strategy; Egypt's Vision 2030*" which serves as a roadmap for the country to achieve its desired sustainable development goals during the next 15 years. This strategy promotes the optimum use of available resources, enhancement of Egypt's competitiveness and revival of its historic leading role in the region. Moreover, such strategy aims at fulfilling the aspirations of the Egyptian people regarding their right to a decent standard of living. The goals outlined in the strategy are in line with the global sustainable development goals (SDGs).

2.3 National Objectives and Priorities

- Create an enabling and favorable environment for local and foreign private investment, redistribute investments in a manner, which ensures geographical balance, develop the State's administrative apparatus and fight corruption.
- Improve the living standards of citizens, empower the youth through the provision of decent and productive job opportunities and build their skills in order to keep up with the demands of the competitive labor market.
- Create an enabling infrastructure for the development of Micro, Small and Medium Enterprises (MSME) and provide substantial support to vocational education and training.
- Focus efforts on controlling population growth.
- Support the current production base and remove barriers.
- Focus on marginalized social groups, and those mostly affected by economic reform policies.
- Combat all forms of corruption, apply required restructuring measures, and enforce the new Civil Service Law no. 18/2015.
- Implement economic structural reforms to increase productivity, provide job opportunities, and generate income for different community sectors.
- Provide protection to the poor, the low-income groups and the middle class.

National Mega Projects Planned in the Near Future:

- Development of Suez Canal Axis Project
- Reclamation of One and a Half Million Feddan Project as part of a long-term plan to reclaim 4 million Feddans
- One Million Housing Units Project, within the framework of social housing program
- New Development Axis
- Mega Storage and Logistics Centers
- Golden Triangle of Mineral Wealth in South Egypt
- Fourth and fifth phases of the underground metro
- Development of priority areas including Sinai/the Western North Coast and its desert hinterland/South Egypt
- Construction of the new administrative capital

National Objectives and Priorities are further elaborated in the "Egyptian National Strategy for Sustainable Development" and include the following:

- Competitiveness and diversity
- Expanding the scope of sustainable growth
- Activating Egypt's role in the global economy and improving its ability to adapt to global changes
- Increasing the real per capita GDP to reach the same level of middle-income countries
- Improve the legislation and legal frameworks promoting the dynamics of sustainable and decentralization development.

2.4 Political and Social Context

- Egypt has witnessed many positive developments during the past year with regards to political stability. In January 2014, a new constitution was adopted and in May 2014 President Abdel Fattah El-Sisi was elected as President of the Republic. Moreover, holding the parliamentary elections set for October and November 2015 is the final step in the implementation of the country's political roadmap.
- Concerning social justice, the government seeks to achieve the following goals:
 - Expand social security allocations to include self-employed farmers who own more than one Feddan and expand their medical insurance.
 - Launch a cash transfer programme and increase the number of beneficiaries.
 - Establish logistic centers for grain trade and storage to achieve food security.
 - Replace traditional ration books with smart cards, adopt a new rationing system and apply the new bread supply system.
- Upon assuming office, President Abdel Fattah El-Sisi announced a wide range of projects and reform plans. During Egypt Economic Development Conference (EEDC) that was held 13-15 March 2015, the Government launched its economic reform program designed to restore fiscal stability, drive growth rates, and attract domestic and international investors in key sectors.
- Egypt has witnessed significant improvement in a number of social indicators over the past two decades. However, Egypt still seeks to increase human development rates. Children death rates and malnutrition cases have been reduced by 50%. In the meantime, life expectancy has risen from 64 to 71 years during the same period.

3. NATIONAL EFFORTS in ADAPTATION AND MITIGATION

3.1 Egypt's Adaptation Efforts

3.1.1 Adaptation Challenges (Climate Change Risks)

The vulnerability of Egypt's water resources to climate change depends on Nile flows, rainfall, and ground water.

In the agricultural sector, climate change studies expect that the productivity of two major crops in Egypt - wheat and maize –will be reduced by 15% and 19%, respectively, by 2050. Losses in crop productivity are mainly attributed to frequent temperature increase, irrigation water deficit, and pests and plant disease. In addition, 12% to 15% of the most fertile arable land in Nile Delta is negatively affected by sea level rise and salt water intrusion.

In terms of livestock production, current evidence shows that temperature rise leads to harmful heat stress, which negatively impacts livestock productivity. New animal

diseases have emerged in Egypt, which have strong negative impacts on livestock production. These include bluetongue disease and rift valley fever, which are both attributed to significant changes in the Egyptian climate.

Climate change is expected to increase seawater temperature, shifting fish distributions northwards to live in deeper waters. In addition, increased water salinity in the coastal lakes in Egypt is expected to negatively affect fish species.

Coastal zones are expected to suffer from climate change direct impacts. These include sea level rise and the overflow of low-level land. Estimations indicate that sea level rise by 50 cm leads to serious impacts on low-level lands in Delta and adjacent highly populated cities such as Alexandria and Port Said. Consequently, this will result in a more significant challenge, which is the migration of people from the affected areas to other areas, thus affecting the efficiency of different services and increasing the financial cost required for their development.

As for the tourism sector, coral reefs which constitute a major attraction in Red Sea resorts are highly vulnerable to climate change. In urban areas, heat islands¹ formed by hot air arising from the increasing use of energy in buildings represent the main concern in hot arid climates.

In addition, one of the most significant potential negative impacts of climate change is the harm inflicted on national heritage as result of temperature rise, sandy winds and ground water. However, this is not just a national concern. Instead, it is a global challenge since this heritage is part of the human heritage.

In the health sector, climate change increases direct and indirect negative impacts on public health in Egypt. For example, in 2015 the negative impacts are represented in higher death rate due to heat stress.

In the energy sector, the increase in temperature negatively affects the efficiency of conventional power plants and photovoltaic cells. Moreover, the sea level rise threatens the electric power plants and networks located along the coasts. Also, the negative impact of climate change on rainfall rates and rain distribution across different regions negatively affects power generation from hydropower plants. This, of course, is in addition to the increased electricity consumption rates as a result of the use of air conditioners.

¹ Heat island is a meteorological phenomenon which happens in cities. Spaces between high buildings from different sides traps heat, which affects weather in cities.

3.1.2 Egypt's Intended Actions to Promote Resilience

a. Water Resources

Several measures are currently being considered to adapt to decreasing water resources or increasing Nile flows. These primarily include:

- Maintaining water level in Lake Nasser
- Increasing water storage capacity
- Improving irrigation and draining systems
- Changing cropping patterns and farm irrigation systems
- Reducing surface water evaporation by redesigning canal cross sections
- Developing new water resources through upper Nile projects
- Rain water harvesting
- Desalination
- Treated wastewater recycling
- Increased use of deep groundwater reservoirs

In addition, public awareness is being raised on the need for rationalizing water use, enhancing precipitation measurement networks in upstream countries of the Nile Basin, encouraging data exchange between Nile Basin countries, and developing Circulation Models to predict the impact of climate change on local and regional water resources.

b. Agricultural Security

Changing sowing dates and good management practices are among the important adaptation measures oriented to mitigate climate change. Changing cultivars to those that are more tolerant to heat, salinity and pests, and changing crop pattern are the most promising adaptation measures at the national level. Moreover, using different multi-level combinations of improved surface irrigation systems and applying deficit irrigation are successful means of increasing surface irrigation system capacity in traditional lands to overcome the negative impacts of climate change.

Concerning livestock, improving the current low productivity of cattle in addition to improving feeding programs are being considered. No clear adaptation options are defined for fishery wealth.

There is a dire need for further studies on the impacts and adaptation to climate change in the agricultural sector in order to develop an adaptation strategy, which overcomes the barriers to implementing adaptation measures. These barriers include limited scientific information and strategic visions, and lack of financial support.

c. Coastal Zones

Adaptation options for coastal zones are highly site-dependent. However, changes in land use, integrated coastal zone management, and proactive planning for protecting coastal zones are necessary adaptation policies. Providing job opportunities in safe areas (in locations that are not impacted by climate change) is an important priority to successfully absorb affected population.

d. Additional Adaptation Policies and Measures

Egyptian authorities are currently focusing on the following additional policies and procedures:

- Building institutional capacities of comprehensive collection and analysis of monitoring and observations and geographic data;
- Identifying indicators and conducting full assessment of vulnerable sectors and stakeholders;
- Enforcing environmental regulations;
- Identifying and applying protection measures of vulnerable touristic and archaeological sites and roads against extreme natural phenomena such as floods, dust storms and extreme weather conditions;
- Building capacities for using regional water circulation models
- Proactive planning and integrated coastal zone management
- Risk reduction; and
- Increasing awareness of stakeholders for energy and water utilization

3.1.3 Adaptation Action Packages

Coastal Zones:

1. Reduce climate change associated risks and disasters.
2. Capacity building of the Egyptian society to adapt to climate change and associated risks and disasters.
3. Enhance national and regional partnership in managing crises and disasters related to climate change and the reduction of associated risk.

Water Resources and Irrigation:

- 1- Increase investments in modern irrigation systems.
- 2- Cooperate with Nile Basin countries to reduce water evaporation and increase river capacity.
- 3- Develop national policies to encourage citizens on water use rationalization.

Agricultural Sector:

- 1- Build an effective institutional system to manage climate change associated crises and disasters at the national level.
- 2- Activate genetic diversity of plant species with maximum productivity.
- 3- Achieve biological diversity of all livestock, fishery, and poultry elements to protect them and ensure food security.
- 4- Develop agro-economic systems and new structures to manage crops, fisheries and animal production, which are resilient to climate changes.
- 5- Increase the efficiency of irrigation water use, while maintaining crop productivity and protecting land from degradation.

- 6- Review of new and existing land use policies and agricultural expansion programs to take into account possibilities of land degradation in Delta and other affected areas resulting from Mediterranean Sea level rise.
- 7- Develop systems, programs and policies to protect rural community and support its adaptive capacity to the expected trend in land use change, plant and animal production, and internal migration due to climate change.

Health Sector:

- 1- Identify potential health risks as a result of climate change.
- 2- Raise community awareness about climate change risks and means of adaptation.
- 3- Increase the efficiency of healthcare sector and improve the quality of health services in dealing with climate change.
- 4- Support Ministry of Health efforts to improve the social and economic status and population characteristics.

Rural Areas, Population, and Roads

- 1- Draw a baseline scenario for the optimal regional distribution of population and economic activities within the geographical boundaries of Egypt up to the year 2100, taking climate change into consideration.

Tourism Sector

- 1- Reduce climate change risks in touristic areas.
- 2- Engage users in supporting the proposed strategy.
- 3- Support periodical monitoring and observations systems and follow-up bodies.
- 4- Raise environmental awareness.
- 5- Cooperate with international bodies.
- 6- Incorporate disaster risks within the plans to promote sustainable tourism in Egypt.
- 7- Capacity building of local communities in touristic areas.

Energy Sector

- 1- Conduct comprehensive studies to assess the impact of climate change on the energy sector, propose appropriate adaptation measures, and estimate the economic cost of the proposed adaptation measures. In addition, these studies should determine the safe locations for the construction of power generation projects.
- 2- Build institutional and technical capacities of different units in the energy sector in climate change issues.
- 3- Support research and technological development to enable the electricity sector to deal properly with climate change.

3.2 Mitigation Policies and Measures

3.2.1 Mitigation Policies

The key for Egypt to mitigate GHGs emissions is to provide appropriate foundations for the development of low carbon energy systems.

Pathways to achieving high CO₂ mitigation levels comprise the following:

- Widespread diffusion of locally-appropriate low-carbon energy production technologies, with substantial reductions in energy intensity
- Comprehensive mitigation efforts covering all major sources of emissions
- Locally-appropriate technology transfer and financial flows from industrialized countries (Annex I countries) to support carbon emission abatement according to the UNFCCC principles, which acknowledges that developed countries should provide required support to developing countries in this regard.

Policies targeting development that is more sustainable rely upon five main pillars:

1. More efficient use of energy, especially by end users;
2. Increased use of renewable energy as an alternative to non-renewable energy sources;
3. Use of advanced locally-appropriate and more-efficient fossil fuel technologies, which is less-emitting, in addition to new generations of nuclear power;
4. Energy efficiency is the cornerstone to be targeted by policy makers to decouple demand on energy and economic growth; and
5. Reform energy subsidies. This policy is implemented using four pillars, namely: set different prices for petroleum products based on energy generation efficiency; increase the efficiency of energy use; provide support to certain sectors to promote switching from conventional energy sources to clean energy sources; and apply the fuel subsidy smartcard system to ensure that subsidies are received by target beneficiaries.

The degree to which efficiency improvements can limit energy demand growth is one of the main distinguishing characteristics of greenhouse gas reduction pathways. Energy efficiency could be improved radically through a combination of behavioral changes and rapid introduction of stringent efficiency regulations, technology standards, and environmental externality pricing, which mitigates rebound effects.

Renewable energy technologies, which are relevant to the local context, will play a very important role in reducing GHG emissions, but they would not suffice to keep climate change manageable. However, renewable energy may provide a number of opportunities since it also addresses sustainable and equitable economic development, energy access, secure energy supply, and reduced local environmental and health impacts.

In addition, efforts in Egypt should focus on replacing or upgrading obsolete infrastructure e.g. upgrading old fossil fuel power plants with locally appropriate technologies to increase its capacity. This needs increase financial support from Annex I parties in addition to technology transfer and local capacity building.

There are four key technology-related requirements essential for transformation: (i) continued support of energy conversion efficiencies, (ii) carbon capture and storage “CCS” as a technology alternative that can be used in the future if proven economically feasible,(iii) co-utilization of fossil fuel and biomass in the same plants, and (iv) utilization of co-generation plants.

Using advanced generations of nuclear reactors could be important to fill the gap between reducing fossil fuel dependence and the deployment of renewable energy. In addition, nuclear energy can be an important contributor in the future energy mix to stabilize CO₂ levels as energy demand continues to grow.

Additional mitigation measures include the increase of the country’s CO₂ absorptive capacity through plantation, maintaining suitable types of trees along road sides, the middle-island of inter-city and urban roads, and on irrigation and drainage canal banks. In addition, wood forests should use treated wastewater for irrigation.

3.2.2 Mitigation Actions

The two following tables present the most important mitigation actions across different sectors at the national level.

Table 2. Greenhouse Gas Mitigation Measures in Different Energy Sub-Sectors

Sector	Mitigation measure
Industry	Energy efficiency improvements
	Utilization of solar energy for water heating
Transportation	Energy efficiency improvements
Passengers	Increase Share of Railways Pass. Transport
	Increase Share of Buses Pass. Transport
	Increase Share of Microbuses Pass. Transport
	Increase Share of River Pass. Transport
	Cairo metro (Line 3 phase 3& 4 + Line 4)
Freight	Improve road transport efficiency
	Switch from road to river transport
	Switch from road to rail transport
Agriculture	Energy efficiency improvements
Res. & Comm.	Energy efficiency improvements
	Utilization of solar energy for water heating
Electricity	Energy efficiency improvements
	Nuclear energy use for power generation
	Renewable energy use for power generation
Petroleum	Energy efficiency improvements

Table 3. GHGs Emissions Reduction Actions in Non-Energy Sectors

Sector	Mitigation Measure
Agriculture	Enteric fermentation
	Manure management
	Rice cultivation
	Agricultural soils
	Field burning of agricultural residues
Waste	Solid waste
	Wastewater
	Incineration
Industrial Processes	Encourage waste management and recycling
	Optimize the production of cement, lime, iron and steel, ammonia not used in urea, nitrogenous fertilizers and nitric acid.
Oil and Natural Gas	Production and processing
	Venting and flaring (waste heat)

4. NEW MARKET MECHANISMS

A national market for carbon trading may be established. This national market may further be developed into a regional market, which can attract foreign direct investment in national carbon credit transactions, especially in the Arab and African region.

5. NEED FOR STRONG ECONOMIC APPROACH

Within this context, Egypt needs to develop and implement a strong economically feasible mitigation program in the near future, which would achieve the proposed emission reduction for 2030 at the lowest cost to the national economy.

Hence, an Egyptian comprehensive emission reduction program should be based on three main initiatives:

1. Stimulate mitigation actions through a portfolio of strong and coordinated policies for the efficient reduction of GHGs across industry sectors and different geographic areas.
2. Pursue energy efficiency and low-cost options through the following:
 - Fast development of the infrastructure required for low-carbon energy systems; and

- Encouraging research and development in promising technologies, which are suitable for the local context and stimulate their deployment.

3. Develop a national monitoring, reporting, and verification system.

The initial total estimated cost of implementing adaptation measures aiming at mitigating the negative impacts of climate change and the national endeavors aiming at contributing to the efforts made by the international community to reduce GHG emissions during the period 2020-2030 is estimated at USD 73 billion. This figure is adapted to inflation rates and change in currency exchange rate for this period.

6. MEANS OF IMPLEMENTATION

Implementation of INDCs requires sustainable international support from reliable resources through financial flows, capacity building, and technology transfer as relevant to the local context.

Preliminary estimates of the financial contributions required for implementing the INDCs for both adaptation and mitigations estimated at approximately 73.04 billion USD can be increased. In addition, transfer of technology appropriate to the local context and national capacity building are needed. Thus, Article 4 of the UNFCCC, which states that developed parties shall provide support to developing countries in applying their liabilities, should be enacted. Hence, Egyptian national efforts alone will not be able to fulfill the State aspirations in contributing to the international climate change abatement efforts. Depending only on local financial resources, along with the large development aspirations of Egypt, will limit this contribution.

Gobierno de El Salvador
Ministerio de Medio Ambiente y Recursos Naturales (MARN)

CONTRIBUCION PREVISTA Y DETERMINADA A NIVEL NACIONAL DE
EL SALVADOR

San Salvador
Noviembre 2015

Marco General

El Salvador presenta esta Contribución Prevista Nacionalmente Determinada (CPND), en base a la premisa de que la negociación del acuerdo de 2015, se realiza y concreta bajo la Convención Marco de Naciones Unidas para el Cambio Climático (CMNUCC) y se guía y rige legalmente por sus principios y disposiciones, con miras a mejorar la aplicación plena, eficaz y sostenida de la Convención y lograr su objetivo. El país está comprometido en la adopción de un nuevo acuerdo vinculante aplicable a todas las Partes, y aspira a que bajo este nuevo instrumento jurídico se limite el aumento de la temperatura media global a 1.5 °. La implementación de la CPND de El Salvador depende del logro de un ambicioso acuerdo, con el que la sociedad en su conjunto se encuentre comprometida, y que cuente con el apoyo internacional necesario que facilite los recursos y promueva y estimule las inversiones para fortalecer la resiliencia y la construcción de un desarrollo bajo en carbono. La CPND se actualizará periódicamente y según corresponda.

Históricamente y hasta el presente, El Salvador ha generado muy bajas emisiones de gases de efecto invernadero (GEI) por lo cual su aporte es no significativo a nivel global. Por lo tanto, ante los importantes impactos y afectación que los fenómenos asociados al cambio climático, tienen ya sobre nuestro proceso de desarrollo y esfuerzos para la superación de la pobreza, la CPND en materia de adaptación es de la mayor trascendencia y prioridad para el país. A pesar de ello, El Salvador se encuentra firmemente comprometido con alcanzar un acuerdo mundial 2015 sustantivo y equitativo para enfrentar la amenaza del cambio climático, desarrollando sus mejores esfuerzos en materia de mitigación, priorizando aquellas acciones y contribuciones que conlleven co-beneficios socio-económicos y promoviendo, en donde corresponda, el enfoque de mitigación basada en adaptación, tal como indicado en sus programas de restauración de ecosistemas y paisajes y otras iniciativas relacionadas con los bosques.

En el marco del proceso de preparación de su CPND, El Salvador presenta una serie de contribuciones destinadas en primer lugar, a establecer un marco de legislación y arreglos institucionales que orientan el desarrollo económico y social hacia las bajas emisiones y la adaptación al cambio climático. Asimismo, se presentan algunas metas de carácter cuantitativo hacia el año 2025 y 2030 que serán debidamente consensuadas, cuantificadas y presentadas en algunos casos antes de las COP 22 y COP23.

Es importante también resaltar que la implementación de las acciones identificadas tiene como requisito el acceso a los medios de implementación y financiamiento necesarios. En ese sentido, el pleno cumplimiento de los compromisos asumidos por El Salvador en su CPND está sujeto a que impactos destructivos y daños de fenómenos meteorológicos asociados al cambio climático o provenientes de otros riesgos geológicos propios de la región no alteren la disponibilidad prevista de recursos, la línea base desde la cual se hayan establecido las metas de las contribuciones o que alteren el marco de prioridades nacionales, en especial las de atención a población en situación de vulnerabilidad. Lo mismo para el caso de choques económicos que afecten significativamente las relaciones de comercio y previsión de los ingresos nacionales.

1. Contexto e impactos socio económicos del cambio climático en El Salvador y niveles de emisiones de gases de efecto invernadero.

De acuerdo al Quinto Informe de Evaluación del IPCC, “Centroamérica ha sido tradicionalmente caracterizada como región con alta exposición a amenazas geo-climáticas derivadas de su localización y topografía y con una alta vulnerabilidad de sus asentamientos humanos (CEPAL, 2010c). También ha sido

identificada como la región tropical más sensible al cambio climático". (Giorgi, 2006)." (Cuadro 27-1, página 1508. Report of Working Group II).

En Centroamérica existe una amplia evidencia de variabilidad climática en diversas escalas de tiempo, desde variabilidad intra-estacional hasta de largo plazo. El cambio climático incrementa la variabilidad del clima y cambia patrones de lluvia tales como: a) Influyen más los sistemas del Océano Pacífico y del Atlántico; b) se registran lluvias mucho más intensas, y c) Eventos de exceso de lluvia o de falta de lluvia de mayor duración.

En consecuencia, buena parte de los territorios regionales enfrentan una alta exposición física de su población ante las amenazas naturales climatológicas, meteorológicas e hidrológicas. Según el Índice de Vulnerabilidad Socioeconómica (IVS) y el Índice Municipal de Riesgo Manifiesto (IRM), ciento quince de los doscientos sesenta y dos municipios de El Salvador se encuentran en situación de vulnerabilidad media, alta y extrema, donde habita el 63.3% de la población. El 9.2% de ella se encuentra en situación de Vulnerabilidad Socioeconómica extrema, concentrada principalmente en los departamentos de San Vicente y San Miguel. Por otro lado, el territorio salvadoreño forma parte del denominado Corredor Seco de Centroamérica, que lo constituye un grupo de ecosistemas que se combinan en la eco-región del bosque tropical seco con unas condiciones biofísicas y de temperatura, evotranspiración y precipitación particulares. El Corredor Seco debido a esas condiciones naturales se caracteriza por sufrir fenómenos cíclicos de sequía severa y alta, que aunado al mal uso de la tierra e inadecuadas prácticas agrícolas, expansión de la frontera agrícola sin regulación, proliferación de asentamientos humanos sin planificación, alta vulnerabilidad de los pequeños productores de granos básicos y una falta de ordenamiento territorial, representa una de las zonas de mayor vulnerabilidad en toda la región.

Estos altos niveles de exposición física ante fenómenos climatológicos, en poblaciones altamente vulnerables repercuten en el ámbito económico y social generando daños y pérdidas que se elevan a varios cientos de millones de dólares, estos recursos desplazan a la inversión pública y privada y reducen el stock de capital en detrimento del crecimiento económico territorial y generan un fuerte impacto en la esperanza y calidad de vida de la población¹.

En El Salvador, al considerar como eventos hidro-meteorológicos extremos aquellos que producen una precipitación arriba de 100 mm en 24 horas y una precipitación acumulada de más de 350 mm en 72 horas, resulta significativo el aumento progresivo de esos fenómenos climáticos extremos. Se registró uno en la década de los sesenta, otro en la de los setenta, dos en la de los ochenta, cuatro en la de los noventa y ocho en la primera década de este siglo. La Comisión Económica para América Latina (CEPAL) ha señalado que de 1980 a 2008 se produjo en el país una media de 1.5 desastres naturales por año que provocaron la muerte de casi 7,000 personas, afectaron a 2.9 millones más y tuvieron un costo estimado de US\$470 millones anuales, equivalente a 4.2% del Producto Interno Bruto (PIB). Los daños económicos anuales relacionados a fenómenos climatológicos son altos; solamente entre noviembre de 2009 y octubre de 2011, se perdieron más de USD\$ 1,300 millones o su equivalente al 6 % del PIB del 2011.

En las últimas seis décadas la temperatura promedio anual en El Salvador se incrementó en más de 1.3 grados centígrados, cuando la temperatura media global ha ascendido solo 0.8 sobre la media existente en la era pre-industrial. Al mismo tiempo, en dicho periodo el nivel del mar aumentó casi 8 centímetros. Un análisis del Ministerio de Medio Ambiente y Recursos Naturales (MARN) y la Comisión Económica para América Latina y el Caribe (CEPAL) de los registros diarios de precipitación para el periodo de 1971-2011

¹ Estudio Informe Final: Vulnerabilidad Socioeconómica ante el Cambio Climático en El Salvador. Cabrera y Amaya. RIMISP 2013.

mostró que en la década 2001-2011 hubo un fuerte aumento de eventos que sobrepasaron el umbral de 100 mm, 150 mm y 200 mm en dos días, cinco días y 10 días de lluvias, respectivamente relativo a las décadas anteriores, rompiendo diversos records de intensidad y duración, como se ha descrito en detalle en la Segunda Comunicación Nacional. Como resultado de esta dinámica, El Salvador ha experimentado un incremento en la última década de desastres vinculados a eventos hidro-meteorológicos extremos, tales como; la Baja Presión E96/Ida, Tormenta Tropical Agatha; Depresión Tropical 12E y Sequías meteorológicas fuertes y recurrentes de los años 2012 al 2015. En 2015 se presentaron dos fenómenos de sequía meteorológica fuerte, con 20 y 24 días secos consecutivos cada uno; la sequía meteorológica de 2014 alcanzó 31 días secos consecutivos, la de 2013 alcanzó 23 y la del 2012 alcanzó 32.

Los escenarios climáticos proyectados apuntan a aumentos de entre 2 y 3 grados centígrados en las siguientes seis décadas, dependiendo de los esfuerzos que se realicen a nivel planetario para mitigar el calentamiento global, en el marco de los compromisos que se establezcan en el acuerdo de 2015. El aumento de temperatura, junto con los cambios que se prevén en los patrones de precipitación, tendrán graves implicaciones para la disponibilidad hídrica, la agricultura, la seguridad alimentaria, la infraestructura, la generación de energía, la salud, la actividad turística y otros ámbitos esenciales para el desarrollo económico y el bienestar de la población salvadoreña. Los impactos previsibles del cambio climático serán particularmente fuertes en la zona costera-marina y en la región oriental del país, afectando territorios de importancia estratégica en términos de su riqueza como capital natural, vocación y potencial de desarrollo turístico.

Crecientemente, la variabilidad climática asociada al cambio climático, es la principal causa de la fluctuación anual de la producción agrícola en El Salvador como consecuencia de los extremos, tanto de lluvia como de sequía. Esta variabilidad del clima, exacerbada por el calentamiento global y cambio climático, incide directamente en el surgimiento de fenómenos climatológicos extremos que producen impactos negativos para el desarrollo socioeconómico del país, incrementan su vulnerabilidad derivada tanto de su alta degradación ambiental como de los importantes déficit sociales acumulados, presionando sus finanzas públicas e inversión productiva; limitando su crecimiento económico y agudizando su problemática de pobreza.

La economía salvadoreña se ha caracterizado por un bajo crecimiento debido a factores estructurales. La crisis financiera global de 2008 implicó consecuencias negativas para el país impactando fuertemente los indicadores económicos. Las exportaciones y las remesas cayeron, el desempleo se incrementó y los precios de la energía y de los alimentos aumentaron (BM, 2015). Entre 2007 y 2008, el porcentaje de pobreza creció del 34.6% hasta el 40% y en 2009, la economía salvadoreña registró una contracción del PIB del 3.1%, presentándose a partir del siguiente año un relativo estancamiento en sus tasas de crecimiento menores del 2% anual. Entre 2011 y 2013, la economía creció a un 1.9% anual, por debajo del promedio de América Latina y El Caribe (3.7%). En 2014, el crecimiento fue de 2% (BCR, 2015) y las proyecciones para 2015 son del 2.4%² (BCR, 2015). Esta dinámica económica descrita anteriormente representa otro gran desafío para el país.

Por otro lado, esfuerzos importantes de inversión pública en programas de protección social han venido impactando positivamente los índices de pobreza medida por ingresos, pasando de una tasa del 34,5% en 2012 a un 28,9% de población viviendo en pobreza hasta el 2013. Para ese mismo periodo, El Salvador según la medición 2014 del Índice de Desarrollo Humano (IDH), se ubica en la posición 115 entre 187 países clasificados. Aumentando levemente su IDH de 0,660 del 2013 a 0,662 del 2014.

² Datos estimados a septiembre 2015 del Banco Central de Reserva de El Salvador (BCR)

Sin embargo, la reducción de la pobreza es un proceso complejo. De acuerdo a la última Encuesta de Hogares y Propósitos Múltiples (EHPM) de 2014, la pobreza a nivel nacional para ese año medida por ingreso incrementado y alcanzó un 31.8% de los hogares salvadoreños; de estos el 7.6% se encontraba en pobreza extrema; mientras que el 24.3% están en pobreza relativa. Tendencia similar se presenta en la medición por medio de los índices de pobreza multidimensional, este indica que para el 2014 el país tiene 606 mil familias que viven en pobreza, es decir un 35,2% de hogares salvadoreños. Datos que evidencian la difícil tarea de la lucha contra la pobreza que enfrenta el país.

El país debe entonces realizar importantes esfuerzos para enfrentar el histórico rezago social, que se agudiza ante la creciente vulnerabilidad climática y el ciclo de bajo crecimiento económico, sumado a la problemática de violencia e inseguridad social, que amenazan el desarrollo social y económico y afectan negativamente la calidad de vida de la población.

Considerando lo anteriormente expuesto, la agenda climática del país respecto a la mitigación y la emisión de GEI refleja que El Salvador en cuanto a sus niveles de emisiones, tanto en términos porcentuales (0.04% de las emisiones globales) como per-cápita (1.1 ton), tiene una contribución no significativa. En ese sentido, los compromisos que el país asuma deben estar equilibrados acorde a su nivel de responsabilidad. No obstante ello, el país está comprometido con el esfuerzo internacional para abatir los niveles de emisiones de gases de efecto invernadero (GEI) y se encamina a implementar un modelo de desarrollo bajo en emisiones, tal como se ha establecido dentro de su Plan Nacional de Cambio Climático. La promoción de la eficiencia energética y el impulso a las energías renovables, y la preparación de condiciones para ello, serán dos elementos esenciales de esta Contribución Prevista en materia de mitigación, tal como ha sido establecido en el Plan Quinquenal de Desarrollo 2014-2019.

2. Desarrollo Sostenible, prioridades nacionales ante el cambio climático.

2.1. Marco de prioridades Nacionales

La vulnerabilidad e impactos sobre el desarrollo socioeconómico descritos requieren de acciones claves y urgentes. En ese sentido, El Salvador en su objetivo 7 del Plan Quinquenal de Desarrollo 2014-2019, establece que el país debe “Transitar hacia una economía y una sociedad ambientalmente sustentables y resilientes al cambio climático”.

En esa misma línea, el Plan Nacional de Cambio Climático, elaborado y aprobado en el 2015, ratifica y define la orientación de las políticas, acciones y prioridades de cambio climático en materia de las contribuciones pretendidas nacionalmente determinadas. Consecuentemente, el país ha iniciado el proceso de elaboración del Plan Nacional de Adaptación (NAP, por sus siglas en inglés) de la Convención, que es un instrumento fundamental como extensión del Plan Nacional de Cambio Climático y ya se cuenta con un borrador para el diseño de una hoja de ruta para ello de aquí al 2017.

Como requisito para el proceso de planificación y la implementación de acciones prioritarias, El Salvador busca utilizar todas las oportunidades disponibles para el desarrollo de la capacidad institucional y técnica para la integración de la adaptación en el desarrollo sostenible, incluyendo programas de comunicación y sensibilización sobre el cambio climático y educación del público.

Además, el país ha constituido como ente coordinador a nivel político al Gabinete de Sustentabilidad Ambiental y Vulnerabilidad, el cual cuenta con el Consejo Nacional de Sustentabilidad Ambiental y Vulnerabilidad (CONASAV) como brazo asesor, promoviendo con ello la representación y participación de

sociedad civil, empresa privada, la academia y ONGs. Este marco institucional vendrá ser fortalecido por medio de una Ley Marco de Cambio Climático que establecerá los arreglos institucionales necesarios para la apropiada y sostenida gestión de la CPND.

Como se ha señalado previamente, los recursos hídricos, la agricultura, la infraestructura vial, la salud y el desarrollo del turismo se están viendo crecientemente afectados por el cambio climático, por lo que resulta fundamental definir un marco estratégico de actuación que permita identificar y poner en marcha las acciones prioritarias de adaptación al cambio climático en esos sectores. Las pretendidas acciones, compromisos y contribuciones nacionales en cada uno de estos sectores buscan ser sinérgicas, asegurando que cada intervención reporte co-beneficios sustantivos en los restantes.

En el contexto de esta CPND y como prioridades dentro de esta contribución se definen acciones relativas al fortalecimiento del marco legal, institucional y desarrollo de capacidades en los sectores de infraestructura, recurso hídrico, agricultura, salud y energía.

Por la propia naturaleza de las contribuciones nacionales, muchas de las acciones descritas trascienden la esfera de actuación del Gobierno y requieren del involucramiento y compromiso pleno de la sociedad y de todos los actores clave, que incluyen municipalidades, empresa privada, pequeños productores, ONGs, instituciones autónomas, comunidades, academia, etc.

2.2. Adaptación

La variabilidad en la precipitación tiene un fuerte impacto en la disponibilidad y calidad del agua, tanto superficial como subterránea, afectando directamente los diferentes usos del recurso especialmente el consumo humano y los ecosistemas, la producción agrícola, la generación de electricidad, y la economía en general, con implicaciones para la productividad y competitividad del país. Asimismo, impacta severamente y de diversos modos al sector salud, relacionándose con diferentes tipos de enfermedades, entre ellas morbi-mortalidad por estrés térmico, enfermedades diarreicas agudas (EDAs) por contaminación de aguas agravada por efecto de inundaciones, infecciones respiratorias agudas (IRAs) y enfermedades por vectores, agravadas también por las altas temperaturas. Las altas temperaturas incrementan además las plagas en las cosechas (incluyendo la Roya), las aguas cálidas frente a las costas generan reducción en la pesca, y los pastos secos impactan la ganadería. Por otra parte, las lluvias intensas y súbitas y tormentas eléctricas violentas acompañadas de vientos rafagosos, ocasionan también daños en la agricultura e infraestructura de las ciudades, ocasionando incluso pérdidas de vidas humanas.

El Salvador ha recurrido a estrategias sectoriales de adaptación con énfasis en agricultura, recursos hídricos, infraestructura y salud, contenidas en la Estrategia Nacional de Cambio Climático y en el Plan Nacional de Cambio Climático. Los recursos hídricos, la agricultura, infraestructura vial, la generación de energía, la salud y el turismo, entre otros; se están viendo crecientemente afectados por el cambio climático, por lo que resulta fundamental poner en marcha acciones prioritarias, bajo un enfoque holístico que integre la necesidad de ordenamiento y transformación en otras actividades y funciones que impactan, adversamente en estos sectores e incrementen su resiliencia. El Plan Nacional de Cambio Climático, es la base para esta articulación de acciones intersectoriales y para la formulación de esta CPND. Su elaboración ha contado con un importante proceso de consulta iniciado en julio de 2015.

2.3. Daños y Pérdidas

Los impactos y afectación generados por fenómenos asociados al cambio climático en el país son tan severos que comprometen la viabilidad inmediata y futura del desarrollo del país, el Fondo Monetario

Internacional, en el informe de su Misión de Consulta al país, marzo de 2013, concluyó que “Tras la crisis de 2008 – 2009, la economía salvadoreña ha crecido lentamente como resultado de la baja inversión doméstica y, el impacto de choques climáticos”.

En este sentido, la CPND prioriza el apoyo a las políticas fiscales, de protección social, sectoriales y territoriales. El Salvador, por tanto, considera necesario el desarrollo de mecanismos para enfrentar pérdidas y daños recurrentes por el cambio climático, de acuerdo a lo previsto para esta materia dentro del Plan Nacional de Cambio Climático y adoptando el marco de trabajo que en esta materia se establezca en los acuerdos bajo la Convención.

2.4. Mitigación

El Plan Quinquenal de Desarrollo 2015-2019 (PQD) ha establecido entre sus objetivos y líneas de acción promover la eficiencia energética, impulsar las energías renovables, controlar las emisiones del sector transporte y las asociadas a desechos y vertidos. Las contribuciones previstas en estas áreas reportan simultáneamente beneficios económicos y sociales que robustecen las condiciones nacionales para el desarrollo sostenible resiliente y bajo en carbono.

En ese sentido, un desarrollo urbano bajo en carbono para El Salvador no solo desaceleraría las emisiones de GEI sino que mejoraría las condiciones de competitividad económica de los núcleos urbanos y reduciría la incidencia de enfermedades asociadas con la contaminación y el fenómeno de islas de calor en las ciudades, mejorando la calidad de vida y el confort urbano.

Como ampliación de las directrices establecidas en el PQD, el Plan Nacional de Cambio Climático, establece como uno de sus ejes prioritarios el desarrollo urbano y costero resiliente al clima y bajo en carbono, incluyendo en su implementación el desarrollo de Acciones Nacionales Apropriadas de Mitigación (NAMAs, por sus siglas en inglés). En las acciones de restauración de ecosistemas y paisajes, de implementación del Programa REDD plus, así como adaptación de la agricultura al cambio climático se desarrollan simultáneamente co-beneficios de mitigación cuantificables en muchos casos.

Es fundamental que estos esfuerzos para implementar las contribuciones nacionales en materia de mitigación para el cumplimiento de los compromisos del país ante el acuerdo 2015, cuenten con el concurso de los actores económicos y del conjunto de la sociedad. Es imprescindible consensuar metas y compromisos y será necesario contar con el apoyo técnico y financiero proveniente de recursos internacionales públicos y privados, nuevos y adicionales a la ayuda oficial al desarrollo y que se correspondan con el principio de responsabilidades comunes pero diferenciadas establecido por la Convención.

3. Contribuciones Previstas Nacionalmente Determinadas prioritarias para enfrentar los impactos observados y mitigar el cambio climático.

Las contribuciones nacionalmente determinadas podrán ser incondicionales o condicionadas a la disponibilidad apropiada de medios de implementación suministrados a través de los mecanismos existentes dentro de la Convención Marco de Naciones Unidas sobre Cambio Climático o por medio de apoyos recibidos de otras fuentes bilaterales o multilaterales.

En ese sentido, las contribuciones nacionales planteadas serán posibles siempre y cuando se cuente con el siguiente conjunto de condiciones para su implementación tales como:

a) El país mantiene una estabilidad macroeconómica y una tendencia positiva de crecimiento económico y de reducción de la pobreza.

- b) Existan los recursos financieros internacionales disponibles para apoyar los compromisos mencionados, los cuales deberán ser nuevos y adicionales a la ayuda oficial al desarrollo; asegurando no solo el fortalecimiento de las capacidades nacionales sino también el acceso adecuado a tecnologías, entre otro tipo de cooperación
- c) No se presente en el país en los próximos años un evento climático extremo asociado al cambio climático que provoque pérdidas y daños y obligue a orientar recursos financieros para la atención del mismo y que a la vez, limiten la disponibilidad de recursos propios para apoyar las CPND.
- d) No enfrentemos un suceso de impacto nacional que afecte directamente la asignación de recursos financieros públicos, restando financiamiento a temas priorizados para el país como educación, salud y seguridad.
- e) Se facilite por medio de los mecanismos que establezca la Convención el acceso a tecnologías más eficientes y costo efectivas que contribuyan a alcanzar la reducciones de emisiones GEI propuestas en las CPND

3.1. Fortalecimiento del marco Institucional y legal para la formulación e implementación sostenida de las CPND de El Salvador: Preparación, adopción y entrada en vigencia de una Ley Marco de Cambio Climático antes de 2019.

Los desafíos del cambio climático para el país son de tal magnitud que toda la economía nacional, dependiente del abastecimiento seguro y accesible de agua y energía, de insumos agrícolas, de infraestructura eficiente y segura y de una fuerza laboral sana, educada y capacitada, se ve seriamente amenazada por los impactos crecientes de eventos extremos y por los de lento desarrollo que ya reportan riesgo de inviabilidad, baja productividad y limitada competitividad en algunos rubros de la actividad económica, empezando por algunos cultivos que sustentan la dieta básica alimentaria nacional.

De igual manera, el país se encuentra próximo a la condición de estrés hídrico, estando bajo creciente amenaza el abastecimiento de agua para cubrir las necesidades humanas básicas a nivel urbano y rural. La demanda creciente y la disminución en la disponibilidad del recurso están llevando al uso más intenso de las fuentes superficiales de agua, incluso de algunas con alto grado de contaminación que requerirán elevadísimos costos para su potabilización, como es el caso con la del lago de Ilopango. En tales circunstancias y frente al horizonte que presenta al país el cambio climático, es impostergable la disposición de marcos legales y regulatorios que respondan efectivamente a esta nueva realidad nacional y global, que han de comprometer la acción solidaria y conjunta de todos los sectores de la vida nacional.

La Ley Marco de Cambio Climático, que entrará en vigencia antes de 2019 especificará las atribuciones y responsabilidades de todas las entidades del Estado, de todos los sectores de la actividad económica, de la academia y de la ciudadanía en general para responder a este desafío. La misma ley reconocerá, institucionalizará y dispondrá las medidas pertinentes para facilitar la implementación obligatoria de todas las acciones o compromisos que el país acuerde y asuma frente al nuevo acuerdo a adoptarse en París, mediante apropiados procesos de consulta y consenso, en materia de contribuciones nacionalmente determinadas en adaptación y mitigación del cambio climático.

La Ley dispondrá lo apropiado para que las normativas que regulan la gestión de los sectores agrícola, acuícola, forestal, hídrico, energía, infraestructura, salud, educación, construcción, desarrollo urbano

y transporte y turismo sean actualizadas y armonizadas de acuerdo con sus principios y objetivos de adaptación y mitigación del cambio climático. La actualización de éstas podrá emprenderse de manera paralela al proceso de formulación y aprobación de la Ley Marco de Cambio Climático. Dicha actualización incluirá un apartado especial relativo la responsabilidad de cada sector para preparar regularmente las contribuciones sectoriales con que cada sector aportará a las contribuciones nacionales que el país presentará periódicamente ante la Convención y su nuevo acuerdo. Asimismo, dispondrá los mecanismos apropiados para el monitoreo de la implementación y el reporte de resultados.

Esta ley dispondrá los arreglos institucionales apropiados para la formulación y supervisión de la implementación eficaz de los planes nacionales de cambio climático y de las contribuciones nacionalmente determinadas que el país elabore, la supervisión de su implementación y los mecanismos para su reporte ante la Convención.

Asimismo dispondrá los mecanismos necesarios y específicos de coordinación interinstitucional para mantener la divulgación de la información generada por las instituciones en la preparación de las contribuciones nacionales y las acciones de respuesta los diferentes fenómenos climáticos. Para este efecto, es necesario mejorar el marco institucional y desarrollo de capacidades mediante las acciones al efecto previstas en el Plan Nacional de Cambio Climático. Entre éstas:

- Formación de recurso humano.
- Mejora de la articulación interinstitucional e intersectorial.
- Mejora del flujo de la información y transparencia entre las instituciones gubernamentales y autónomas.
- Fomento de la transferencia de tecnología
- Actualización curricular en la academia.
- Crear un dialogo de país sobre la temática de Cambio Climático.
- Revisar y ajustar de manera permanente el marco legal en materia de Cambio Climático, acorde con las circunstancias cambiantes que esa realidad impone.
- Fortalecer la aplicación de leyes.

3.2. Ley de Ordenamiento y Desarrollo Territorial. Implementación efectiva de esta Ley antes de 2018, como instrumento habilitante de cumplimiento de las acciones y contribuciones nacionales en adaptación y mitigación y para el control del cambio de uso del suelo.

3.3. Infraestructura: Actualización de la Ley Urbanismo y Construcción, Ley de Desarrollo y Ordenamiento Territorial del Área Metropolitana de San Salvador y de normas y reglamentos de construcción antes de 2019.

La adaptación y la mitigación del cambio climático son elementos esenciales para la adecuada planificación del desarrollo urbano y de la infraestructura, en función del crecimiento económico y el desarrollo humano. Y sin planificación de tales desarrollos no es posible disponer e implementar medidas apropiadas de adaptación y mitigación en función del desarrollo social y del crecimiento económico sostenible.

Las pérdidas y daños experimentados en los últimos años resaltan, además, la necesidad en invertir en una infraestructura resiliente a los impactos del cambio climático, para salvar vidas y proteger el capital de la nación. Para este efecto es necesario:

- Cambio de paradigmas para una innovación tecnológica en la construcción con co-beneficios en mitigación y adaptación.
- Promoción de la arquitectura bioclimática y vernácula apropiada para los diferentes tipos de infraestructura (suministro de servicios básicos como agua, vivienda, redes viales, electrificación, etc.)
- Densificación de la vivienda (privilegiar vivienda en altura, atendiendo a las circunstancias culturales para su logro).
- Blindaje, coaseguros, transferencia del riesgo con opciones apropiadas para los diferentes tipos de infraestructura, según lo previsto dentro del Plan Nacional de Cambio Climático.
- Crear incentivos y sistemas comunitarios para reducir el alto costo de eco-eficiencia, sobre todo en las clases socioeconómicas de bajos ingresos para la mejora del confort térmico en viviendas y oficinas (arquitectura bioclimática, eficiencia energética, microclima, islas de calor).

- 3.3.1. El Consejo de Desarrollo Metropolitano (CODEMET) desarrollará y presentará antes del 2018 un plan inicial de adaptación del Área Metropolitana de San Salvador como parte de la contribución nacional al primer periodo de implementación del acuerdo 2015, estableciendo el porcentaje asociado de reducción de emisiones al 2025 con relación a una trayectoria de no acción o BAU (“business as usual”). El Plan establecerá las necesidades asociadas de financiamiento, transferencia tecnológica y desarrollo de capacidades para su implementación.
- 3.3.2. El Salvador elaborará antes del 2019, un plan director para una gestión sustentable de las aguas lluvias en el Área Metropolitana de San Salvador, con enfoque de cuenca y énfasis en la reutilización del agua. El Plan establecerá las necesidades asociadas de financiamiento, transferencia tecnológica y desarrollo de capacidades para su implementación.
- 3.3.3. En el periodo 2018-2025, El Salvador ejecutará inversiones en lagunas de laminación para el control de inundaciones del Área Metropolitana de San Salvador, con restauración ambiental y social de espacios. Para el cumplimiento de la meta se establecerán los necesarios medios de implementación que estuvieran fuera del alcance de las finanzas nacionales
- 3.3.4. El Salvador continuará ejecutando su plan masivo de obras de protección en todo el país, con restauración ambiental y social de espacios.
- 3.3.5. El Salvador antes del 2018 elaborará el diagnóstico de medidas estructurales y no estructurales relacionadas con infraestructura para la adaptación al cambio climático de áreas urbanas (caso de estudio Área Metropolitana de San Salvador)
- 3.3.6. En el período 2018 – 2025 El Salvador habrá puesto en marcha la segunda etapa o fase del Sistema Integrado de Transporte del Área Metropolitana de San Salvador (SITRAMSS) cubriendo su eje norte - sur, desarrollando un componente masivo de sensibilización social que asegure el involucramiento ciudadano para que el mismo alcance su máximo potencial de reducción de emisiones. El Viceministerio de Transporte presentará los estudios técnicos con la estimación cuantitativa de ese potencial. Para el cumplimiento de la meta se establecerán los necesarios medios de implementación que estuvieran fuera del alcance de las finanzas nacionales.

3.4. Recursos Hídricos: El Salvador promoverá la implementación efectiva de un marco normativo para la gestión integrada de los recursos hídricos antes de 2017.

La variabilidad climática hace del recurso hídrico un área de importancia transversal. Los eventos de exceso o de falta de lluvia requieren de una estrategia de gestión integrada con ejes que comprenden todos los ámbitos de la sociedad salvadoreña. Las leyes y normas que regulan el uso del recurso en distintos sectores se actualizarán de acuerdo y función del cumplimiento de los objetivos de la misma.

La gestión integral y sostenible del recurso, incluye la protección, conservación y recuperación de sus fuentes, superficiales y subterráneas; reconocimiento del derecho humano al agua, su uso justo y distribución racional y equitativa en base a una jerarquía de prioridades, siendo el acceso y uso humano del agua la primera y principal. El marco normativo incluirá la obligación de presentar en cada ciclo de implementación del nuevo acuerdo de cambio climático contribuciones nacionales de adaptación y mitigación del sector hídrico, disponiendo para ello de los arreglos institucionales encargados de su preparación, verificación de implementación y reporte.

- 3.4.1. En el período 2021 - 2025 El Salvador reducirá en un 20% las pérdidas de agua no facturada registrada a nivel urbano en el año 2015, asegurando una gestión más eficaz y eficiente del agua y la mejora en el acceso justo, equitativo y seguro de todos los sectores poblacionales. Para el cumplimiento de la meta se establecerán los necesarios medios de implementación que estuvieran fuera del alcance de las finanzas nacionales.
- 3.4.2. En el periodo 2021 – 2025 El Salvador pondrá en marcha la protección y restauración mediante planes apropiados de gestión, del 70% de las principales zonas de recarga acuífera identificadas en el Plan Nacional de Gestión Integrada de los Recursos Hídricos. Para el cumplimiento de la meta se establecerán los necesarios medios de implementación que estuvieran fuera del alcance de las finanzas nacionales.
- 3.4.3. En el período 2021 – 2025 El Salvador mantendrá el sistemas de monitoreo y gestión sostenible de todos los acuíferos costeros. Para el cumplimiento de la meta se establecerán los necesarios medios de implementación que estuvieran fuera del alcance de las finanzas nacionales.
- 3.4.4. En el período 2021 – 2025 El Salvador ejecutará tres obras de infraestructura hidráulica de importancia nacional para la conservación de agua y regulación de caudales, de acuerdo a las necesidades identificadas en el Plan Nacional de Gestión Integrada de los Recursos Hídricos. Para el cumplimiento de la meta se establecerán los necesarios medios de implementación que estuvieran fuera del alcance de las finanzas nacionales.
- 3.4.5. En el periodo 2018 – 2025 El Salvador pondrá en marcha el proceso de descontaminación de los ríos Acelhuate, Sucio, Suquiapa y Grande de San Miguel. Para el cumplimiento de la meta se establecerán los necesarios medios de implementación que estuvieran fuera del alcance de las finanzas nacionales. En el logro de la meta se identificarán e implementarán tecnologías y procesos de participación ciudadana, principales actores sociales y del sector privado que promuevan la mayor reducción de emisiones asociadas.

3.5 Agricultura, ganadería y silvicultura. Las Políticas y leyes vigentes relacionadas con la regulación de la actividad de estos sectores serán revisadas, actualizadas antes de 2019.

Por la importancia de estos sectores para la economía, la seguridad hídrica y alimentaria de El Salvador y la necesidad de reducir la vulnerabilidad de los mismos al cambio climático, se requieren acciones

urgentes para que estos continúen siendo económicamente viables bajo los escenarios previsibles de cambio climático.

El objetivo bajo esta contribución es reducir la vulnerabilidad de los sectores y la adaptación al cambio climático y promover los co-beneficios asociados de mitigación. En el proceso de revisión y actualización de las leyes sectoriales pertinentes se dispondrán de los arreglos institucionales y mecanismos apropiados para la formulación periódica, implementación y reporte de la contribución de dichos sectores a las Contribuciones Nacionalmente Determinadas que el país presentará regularmente, según los ciclos convenidos, en el acuerdo de París.

La Estrategia Ambiental de Adaptación y Mitigación al Cambio Climático del Sector Agropecuario, Forestal, Pesquero y Acuícola 2015, y sus planes de implementación asociados, como el Plan de Agricultura Familiar, serán actualizados cada cinco años. La Estrategia 2015 y todas las ulteriores establecerán un apartado específico de elaboración e implementación de contribuciones nacionalmente determinadas, con los recursos disponibles y necesidades adicionales para su plena ejecución, a reflejarse en su planes concretos de acción, contemplando como mínimo: áreas definidas del territorio nacional en donde serán ejecutadas, de acuerdo a prioridades nacionales, incluyendo el establecimiento de metas cuantificables de transformación de la agricultura tradicional a agricultura sostenible, identificando los recursos necesarios para ello, así como la estimación de la reducción de emisiones de GEI asociadas. Esta transformación comprenderá, entre otros elementos, el desarrollo y difusión de la agroforestería y la progresiva e irreversible reducción del uso de agro-químicos.

3.5.1. El Salvador presentará antes de la COP 22, metas cuantificables de transformación de su agricultura tradicional para el período 2021- 2025. Para el cumplimiento de la meta se establecerán los necesarios medios de implementación necesarios que estuvieran fuera del alcance de las finanzas nacionales.

3.5.2. Para 2030, El Salvador establecerá y manejará un millón de hectáreas a través de “Paisajes Sostenibles y Resilientes al Cambio Climático”. Se trata de un abordaje integral de restauración de paisajes, donde se rehabilitarán y conservarán las zonas boscosas, se establecerán corredores biológicos mediante la adopción de sistemas agroforestales resilientes y transformación de las zonas agrícolas con prácticas sostenibles bajas en carbono, y buscando la Neutralidad en la Degradación de las Tierras. En este marco, se conservará la cobertura arbórea actual – 27% del territorio – manteniendo las áreas naturales, incluido los manglares, los sistemas agroforestales y las plantaciones forestales existentes. Además, se mejorarán las reservas forestales de carbono, incrementando la cobertura en 25% del territorio, con sistemas agroforestales y actividades de reforestación en áreas críticas, como bosques de galería, zonas de recarga acuífera, y zonas propensas a deslizamiento. Para el cumplimiento de estas metas se establecerán los necesarios medios de implementación que estuvieran fuera del alcance de las finanzas nacionales.

3.5.3. El Salvador presentará antes de la COP 22, metas cuantificables de erradicación de la práctica de la quema de caña y de transición hacia su cultivo sostenible y certificado para el período 2021 – 2025.

3.5.4. El Salvador presentará antes de la COP 23 un plan de diversificación de la agricultura y la actividad económica para la zona oriental del país, a implementarse en el período 2018 – 2025, para impulsar su resiliencia a los efectos adversos del cambio climático y orientar su desarrollo

bajo en carbono. Para el cumplimiento de sus metas se establecerán los necesarios medios de implementación que estuvieran fuera del alcance de las finanzas nacionales.

3.6. Energía. Actualización del marco legal relacionado y de la Política Energética Nacional.

La legislación y marcos regulatorios serán revisados y actualizados con el fin de promover el máximo aprovechamiento de las energías renovables a todas las escalas, siguiendo para ellos criterios de máxima eficiencia y relación costo-beneficio. Del mismo modo, se dispondrán o actualizarán las normativas para maximizar el ahorro y la eficiencia energética.

La Política Energética Nacional 2010-2024, y toda futura política energética nacional promoverán la diversificación de la matriz energética del país, priorizando y disponiendo todos los medios al alcance para impulsar el desarrollo y uso generalizado, a todas las escalas, de las energías renovables. Con el objetivo de alcanzar esa diversificación, sin generar estímulos al uso o empleo de fuentes de energía que sean más contaminantes que las que el país ha utilizado hasta el año 2015.

3.6.1. Antes de la COP 22, el sector de generación de energía definirá una meta de reducción de emisiones de GEI con respecto a un crecimiento sin acciones concretas de mitigación o “business as usual” (BAU) para el año 2025.

3.6.2. Antes de la COP 22, el sector de generación de energía definirá y alcanzará una meta de reducción de emisiones de GEI para el año 2025, a través de implementación de procesos y medidas de eficiencia energética; o bien, definirá porcentajes de mejora de la eficiencia energética a nivel sectorial con respecto a una línea de base establecida para el año 2010, con relación a un escenario sin acciones concretas de aumento de eficiencia para el año 2025. La propuesta presentará necesidades de recursos de implementación fuera del alcance de las finanzas nacionales.

3.6.3. Antes de la COP 22 el sector de generación hidroeléctrica presentará un plan con metas a alcanzarse en el período 2021 – 2025, para la restauración y adaptación al cambio climático de las cuencas de las principales represas del país y para la mejora de la resiliencia de la infraestructura hidroeléctrica. La propuesta presentará necesidades de recursos de implementación fuera del alcance de las finanzas nacionales.

3.6.4. Antes de la COP 22 el sector de generación de energía eléctrica definirá y se comprometerá con una meta de incremento de energía renovable para el año 2025 no inferior al 12% con respecto a la energía eléctrica total generada en el país en el año 2014. La propuesta presentará necesidades de recursos de implementación fuera del alcance de las finanzas nacionales.

3.7. Salud, Saneamiento Ambiental, Trabajo y Previsión Social y Transporte. Los sectores de salud, saneamiento ambiental, trabajo y previsión social y transporte revisarán y actualizarán su legislación respectiva con el fin de adecuarla a las circunstancias y amenazas que presenta el cambio climático.

3.7.1. Dichos sectores, en coordinación con las municipalidades concernidas, presentarán antes del 2018 un plan integrado de adaptación en materia de salud, seguridad laboral y alimentaria y nutricional a implementarse en el período 2018 – 2025, con metas concretas para la reducción de la contaminación ambiental y aumento de resiliencia al cambio climático en los principales centros urbanos del país, territorios y población vulnerable. El Plan presentará las necesidades de recursos de implementación fuera del alcance de las finanzas nacionales.

3.7.2. El Salvador presentará antes de la COP 22 un plan de reducción de emisiones de todos sus rellenos sanitarios a implementarse entre 2018 y 2025. El plan presentará la estimación de las emisiones a reducir con respecto a una trayectoria sin acción de mitigación (BAU) y las necesidades de medios de implementación fuera del alcance de las finanzas nacionales.

3.7.3. El Salvador presentará antes de la COP 22 una normativa para mejorar la calidad del combustible diésel servido en el país, a implementarse a partir de 2018.

3.7.4. El Salvador durante el periodo 2018-2025, promoverá una movilidad limpia en el Área Metropolitana de San Salvador, incorporando gradualmente motores menos contaminantes y el impulso de una estrategia de desarrollo de ciclo rutas, que incluya la sensibilización a la población

3.7.4. El Salvador presentará antes de la COP 23 una propuesta para mejorar y mantener, de manera sostenida, la calidad del parque vehicular privado, del transporte público y de carga, con metas definidas para 2025. La propuesta presentará las necesidades de recursos de implementación fuera del alcance de las finanzas nacionales.

3. Medios de implementación

Los medios de implementación se refieren a los instrumentos y mecanismos de apoyo necesarios para alcanzar la aspiración del país y contribuir a las prioridades de adaptación y de mitigación acorde a los compromisos que establezca el acuerdo global 2015.

El Salvador, difícilmente puede hacer frente a las CNPD sin apoyo externo dados los recursos limitados de los que dispone y ante la necesidad de cubrir los déficits sociales y los efectos ya presentes del cambio climático. El apoyo externo es un elemento fundamental para impulsar las medidas relacionadas con el cambio climático, y que condicionan diversas metas propuestas en su Contribución Prevista. Por lo tanto, esta CPND podrá actualizarse a la luz del acuerdo de París, particularmente en lo que aplique al apoyo financiero y de transferencia tecnológica.

Por lo tanto, El Salvador ratifica para efectos de cumplir con las CPND el artículo 4.7 de la Convención Marco, “La medida en que los países en desarrollo lleven a la práctica efectivamente sus compromisos en virtud de la Convención dependerá de la manera en que las Partes que son países desarrollados lleven a la práctica efectivamente sus compromisos relativos a los recursos financieros y la transferencia de tecnología, y se tendrá plenamente en cuenta que el desarrollo económico y social y la erradicación de la pobreza son las prioridades primeras y esenciales de las Partes que son países en desarrollo”.

Considerando los factores y condiciones antes citados, El Salvador requiere para la implementación de las Contribuciones Previstas acceso efectivo a mecanismos de financiamiento como el Fondo Verde del Clima (GCF por sus siglas en inglés) y mecanismos tecnológicos tales como el Centro y Red de Tecnología del Clima (CTCN por sus siglas en inglés)

El país cuenta con instrumentos para canalizar recursos nacionales e internacionales necesarios para promover las Contribuciones Previstas Nacionalmente Determinadas y todos los esfuerzos encaminados a promover la resiliencia y el desarrollo bajo en carbono. El Salvador, estará explorando la adopción de modalidades de gestión de recursos, tales como Canje de Deuda por Adaptación al Cambio Climático para apoyar las prioridades nacionales y otro tipo de mecanismos que le permitan canalizar los recursos adicionales para enfrentar sus compromisos.



The State of Eritrea

Eritrea's Intended Nationally Determined Contributions (INDCs) Report

**September 2015
Asmara, Eritrea**



THE STATE OF ERITREA
Ministry of Land, Water & Environment

Foreword

Eritrea is strongly convinced that much of the critical climate change problem that faces our Planet is attributable to human activities and it is a signatory to the UNFCCC. The ultimate objective of the Convention is to achieve the stabilization of greenhouse gas concentration in the atmosphere at a level recommended by science, in order to prevent dangerous anthropogenic interference with the global climate system.

The phenomenon of climate change has already reached a critical stage that is hard to ignore. In fact humanity has no other option but to abandon business as usual approach of production, use of natural resources and consumption. Nations have to cooperate to keep the cumulative global GHG concentration in the atmosphere within the allowable limit as recommended by science so as to mitigate climate change and its menacing impacts on life. The latest climate science indicates the total amount of emission reduction required to realise the likely chance of limiting global warming to less than 2°C, the goal adopted by the UNFCCC. To achieve this goal, global emissions must peak by 2020 and net GHG emissions must be phased out over the long term. This necessitates major emitters to make substantial reduction in their projected baseline business as usual emissions and all others to adopt sustainable path.

Eritrea upholds the basic principles of the Convention that require all parties to contribute to the protection of the global climate system on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. In line with this, Eritrea submits its INDC report to UNFCCC Secretariat in response to the call made under paragraph 14 of the Lima Call for Climate Action at UNFCCC 2014. The document, being an outcome of a concerted effort and wide consultative process of all stakeholders and technical experts involved in issues related to climate change, constitutes an expression of Eritrea's commitment to the objectives of UNFCCC as well as its resolve to streamline climate adaptation and mitigation to its national development strategy.

Tesfai Ghebresslassie Sebhatu

Minister of Land, Water and Environment

15 September 2015





Executive Summary

Eritrea had ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1995. Moreover, as follow up to the Warsaw proposal followed by the Lima call for climate action, Eritrea has prepared its Intended Nationally Determined Contribution (INDC) for the period 2020-2030 with the view that global determination to tackle the effects of climate change calls for commitment from all parties with regard to mitigation, adaptation and implementation.

In developing its INDC, Eritrea undertook a broad stakeholders representation and consultation processes. This process allowed for the baseline assessment, and review of policies and programs that are being implemented by the Government of the State of Eritrea to combat global warming and for the level of ambition to which the country wants to commit in its INDC.

In the mitigation, the main gases covered are CO₂, CH₄ and N₂O. Key sectors that contribute to the greenhouse gases emission are: Energy, Transport, Industry, Waste, Forestry and Agriculture. Vulnerable sectors to impacts of climate change that need adaption measures include Agriculture, Marine resources, Health, water and land resources.

In 2010, the total greenhouse gases emission estimated using the GACMO model amounts to ktCO₂ 3972, whereas, the business as usual scenario of GHGs emission in the year 2030 is expected to be ktCO₂ 6331.

The country focussing on the energy sector assumes two scenarios, in the mitigation of the greenhouse gases emission plans for the next 15 years: reducing by 39.2% unconditionally and 80.6 % in the conditional scenario assuming external assistance compared to the business as usual scenarios.

The INDCs also presents concrete measures and steps that need to be taken in the implementation the projects and programs. These include, capacity building, technology transfer, financial support and partnership with regional and international agencies involved in climate change.

To ensure effective implementation of the INDC program, M & E tools are proposed. This includes periodic monitoring of the activities stipulated in the project documents so as to verify the right direction towards the intended outcome in mitigation and adaption.



1. National Context

1.1 Rationale and Process for Developing INDCs

Eritrea is located in the Horn of Africa, lying between 12°22', and 18°02' north and between 36°26' and 43°13' east. Sudan borders it in the west, Ethiopia in the south, Djibouti in the south east, and the Red Sea in the east. The country has a total land area of 124,300 km², and a coast line of 1900km. Eritrea's territorial waters in the Red Sea zone is about 120,000 km².

It has diversified Eco geographic zones that provide unique habitat for the marine terrestrial fauna and flora. In 2010, the population of Eritrea was estimated to be 3.2 million with an annual population growth rate of 2.9%, comprising of 65% living in the rural areas. The economic activity, for most of the population, mainly relies on rain fed agriculture and artisanal fisheries.

Climatically 70% of the country is hot to very hot with annual mean temperatures of 27°C; 20% is mild with temperature of 19°C and the remaining 10% is cool with mean temperature of less than 19°C. Eritrea is vulnerable to climate change and both the marine and terrestrial ecosystems have been negatively affected. Over the past 60 years temperature has risen by approximately 1.7°C with tremendous impact on biodiversity losses, sea level rise and coral bleaching due to increase in sea water temperature, decline in food production, loss of biodiversity and overall loss of resilience of the ecosystem. Hence, the country plans to adapt climate smart technologies to counteract the adverse impacts of climate change, so as to improve the health and social wellbeing of the population.

Against the above background, the purpose of the preparation of the INDCs is to promote environmentally sound, socially acceptable and climate resilient economic development by following low-carbon development path and increasing adapting capacity to the adverse impacts of climate change.

Under paragraph 14 of the Lima Call for Climate Action, countries were invited to describe how their intended nationally determined contribution "contributes to the achievement of the objective of the Convention" (UNFCCC 2014). The latest climate science shows what needs to be happening globally in order to have a probably chance of limiting warming to 2°C, the goal adopted by the UNFCCC. Global emissions must peak by 2020, and net GHG emissions must be phased out over the Long term. This will require all major emitting regions to make substantial reductions below their projected baseline business-as-usual emissions over the course of this century. Cumulative global emissions must remain within the carbon budget, which is the maximum amount of cumulative carbon the world can emit to have a probably chance of limiting warming to 2°C.



1.2 Summary of climate change trends, impacts and vulnerabilities

The rainfall regime varies in space and time. It ranges from 50mm along the coastal area to 1000 mm in smaller area along the eastern escarpment; 50% of the country receive less than 300mm; 40% 300-600mm, and 10% greater than 600mm. Hence, by virtue of its geographical location, Eritrea is prone to climatic variability i.e. recurrent droughts, (decrease in amount of rainfall from 550 to 400mm in the highlands), changes in seasonality that had resulted frequent crop failure, massive death of livestock, genetic erosion, extinction of endemic species, degradation of habitats and disequilibria in the ecosystem structure and function.

The impact of climate change is manifested in recurrent droughts, desertification, sea level rise and increase in sea water temperature, depletion of ground water, widespread land degradation, and emergence of climate sensitive diseases. The combined net effect has resulted in **food insecurity**.

Eritrea is committed to gender equity and social justice. 30% of the National Assembly is composed of women.

Increased climate variability has already been evidenced in Eritrea. Eritrea has experienced frequent and recurrent droughts since the early 1920s which has aggravated food insecurity and poverty. The spread of malaria in the highlands, which has never been experienced before, desertification and decline in biodiversity have also been witnessed. A number of recent assessments have revealed that observed climate change already has serious impacts on socio-economic systems and livelihoods of the country.



1.3 Existing Policies and Legal Framework Related to Climate Change

As Shown in Table 1 Eritrea has already developed various macro and micro polices and legal instruments, plans, guidelines and communication documents which have important contribution to the adaptation and mitigation of climate change. Eritrea has prepared its INDC based on these national documents.

Table 1: list of national policies, strategies and legal frame works

National Policy Documents	Year
▪ Macro Policy, GOE	1994
▪ National Constitution, GOE	1997
▪ National Economic Policy Framework and Program (NEPFP), GOE	1998-2000
▪ Interim-Poverty Reduction Strategy Paper (I-PRSP), GOE	2003
▪ The Five Year Indicative Development Plan (FYIDP), GOE	2009
▪ Ten Year Long-Term Indicative Perspective Development Plan (TYIPDP), GOE	2009
Multi Focal Area / Cross-cutting	
▪ National Environmental Management Plan	1995
▪ National Environmental Assessment Procedures & Guidelines	1999
▪ National Agricultural Development Strategy and Policy	1994/2005 (draft)
▪ Forest and Wildlife Policy	2005
▪ Agriculture Sector Policy	2006
▪ Land Use Policy	2007
▪ Water Policy	2007
▪ Water Law, Proclamation No. 162,	2010
▪ National Health Policy	2010
▪ Integrated Water Resource Management Action Plan	2009
▪ Environmental Health Policy	1998
▪ Rural Sanitation Policy	2007
▪ Fishery Proclamation	2014
▪ Fisheries Product Proclamation	1998
Biodiversity	
▪ National Biodiversity Strategy and Action Plan (NBSAP)	1996, 2000, 2014
▪ Proclamation on Conservation of Biodiversity	1998
▪ Forest and Wildlife Conservation and Development Proclamation No. 155	2006
Climate Change and Energy	
▪ Renewable Energy Sub-Sector Policy	1997
▪ National Adaptation Program of Action	2007
▪ Second National Communication (SNC)	2012
Land Degradation	
▪ Land Proclamation No.58	1994
▪ Land Use Planning Regulatory Framework	1999
▪ National Action Program	2002
▪ Five Year Action Plan for The Great Green Wall Initiative (Draft)	2011-2015



2. National Development Goals and Priorities

Eritrea intends to undertake mitigation and adaptation initiatives to reduce the vulnerability of its population, environment and economy to the adverse effects of climate change, based on its Climate Resilient Sustainable Economy Development policy for addressing both climate change adaptation and mitigation goals. This would ensure a resilient economic development pathway and in the long run, Eritrea envisages achieving its goals of becoming climate change responsive country with equitable economic growth by ensuring a rapid transition to low-carbon economy.

To this end, Eritrea intends to raise the share of electricity generation from renewable energy to 70% of the total electricity generation mix (wind, solar and geothermal). Moreover it intends to reduce transmission and distribution losses at least by 50%. On the other hand to enhance energy conservation it is intended to introduce: rail transportation to cover about 400km for mass transportation of freight with estimated cost of about USD 1billion and uses of big buses for passenger transport to a long distance.

3. Eritrea's Mitigation Contributions

3.1 Mitigation Measures

3.1.1 Base year

2010

3.1.2 Target Year

2030

3.1.3 Gases Covered

Carbon dioxide (CO₂), Methane (CH₄), and Nitrous Oxide (N₂O)

3.2 Geographical and Sectoral Coverage

Geographical coverage includes all territories of Eritrea and most sectors are covered in the contribution of the greenhouse Gases (GHG) reduction. Climate mitigation actions are proposed mainly in energy, industry, transport, forestry, agriculture (Crop and livestock) and waste sectors. Table 2 provides a summary of Eritrea's mitigation options proposed in different sectors and sub sectors.



Table 2: Eritrea Sectoral Coverage under the mitigation measure

Conditional GHG reduction options	Emission reduction in 2030 per option kt/year	Conditional GHG reduction options	Emission reduction in 2030 per option kt/year
Cogeneration in industry	31.16	Solar LED lamps	2.75
Waste heat recovery at cement plant	61.56	Assisted forest regeneration	391.88
Efficient domestic lighting with CFLs	39.11	Biogas at big farms	28.10
Efficient domestic lighting with LEDs	60.03	Composting of Municipal Solid Waste	12.12
Geothermal power	315.00	Biodiesel from MSW	107.11
Wind turbines, on-shore	155.00	Efficient wood stoves	488.15
Efficient residential air-conditioning	18.07	Biogas at rural farms	45.10
Efficient office lighting with CFLs	3.30	Charcoal production	14.10
Efficient electric stoves	17.25	Clinker replacement	167.90
Efficient street lights	24.21	LPG stoves replacing wood stoves	232.31
Solar PVs, large grid	127.29	Efficient electric grids	58.80
Efficient refrigerators	26.37	Reforestation	1.98
Restriction on import of used cars	27.94		
Total		3048	

3.3 Trajectory Objective Towards 2030

The government of the State of Eritrea is committed to reduce the CO₂ emissions from fossil fuels by 23.1% in 2020, 30.2 % by 2025 and 39.2% by 2030 visa-vis to the reference year. If additional support is solicited, it can be further reduced by 36.4 % in 2020, 61.1% by 2015 and 80.6% by 2030.

The BAU scenario for all GHG gases expected to increase to: 5 MtCO₂eq in 2020, 5.5 MtCO₂eq in 2025 and in 2030 6.3 MtCO₂eq. Therefore, Eritrea intends to limit its net greenhouse gas (GHGs) emissions in 2030 to less than 3.9 MtCO₂eq. This would constitute a 39% reduction from the projected 'business-as-usual' (BAU) emissions in 2030 or 80.6% reduction from the reducible BAU scenario in 2030 as shown in Figure 1.

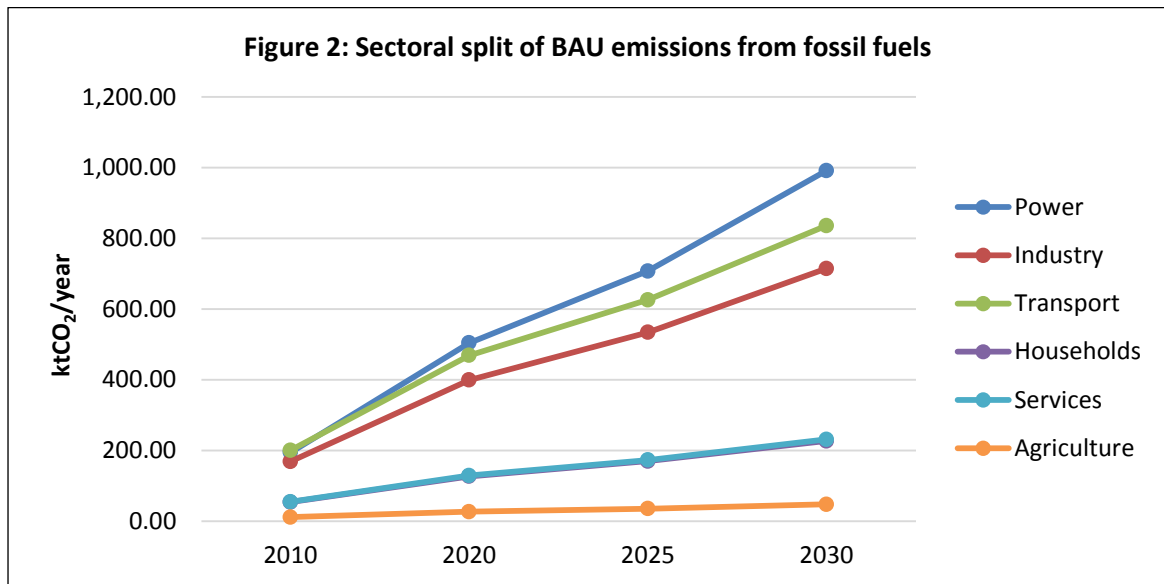
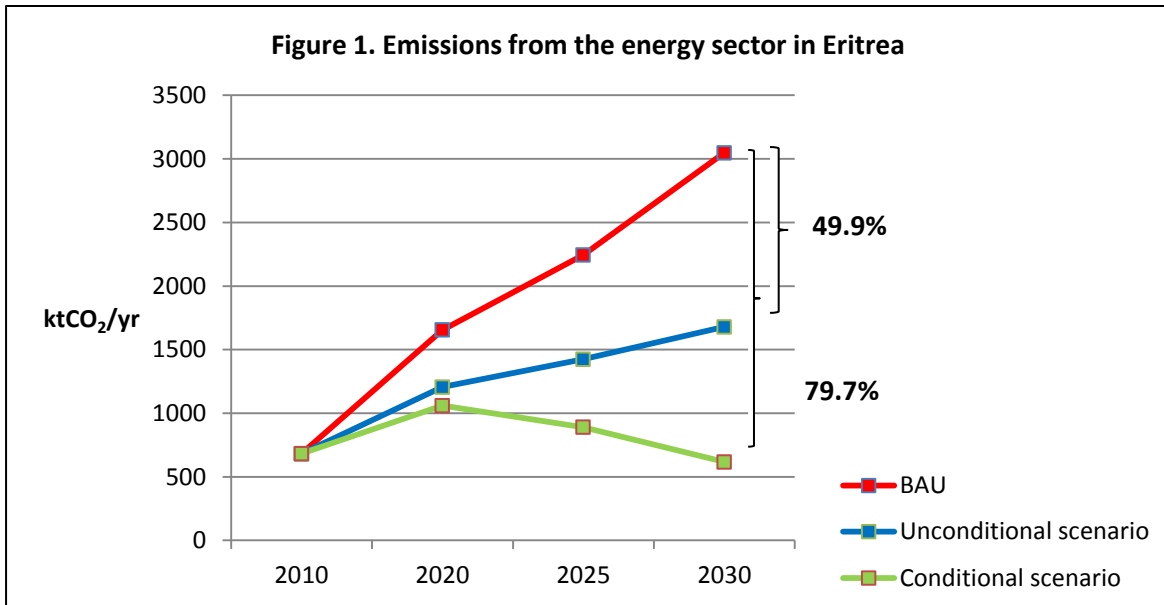
The BAU scenario for all fossil fuel CO₂ emission expected to increase 1.7 MtCO₂ in 2020, 2.2 MtCO₂ in 2025 and in 2030, 3 MtCO₂.

3.4 Unconditional Mitigation Measures

Unconditional mitigation scenario: With internal resources Eritrea can implement its unconditional scenario reaching 1.3 MtCO₂ in 2020, 1.6 MtCO₂ in 2025 and 1.9 MtCO₂ in 2030 from fossil fuel CO₂.

3.5 Conditional Mitigation Measures

Conditional mitigation scenario: With external assistances Eritrea can implement its conditional scenario reaching 1.1 MtCO₂ In 2020, 0.9 MtCO₂ in 2025 and 0.6 MtCO₂ in 2030 from fossil fuel CO₂.



3.6 Accounting Methodologies

The methodology used to estimate CH₄ and N₂O emissions were calculated based on IPCC guidelines of 2006 Volume 4 and Good Practice Guidance (GPG) 2003 and emissions from waste and industrial process was taken from the Second National Communication (SNC). The basis for the calculation of the emission reduction is the projection of GHGs from the 2010 inventory using the GACMO model (2015). The GACMO model was also used to calculate the abatement potential and corresponding investment requirement.



3.7 Fairness, Equity and Ambition

Eritrea in its policy encourages environmentally sound technologies to reduce the greenhouse gas emissions. It has committed itself and has embarked on an ambitious low-carbon and climate-resilient development pathway to achieve its development aspirations. The focus is to create a climate-resilient economy while contributing to the GHGs emission reduction up to 80.6% of the emissions from fossil fuels. Moreover, the Eritrean energy sector also emphasis on the use and introduction of renewable energy sources such as solar, wind and geothermal power to substitute efficiency improvement measures the fossil fuel dependency.

Eritrea makes a formal commitment to limit the growth of GHG emission despite only emitting less than 0.01% of the global GHG emissions in 2010. In the Business As Usual as of 2030 its emission is only about 1.15 t CO₂-eq/capita or 0.31 tCO₂-eq/US\$.

4. Eritrea's Adaptation Contributions

4.1 Planning Strategies

4.1.1 Agricultural and Forestry Development: Over 70% of Eritrea's population depends on agriculture and natural resources for its livelihoods. The population directly depends on land for crop and livestock production; and exploits the forests to extract wood and non-wood forest products including wild fruits and vegetables to supplement the diet of the households. Nonetheless, for most parts of the year, the population remains food insecure as the result of climate change and land degradation.

Consequent to recurrent droughts, desertification coupled with inappropriate land use practices has significantly contributed to the attrition of the natural resources-base. Consequently, the natural resources- base is failing to deliver the desired level of production to support the population. To arrest land degradation and hence to adapt climate change measures are underway to rehabilitate degraded land and protect forest from deforestation. Moreover, Eritrea has been undertaking vigorous efforts to enhance Climate Smart Agriculture.

4.1.2 Water resources development: Being located in drought-prone areas of Africa as well as its geological formation, Eritrea isn't endowed with both ground and surface water potential. Hence, water is a vital natural resource that deserves special attention.

In the area of water resources, adaptations to climate change focuses on the implementation of solar powered improved water systems interventions and provides clean and adequate water to all and assure efficient utilization of national water resources in all sectors and achieve sustainable development. Eritrea planned to achieve effective and efficient water resources assessment, development and management tools and plans.



4.1.3 Land Resource Management: Being the most critical resources upon which the livelihoods for the rural population of Eritrea depends, its conservation from all forms of degradation is the priority of the government. To that end, effective policy measures have already been taken to develop and enhance effective land cover, land capability and land classification system in the country to enhance its adaptive capacity to climate change.

4.1.4 Public Health: Climate change has direct impact on the public health. Due to climate change, there are indications of emergence of Malaria and Dengue Fever which, in the past, was confined to the lowlands has started to appear in highlands. To tackle the emerging climate related diseases and public health problems, Eritrea has been undertaking various integrated programs.

4.1.5 Marine Resources Development: As Eritrea is coastal state, climate change has direct impact on the development of marine resources. In the major cities, efforts are underway to monitor the sea level rise, increase sea water temperature and acidity. In this regard, the state has introduced and plans to promote an Integrated Coastal Marine and Islands Resources Management System through enforcement of policy measures and legal frameworks.

Promote sustainable fishing techniques through training and, equipping with boats and fishing gear. This will ensure adequate protection and sustainable exploitation of Eritrea's coastal, marine and island resources and the development of the fisheries sector.

4.2 Intended Adaptation Goals for 2030

- Development and establishment of new enclosure areas over 750,000 ha;
- Promotion of Conservation Agriculture/Climate Smart Agriculture in 5% of the cultivable land;
- Development and promotion of irrigation scheme by 170, 000 ha;
- Afforestation program will cover over 36,000 ha;
- Development of terrestrial and marine protected area over 1.5 million ha;
- Construction of 90 new dams and 120 pounds;
- Safe drinking water supply will increase from 75% to 100%;
- Desalination of sea water for domestic and economic sectors in 15 coastal towns and villages and 7 islands;
- Wastewater treatment plant established to treat 3 million m³ of water/year;
- Rehabilitations degraded land program for agriculture over 250,000 ha;
- Livestock production increased by 75%;
- Crop production of pulses will cover 25% of total cultivable land;
- Sustainable Land Management practice will be implemented in 15% of Eritrean total land covered;
- Prevalence of climate change related to public health problems and diseases will be prevented and reduced by 90%.



5. Means of Implementation

5.1 Financial Needs

5.1.1 Mitigation

The full and effective implementation of the Climate resilient Economy Strategy Eritrea requires an estimated expenditure of more than USD 1,086 million by 2030. This indicates the need for major capital investments. Therefore, the types of contributions required to implement Eritrea's INDC are categorized into unsupported and supported contributions.

Table 3: Eritrea's Investment needs for mitigation measures

Investment Million US\$	Conditional	Unconditional	Funding needs
Accumulated until 2030	1,086	393	694
Accumulated until 2025	627	247	380
Accumulated until 2020	244	105	140

5.1.2 Adaptation

Unconditionally, the Government of the State of Eritrea already spends a huge portion of its annual budget on infrastructure (construction of dams, roads) and the provision of social services (schools and hospitals), which contribute to addressing the negative impacts of climate change by reducing emissions and vulnerabilities of its people and the environment. On the other hand, the implementation of Eritrea's INDCs requires sustainable and reliable support in the form of finance, capacity building and technology transfer.

Table 4: Eritrea's Investment needs for Adaptation measures for 2030 (in millions)

Sectors	Conditional	Unconditional	Funding needs
Agriculture and Forestry	2,500	990	1,510
Water	1400	344	1,056
Land	370	148	222
Marine	280	113	167
Health	155	62	93
Cumulative budget (USD)	4,705	1,657	3,048

Apart from the unconditionally planned adaptation measures, Eritrea would further increase it by 60% provided funding is secured from regional and international financial agencies.

Over the coming 15 years Eritrea needs total investment in the conditional scenarios of USD **7.2 billion**. This includes 15% of the total budget will be required for governance and capacity building across all sectors for effective implementation of both adaptation and mitigation programs.



5.2 Capacity Building

The implementation of the abovementioned adaptation and mitigation actions for the period 2020 – 2030 requires the continuous development and strengthening of Eritrea’s capacities. Therefore, it is imperative to consolidate platforms for the exchange of knowledge and information related to adaptation at all levels of government, as well as to strengthen the networks with academic institutions and civil society.

Furthermore, it is fundamental to incorporate gender issues into capacity building, prioritizing the most vulnerable sectors and regions in order to reduce social inequality and the gap between women and men rights. Capacity building requires cooperation from developed countries to developing countries as well as south-south cooperation to enhance regional cooperation.

5.3 Community participation

At the local level, direct community participations are imperative. Hence, sensitisation and mobilization of the local communities at all levels is a pre-requisite for a success. It is also important to mainstreaming climate related topics to be included in the national educational system to make aware the school children about the risks of climate change.

Awareness rising about the adverse impacts of climate risks through various means, *inter alia*, the radio, television broadcasting, documentary films and press help to instil climate-related topics and issues to the public.

5.4 Research and development (Time series data and scientific research)

Mitigation and adaption measures are subject to continuous scrutiny; and for that time series data and scientific research are required to effectively quantify or estimate the outcomes of the interventions. For that there is a dire need for exchange of information and data is required for the areas covered in all the sectors. There is need for mainstreaming of climate change issues into the national development plans and strategies.

5.5 Technology Transfer Needs

Mitigation and adaption require the introduction of climate smart technologies. These require the transfer of technology from the developed to the developing countries to effectively and efficiently introduce in the proposed measures. In that direction, future research and development will focus on:

1. Quantification and assignment of the share of unsupported contributions that are planned and fully funded by the government to limit the quantity of emissions;
2. Quantification and assign the share of supported contributions that are planned by the government but require international support to limit the quantity of emissions;
3. Identification of the technical support needed to introduce new and additional policies and actions that stimulate and enable investment in limiting emission to 0.6 Mt or lower.



At the national level, for effective and efficient implementation of the mitigation and adaption measures, there is a need for synergetic efforts across the various sectors directly involved in the planning, implementation and monitoring and evaluation of programmes and projects.

Furthermore, Eritrea requires international support for the development of its own technologies as well as for technology transfer and innovation to increase its adaptive capacity.

For Eritrea, the increase of investment in disaster prevention is of utmost relevance, as well as the development of an insurance market against hydro meteorological and catastrophic risks, in which the private sector is invited and expected to play a relevant role.

6. Planning Strategies/Institutional Arrangements Implementation

The Eritrean INDCs is prepared based on existing sustainable development strategies, plans and objectives aligned with national development plans. It was developed with active stakeholder engagement and with full commitment of government officials at all levels. Hence, implementation of INDCs will be in line with existing plans, strategies, policies, legal frameworks as described in table 1. To enhance the implementation, moreover, continuous updating and reporting of climate related national documents such as National Communications (NC), Biennial Update Reports (BUR), Nationally Appropriate Mitigation Action (NAMA), and National Adaption Plan (NAP) will be prepared.

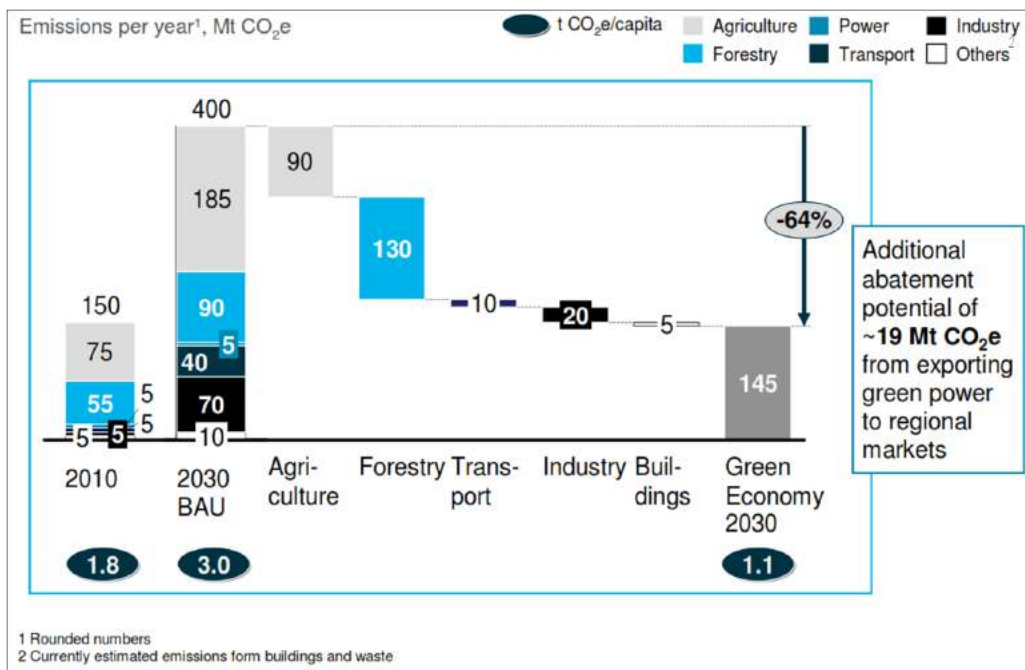
7. Monitoring and Reporting Progress

The State of Eritrea through the Ministry of Land, Water and Environment has the full responsibility to monitor and evaluate the implementation of INDCs through regular stakeholders consultative engagement. This will ensure the effective updating and implementation of both mitigation adaption plans.



Intended Nationally Determined Contribution (INDC) of the Federal Democratic Republic of Ethiopia

Ethiopia intends to limit its net greenhouse gas (GHG) emissions in 2030 to 145 Mt CO₂e or lower. This would constitute a 255 MtCO₂e reduction from the projected 'business-as-usual' (BAU) emissions in 2030 or a 64% reduction from the BAU scenario in 2030. Ethiopia also intends to undertake adaptation initiatives to reduce the vulnerability of its population, environment and economy to the adverse effects of climate change, based on its Climate Resilient Green Economy Strategy (CRGE). The CRGE is Ethiopia's strategy for addressing both climate change adaptation and mitigation objectives. The implementation of the CRGE would ensure a resilient economic development pathway while decreasing per capita emissions by 64% or more. The CRGE is also integrated into the Second Growth and Transformation Plan (the national development plan). In the long term, Ethiopia intends to achieve its vision of becoming carbon-neutral, with the mid-term goal of attaining middle-income status.



The full implementation of Ethiopia's INDC is contingent upon an ambitious multilateral agreement being reached among Parties that enables Ethiopia to get international support and that stimulates investments. The INDC will be updated periodically, as appropriate.



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Mitigation contribution of GHG emissions	
Gases covered	Carbon Dioxide (CO ₂), Methane (CH ₄) and Nitrous Oxide (N ₂ O), which are considered priority gases in the Ethiopian Green Economy Strategy.
Target year	2030
Sectors	<p>Sectors included are Agriculture (livestock and soil), Forestry, Transport, Electric Power, Industry (including mining) and Buildings (including Waste and Green Cities).</p> <p>The plan to mitigate GHG emissions is built on the following four pillars:</p> <ol style="list-style-type: none">1) Improving crop and livestock production practices for greater food security and higher farmer incomes while reducing emissions;2) Protecting and re-establishing forests for their economic and ecosystem services, while sequestering significant amounts of carbon dioxide and increasing the carbon stocks in landscapes;3) Expanding electric power generation from renewable energy;4) Leapfrogging to modern and energy efficient technologies in transport, industry and building sectors. <p>The total GHG emissions of Ethiopia in 2010 were 150 Mt CO₂ e. The sectoral GHG emission sources and their quantities were the following:</p> <ol style="list-style-type: none">a. Livestock emitted methane and nitrous oxide totalling 65 Mt CO₂e, i.e. 42% of the total;b. Crop cultivation emitted nitrous oxide totalling 12 Mt CO₂e, i.e. 9% of the total;c. Deforestation and forest degradation due to cutting and burning fuel wood and due to logging totalling 55 Mt CO₂e, i.e. 37% of the total;d. Electric power generation totalling 5 Mt CO₂e, i.e.3% of the total;e. Transport sector emissions totalling 5 MtCO₂e, i.e. 3% of the total;f. Industrial sector emissions totalling 4 Mt CO₂e, i.e. 3% of the total;g. Building sector emissions totalling 5 Mt CO₂e, i.e. 3% of the total.



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	<p>The emissions reduction, which constitutes a reduction of 255 MtCO₂e or 64% compared to ‘business-as-usual’ (BAU) emissions in 2030, includes 90 Mt CO₂e from agriculture; 130 Mt CO₂e from forestry; 20 Mt CO₂e from industry; 10 Mt CO₂e from transport; and 5 Mt CO₂e from buildings. This does not include the reduction of 19 Mt CO₂e in neighbouring countries due to the export of electric power to them from Ethiopia.</p>
<p>Planning processes</p>	<p>The Ethiopian INDC (EINDC) is aligned with the national development plan and anchored on the Climate Resilient Green Economy Vision and Strategy of Ethiopia. The EINDC was developed through an inclusive and participatory process.</p>
<p>Methodology</p>	<p>Under the CRGE, the 145 Mt CO₂e target was calculated by:</p> <ul style="list-style-type: none"> • examining where emissions were headed under a ‘business-as-usual’ (BAU) scenario and; • identifying abatement opportunities across sectors. <p>The methodology applied to forecast the BAU scenario was based on two steps. The first step was to forecast Ethiopia’s economic development. The second step was to compute the associated emissions using the economic development targets (2010-2015), past performance and the ambition to reach middle-income status before 2025. In the second step, the projected economic growth was translated into the BAU development of GHG emissions. The BAU estimation of GHG emissions forms the baseline for the development of Ethiopia’s Green Economy Strategy, quantifying what Ethiopia’s domestic GHG emissions would be if no actions were taken to limit emissions. The abatement potential was then calculated and compared with the BAU projection. The resulting BAU emission level was then converted into CO₂ emissions, which added up to 400 Mt CO₂e based on the standardized methodology (IPCC 2006 Guidelines). For tracking the progress towards the target in the EINDC, the following assumptions have been made:</p> <ul style="list-style-type: none"> • For metrics and methodologies Ethiopia proposes to use Global Warming Potential on a 100-year timescale in accordance with the IPCC's Fourth Assessment Report and the IPCC 2006 Guidelines.



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	<ul style="list-style-type: none"> The land sector is split into the agriculture and forestry sectors in the Ethiopian CRGE Strategy. Therefore, the treatment of the land sector is already included in the target presented by Ethiopia. The target has comprehensive coverage (100%) of the land sector. The Government of Ethiopia supports the development of robust rules to ensure accurate and transparent accounting of emissions from the land-sector.
Participation in international market mechanism	The Government of the Federal Democratic Republic of Ethiopia intends to sell carbon credits during the period to contribute towards achieving its Green Economy Strategy. Ethiopia supports the development of effective accounting rules under the UNFCCC to guarantee the environmental integrity of market mechanisms.
Adaptation to climate change	
Long-term goal	<p>Ethiopia's long-term goal is to ensure that adaptation to climate change is fully mainstreamed into development activities. This will reduce vulnerability and contribute to an economic growth path that is resilient to climate change and extreme weather events.</p> <p>Because climate change will affect all geographic areas of the country, its solution requires the participation of the entire population, especially farmers and pastoralists. Parallel to this, Ethiopia's response to climate change aims to integrate actions that improve the status of women and the welfare of children. Furthermore, measures to address climate change will be planned and implemented in a manner that addresses the wellbeing of the elderly, persons with disabilities and environmental refugees.</p>
Current and near-term action:	<p>Ethiopia has undertaken several strategic and programmatic adaptation actions. The strategies and plans include:</p> <ol style="list-style-type: none"> The National Adaptation Programme of Action (NAPA) since 2007; The Ethiopian Programme of Adaptation to Climate Change (EPACC 2011); Nine National Regional States and two City Administrations adaptation plans; Five sectoral adaptation plans; Agriculture sector adaptation strategy.



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	<p>Already several large-scale sustainable land and natural resource management programmes are ongoing, for example the Sustainable Land Management Programme and the Productive Safety Net Programme, which will contribute to building resilience to climate change.</p> <p>The main effort in the near-term is to build the capacity needed to mainstream adaptation to climate change into all public and private development initiatives. These efforts will build on existing good practices in order to mainstream and scale up these interventions.</p>
<p>Medium and long-term actions</p>	<p>Moving towards the long-term adaptation goal, the main effort up to and beyond 2020 is to increase resilience and reduce vulnerability of livelihoods and landscapes in three pillars; drought, floods and other cross-cutting interventions, as specified below:</p> <p><u>Drought</u></p> <ol style="list-style-type: none"> 1. Increase agricultural productivity, minimize food insecurity and increase incomes irrespective of climate change by breeding and making available improved crop varieties, primarily from among those in Ethiopia that suit all agricultural areas where varieties that were grown in the past have become unsuitable. 2. Protecting humans, wildlife and domestic animals from extreme droughts, at least to the extent that they will have water for drinking by diverting streams, digging wells and enhancing water harvesting techniques and thereby making available dependable watering points in all rural woredas (districts). 3. Improve and diversify economic opportunities from agroforestry and sustainable afforestation of degraded forest areas. 4. Enhance irrigation systems through rainwater harvesting and conservation of water, including improved water use efficiency. 5. Ensure the uninterrupted availability of water services in urban areas to make them comfortably and productively habitable irrespective of droughts through planning and construction of dams or deep wells, deployment of water saving technologies and wastewater treatment infrastructure. 6. Improve traditional methods that scientifically prevent deterioration of food and feed in storage facilities to enable local



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	<p>communities to store food and feed in productive years and secure food supply in case of extreme weather events.</p> <ol style="list-style-type: none">7. Create biodiversity movement corridors, especially up towards higher terrain, in areas where most of the land is under cultivation. This will minimize biodiversity loss through enabling the re-establishment and movement of plant and animal species and varieties to areas suitable for their survival when temperature rises.8. Enhancing ecosystem health through ecological farming, sustainable land management practices and improved livestock production practices to reverse soil erosion, restore water balance, and increase vegetation cover, including drought tolerant vegetation.9. Expanding electric power generation from geothermal, wind and solar sources to minimize the adverse effects of droughts on predominantly hydroelectric energy sector.
	<p><u>Flood</u></p> <ol style="list-style-type: none">1. Enhance the adaptive capacity of ecosystems, communities and infrastructure through an ecosystem rehabilitation approach in the highlands of Ethiopia. Rehabilitation of degraded lands/forests will also increase resilience of communities, infrastructures and ecosystems to droughts and floods.2. Building additional dams and power stations to further develop energy generation potential from the same river flow as well as develop new dam sites on parallel rivers in order to maintain the baseline hydropower electricity generation capacity to levels attainable under a 'no-climate change' scenario.3. Developing and implementing climate change compatible building/construction codes for buildings, roads, airports, airfields, dry ports, railways, bridges, dams and irrigation canals that are safe for human life and minimize economic damage that is likely to result from increasing extremes in flooding. <p><u>Other cross cutting interventions</u></p> <ol style="list-style-type: none">1. Developing one or more insurance systems to enable citizens, especially farmers and pastoralists, to rebuild economic life



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	<p>following exposure to disasters caused by extreme weather events (floods and droughts).</p> <ol style="list-style-type: none"> 2. Reducing the incidence and impact of fire and pest epidemics on livelihoods and ecosystems through integrated pest management, early warning systems, harvesting adjustments, thinning, patrols and wider public participation. 3. Effective early warning systems and disaster risk management policies to improve resilience to extreme weather events. 4. Strengthening capacity to deal with the expansion and emergence of human, animal, crop and plant diseases known to occur in and around Ethiopia and in similar environments elsewhere and make available medicines in a sufficient quantity to deal with these diseases. 5. Strengthening and increasing the capacity for breeding and distributing disease resistant crop and fodder varieties to farmers and other land users in order to deal with the emergence and expansion of diseases and pests.
Monitoring and Evaluation	<p>The Ministry of Environment and Forest (MEF) will regularly organize consultative dialogues to review the implementation of the national and sectoral adaptation plans. This iterative process will ensure that national and sectoral adaptation plans are regularly updated and implemented.</p>
<p>Fairness, equity, ambition and Means of Implementation (Cross-cutting for both mitigation and adaptation)</p>	
Fairness, equity and ambition	<p>Despite being a Least Developed Country, Ethiopia has already placed itself on the path to undertake a substantial national program of climate action, outlined in the Climate Resilient Green Economy Strategy (CRGE).</p> <p>At 1.8 tCO₂e, Ethiopia’s per capita GHG emissions are insignificant compared to total global emissions. If Ethiopia’s contribution is fully implemented, it would reduce per capita emissions to 1.1 tCO₂e by 2030. For a Least Developed Country, this reduction exceeds expectations for both fairness and ambition while contributing towards the achievement of the objective of the Convention.</p> <p>Ethiopia has already removed fossil fuel subsidies to enable</p>



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enhanced generation and use of clean and renewable energy. 76.7% of Ethiopia's population currently lacks access to modern energy sources, relying on wood for fuel. By continuing to prioritise renewable energy under the CRGE, Ethiopia will be able to increase energy access in rural areas. In this context, substantial investments are already being made, including the construction and operationalization of the Ethiopian Grand Renaissance Dam (GERD), amounting to USD 4 Billion generated from domestic sources.

Ethiopia's greatest emission reduction potential is in the agriculture and forestry sectors, constituting 85% of emissions in 2010. Therefore, one of the priority initiatives under the CRGE is the use of more efficient stoves, amounting to an emissions reduction rate of 50 MtCO_{2e} per year by 2030. Furthermore, Ethiopia intends to increase its ambition by expanding its forest cover, beyond the initial target for the afforestation and reforestation of 7 Million Hectares, with continued involvement from local communities that are already contributing substantially to the attainment of this target. By prioritising initiatives such as these, Ethiopia is maximising its mitigation potential and contributing towards the achievement of the objective of the Convention, whilst simultaneously supporting its sustainable development goals.

An important component of Ethiopia's contribution includes actions to build resilience and enhance adaptation to the impacts of climate change. Given that 80% of the population depends on agriculture for their livelihoods, increasing the resilience of agriculture is a priority for Ethiopia. This includes addressing the high levels of vulnerability of the sector to droughts and floods.

Ethiopia also seeks to maximise the synergies between adaptation and mitigation, especially involving agriculture and forests. Many of the measures involving forestry and agriculture can provide substantial economic and livelihood benefits. By targeting actions in these sectors, Ethiopia is seizing the opportunities that ambitious climate action brings, helping to reduce both its future emissions and its vulnerability to climate impacts.

Ethiopia recognises the negative impact of climate change on health, economic growth and natural resource conservation and that is why



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	<p>it has committed to undertake such ambitious action using its domestic resources. However, there are enormous untapped opportunities for increased action on climate change, including both mitigation and adaptation, in Ethiopia. For more than 80% of the abatement potential, abatement costs are less than USD 15 per ton CO_{2e}. With additional support to mobilise finance, infrastructure, technology and capacity to undertake and oversee implementation, Ethiopia can realize its full potential to act and increase its contributions even further.</p>
<p>Means of Implementation</p>	<p>The Government of Ethiopia already spends a substantial portion of its annual budget on infrastructure and the provision of social services, which contribute to addressing the negative impacts of climate change by reducing emissions and vulnerabilities. However, the full implementation of Ethiopia’s INDC requires predictable, sustainable and reliable support in the form of finance, capacity building and technology transfer.</p> <p><u>Mitigation of GHG emissions</u></p> <p>The full and effective implementation of the Green Economy Strategy requires an estimated expenditure of more than USD 150 billion by 2030. This highlights the need for significant capital investments. Therefore, the types of contributions required to implement Ethiopia’s INDC are categorized into unsupported and supported contributions.</p> <p>Future research will be conducted to:</p> <ol style="list-style-type: none"> 1. Quantify and assign the share of unsupported contributions that are planned and fully funded by the government to limit the quantity of emissions; 2. Quantify and assign the share of supported contributions that are planned by the government but require international support to limit the quantity of emissions; 3. Identify the technical support needed to introduce new and additional policies and actions that stimulate and enable investment in limiting emission to 145 Mt or lower. <p><u>Adaptation to climate change</u></p>



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Future research will be conducted in order to:

1. Quantify the required international financial, technological and capacity building support for the implementation of vulnerability abatement measures up to and beyond 2030;
2. Identify and quantify the technical support needed for the adequate integration of climate change adaptation considerations into existing and planned policies, strategies, plans, programmes and projects;
3. Identify the required technical support to quantify the cost of countering social, environmental and economic vulnerabilities that are likely to result from the adverse impacts of climate change.



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Supplementary Information

The Climate Resilient Green Economy Strategy (CRGE) issued by the Federal Democratic Republic of Ethiopia in 2011 provided an important opportunity to:

- Transform to a new economic development model, using domestic resources and global climate change finance; and
- Build resource-competitive advantages, while responding to the adverse effects of climate change.

The foundation of Ethiopia's Intended Nationally Determined Contributions (EINDC) is its CRGE Strategy. The CRGE sets out to deliver the following objectives of:

- Lifting Ethiopia to middle-income status by 2025;
- Ensuring economic development is sustainable by limiting GHG emissions;
- Creating green job opportunities;
- Protecting the Ethiopian population and economy against the adverse effects of climate change; and
- Contributing to the global effort in responding to climate change.

The EINDC has two mutually integrated components:

- Reducing greenhouse gas emission; and
- Reducing the vulnerability of the Ethiopian population, environment and economy to the adverse effects of climate change.

The emission reduction component of EINDC will help Ethiopia to achieve:

- Economic development objectives in a resource-efficient way and attract global climate finance;
- Avoid the unintended consequences of a carbon-intensive development path such as fossil fuel dependence, health issues, traffic congestion and land degradation; and
- Contribute to the ongoing global fight against climate change while advancing the welfare of Ethiopians.

Many of the emission reduction initiatives contained under the EINDC offer positive returns on investment, thus directly promoting economic growth and creating additional high-quality green jobs. The implementation of the emission reduction component of EINDC to the fullest will also lead Ethiopia to achieve carbon neutrality. Further



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development co-benefits of the emission reduction component of the EINDC include, among others:

- Improved public health through better air and water quality; and
- Strengthened rural economic development through higher agricultural production, leading consequently to greater food security.

The Federal Democratic Republic of Ethiopia is taking measures to adapt to the inevitable reality of climate change, which is expected to intensify as the world's climate changes, due to both the already accumulated and anticipated global GHG emissions. In this regard, Ethiopia's Programme of Adaptation to Climate Change (EPACC) and sectoral climate resilience strategies were developed to provide a framework to build resilience to climate shocks, with emphasis on:

- Reducing the cost of countering vulnerability and ensuring adaptation to protect the population – especially in rural areas – from adverse effects of global warming; and
- Safeguarding economic development in order to ensure that Ethiopia will attain middle-income status by 2025, despite the current and anticipated climate change. The most vulnerable sectors to climate shocks include health, agriculture, water, energy, buildings and transport.

Ethiopia requires substantial resources to limit the emission of its GHGs and to build resilience to climate shocks. To this end, Ethiopia has already committed significant resources to reduce GHGs and build resilience, including for the implementation of:

- Afforestation and land rehabilitation interventions;
- Generation and distribution of electricity from clean and renewable sources;
- Investment in improved transportation systems (e.g. railway) that utilize clean and renewable energy. These investments will be complemented by urban planning transition towards mixed use, compact, and polycentric cities, resulting in shorter distances travelled to reduce transport/traffic related GHG emissions.
- Several structural measures have also been put in place including the removal of fossil fuels subsidies.

In order to realize the full potential of its mutually reinforcing EINDC objectives of reducing emission and building resilience, Ethiopia seeks to utilize existing and emerging climate finance mechanisms. Ethiopia also welcomes the continued support of bilateral and multilateral development partners, as well as the engagement of the private sector in



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achieving its ambitious goals set under the EINDC. In this context, Ethiopia has already put in place a national fund, the Climate Resilient Green Economy Facility (CRGE Facility), as a mechanism to mobilize finance from various sources, and drive investments to build resilience and for green growth. The key features of the CRGE Facility are:

- Providing flexible, coordinated and predictable funding to support the achievement of national priorities set out under the CRGE;
- Blending diverse sources of climate financing and leveraging public funds to attract private funds; and
- Providing a unified engagement point where government, development partners, civil society and other stakeholders can engage and make decisions about climate change issues.

The Facility has already managed to attract resources from a number of bilateral and multilateral development partners.

Overall, the EINDC marks an important next step on the path towards sustainable development, consistent with the Principle of Common but Differentiated Responsibilities and Respective Capabilities. In this context, Ethiopia reaffirms its continued commitment to build a climate resilient green economy. This EINDC contributes to the global effort to mitigate climate change, while ensuring the realization of an equitable and resilient green economic growth nationally.



SUBMISSION BY LATVIA AND THE EUROPEAN COMMISSION ON BEHALF OF THE EUROPEAN UNION AND ITS MEMBER STATES

Riga, 6 March 2015

Subject: Intended Nationally Determined Contribution of the EU and its Member States

Introduction

1. The EU and its 28 Member States are fully committed to the UNFCCC negotiating process with a view to adopting a global legally binding agreement applicable to all Parties at the Paris Conference in December 2015 in line with the below 2°C objective.

Intended nationally determined contribution (INDC) of the EU and its Member States

2. The Lima Conference confirmed the Warsaw decision that all Parties ready to do so should communicate their INDC in the first quarter of 2015 in a manner that facilitates the clarity, transparency and understanding of the INDC.
3. The EU and its Member States wish to communicate the following INDC. The EU and its Member States are committed to a **binding target of an at least 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990**, to be fulfilled jointly, as set out in the conclusions by the European Council of October 2014. In line with the Lima Call for Climate Action, in particular its paragraph 14, the following quantifiable information is hereby submitted:

ANNEX

Intended Nationally Determined Contribution of the EU and its Member States	
Parties	EU and its Member States (Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, United Kingdom) acting jointly
Type	Absolute reduction from base year emissions.
Coverage	Economy-wide absolute reduction from base year emissions.
Scope	All greenhouse gases not controlled by the Montreal Protocol: Carbon Dioxide (CO ₂) <ul style="list-style-type: none">• Methane (CH₄)• Nitrous Oxide (N₂O)• Hydrofluorocarbons (HFCs)• Perfluorocarbons (PFCs)• Sulphur hexafluoride (SF₆)• Nitrogen trifluoride (NF₃)
Base Year	1990.
Period	1 January 2021- 31 December 2030.
Reduction Level	At least 40% domestic reduction in greenhouse gas emissions by 2030.
% of Emissions Covered	100%.
Agriculture, forestry and other land uses	Policy on how to include Land Use, Land Use Change and Forestry into the 2030 greenhouse gas mitigation framework will be established as soon as technical conditions allow and in any case before 2020.
Net Contribution of International Market Based Mechanisms	No contribution from international credits.

Planning Process	Domestic legally-binding legislation already in place for the 2020 climate and energy package. The existing legislation for land use, land-use change and forestry (EU Decision 529/2013) is based on the existing accounting rules under the second commitment period of the Kyoto Protocol. Legislative proposals to implement the 2030 climate and energy framework, both in the emissions trading sector and in the non-traded sector, to be submitted by the European Commission to the Council and European Parliament in 2015-2016 on the basis of the general political directions by the European Council, taking into account environmental integrity.
Fair and ambitious	The target represents a significant progression beyond its current undertaking of a 20% emission reduction commitment by 2020 compared to 1990 (which includes the use of offsets). It is in line with the EU objective, in the context of necessary reductions according to the IPCC by developed countries as a group, to reduce its emissions by 80-95% by 2050 compared to 1990. Furthermore, it is consistent with the need for at least halving global emissions by 2050 compared to 1990. The EU and its Member States have already reduced their emissions by around 19% on 1990 levels while GDP has grown by more than 44% over the same period. As a result, average per capita emissions across the EU and its Member States have fallen from 12 tonnes CO ₂ -eq. in 1990 to 9 tonnes CO ₂ -eq. in 2012 and are projected to fall to around 6 tonnes CO ₂ -eq. in 2030. The emissions in the EU and its Member States peaked in 1979.
Key Assumptions	
Metric Applied	Global Warming Potential on a 100 year timescale in accordance with the IPCC's 4th Assessment Report.
Methodologies for Estimating Emissions	IPCC Guidelines 2006 and IPCC 2013 KP Supplement.
Approach to accounting for agriculture, forestry and other land uses	Comprehensive accounting framework, activity or land-based approach, for emissions and removals from land use, land-use change and forestry.
Coverage	
Sectors/Source Categories	<ul style="list-style-type: none"> • Energy <ul style="list-style-type: none"> ○ Fuel Combustion <ul style="list-style-type: none"> ▪ Energy industries ▪ Manufacturing industries and construction ▪ Transport ▪ Other sectors ▪ Other

	<ul style="list-style-type: none"> ○ Fugitive emissions from fuels <ul style="list-style-type: none"> ▪ Solid fuels ▪ Oil and natural gas and other emissions from energy production ○ CO₂ transport and storage ● Industrial processes and product use <ul style="list-style-type: none"> ○ Mineral industry ○ Chemical industry ○ Metal industry ○ Non-energy products from fuels and solvent use ○ Electronic industry ○ Product uses as substitutes for ODS ○ Other product manufacture and use ○ Other ● Agriculture <ul style="list-style-type: none"> ○ Enteric fermentation ○ Manure management ○ Rice cultivation ○ Agricultural soils ○ Prescribed burning of savannas ○ Field burning of agricultural residues ○ Liming ○ Urea application ○ Other carbon-containing fertilisers ○ Other ● Waste <ul style="list-style-type: none"> ○ Solid waste disposal ○ Biological treatment of solid waste ○ Incineration and open burning of waste ○ Wastewater treatment and discharge ○ Other ● Land Use, Land-Use Change and Forestry set out in Decision 529/2013/EU <ul style="list-style-type: none"> ○ Afforestation, reforestation ○ Deforestation ○ Forest management ○ Cropland management ○ Grazing land management ○ Or equivalent land-based accounting using UNFCCC reporting categories ○ Other categories/activities elected by the EU and its Member States as Parties to the Kyoto Protocol and its Doha Amendment.
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Follow up

4. The EU and its Member States urge all other Parties, in particular major economies, to communicate their INDCs by the end of March 2015 in a manner that facilitates their clarity, transparency and understanding.
 5. The EU and its Member States request the UNFCCC Secretariat to publish the INDC of the EU and its Member States on its website and to take it into account when preparing the synthesis report on the aggregate effect of the INDCs communicated by Parties.
 6. The EU and its Member States look forward to discussing with other Parties the fairness and ambition of INDCs in the context of the below 2°C objective, their aggregate contribution to that objective and on ways to collectively increase ambition further.
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Fiji's Intended Nationally Determined Contribution

1.0 National Circumstances

Physical characteristics¹

Fiji lies between 177° E and 178° W Longitude and 12° to 22° S Latitude with a land area of 18,333 km² and an exclusive economic zone of 1.3 million square kilometers. This includes 332 islands of which about a third are inhabited. The majority of the land is on continental-like volcanic islands that rise to well over 1,000 meters in elevation. Over 87% of the land is concentrated in the islands of Viti Levu and Vanua Levu. Fiji's climate is tropical, averaging 26°C with annual rainfall ranging from 1800 to 2600 mm. It is considerably richer in natural resources than its Polynesian and Micronesian neighbors with extensive timber, rich soils, mineral deposits and fish. The country is subject to earthquakes, landslides, cyclones, flooding, and storm surges.

Population

The latest census was undertaken in 2007 and shows a population of 837,217 (2007) and an annual population growth of 0.8%. During the last two decades, the national population growth rate has remained relatively low by Pacific Island standards. Given the continuation of the present growth rates for the different ethnic groups, it is estimated that the population for Fiji will reach the one million mark in 2030 and that by 2030, 61% of the population will be urban.

The Economy

The World Bank classifies Fiji as a lower middle-income economy² with a per capita GDP in 2011 reported to be US\$ 4,397. Fiji's growth has been extremely volatile as a result of a series of external and internal shocks. These include a series of natural disasters (cyclones in 1985, 1992, 1993, 2009, and 2010); two global oil shocks (in 1979 and in 1981–1982); the Asian financial crisis (1997); spikes in food and fuel prices (2008); the global economic crisis (2009 and 2010); and, more recently, severe flooding in the Western and Northern Divisions of the country (January 2012 and late March 2012) followed by Tropical Cyclone Evan in December 2012.³

Fiji, as a small island developing state and because of its location is more vulnerable and is at the forefront of being impacted by climate change. Despite contributing a mere 0.04% of greenhouse gas emission to the atmosphere compared to the global average, Fijian communities are experiencing climate change impacts such as eroding shorelines and riverbanks, shortage of water, depleted fisheries stock, reduced food production, large-scale flooding, increase in outbreaks of vector borne diseases and sea level rise. The Fijian government therefore recognizes the importance of adapting to climate change and coordinating climate change related adaptation policies, strategies, plans, and activities to reduce the vulnerability and enhance the resilience of Fiji's communities to the impacts of climate change and disasters.

¹ Sustainable Energy for All (SE4All): Rapid Assessment and Gap Analysis

² <http://data.worldbank.org/country/fiji>

³ Fiji 2012: Revitalizing the Fiji economy, Mandaluyong City, Philippines

The climate of Fiji is generally categorized as an oceanic tropical marine climate and varies over different timescales. The major features that drive Fiji's climate are: the El Nino Southern Oscillation (ENSO) phenomenon that occurs every four years on average, the South Pacific Convergence Zone and the Trade Winds.

Fiji signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and ratified it in 1993. Fiji's commitments to this Convention are outlined in the National Climate Change Policy of 2012. The Mauritius Strategy 2005-2015 and the Barbados Plan of Action 1994, which attempt to address the problems of small island developing states (SIDS) have climate change as a significant issue. Fiji will continue to contribute to the implementation of the Post 2015 SAMOA Pathway (through the implementation of the National Climate change Policy.

Also at the regional level, the Pacific Island Framework for Action on Climate Change 2006-2015 is focused on building the resilience of communities to combat the impact of climate change. A successor regional framework that incorporates elements of Disaster Risk Management is being negotiated.

Fiji is currently undergoing essential sectoral policy and institutional reform that involves the review and update of existing legislation and policies. The focus of the reform is to ensure sustainable economic and social development and thereby improve the livelihoods of all communities in Fiji.

Policies have been developed in the areas of agriculture, land use, forestry, fisheries and water. They focus on the sustainable management of Fiji's natural resources and the establishment of appropriate institutional arrangements for effective implementation and monitoring. A major component is the incorporation of environmental management in order to address issues that emanate from natural hazards and unsustainable resource management and utilization. These policies play an important role in supporting efforts to reduce adverse impacts of climate change on Fiji's economic and social development.

Climate change constitutes one of the greatest barriers to sustainable development. It puts Fiji's biodiversity and ecosystems, particularly marine and coastal, at risk. This has severe implications for Fiji's economic growth, as the country relies heavily on its natural resources for economic development; fisheries, forestry and agriculture are its primary industries. The effects of climate change are widespread and cross-sectoral. Effective co-ordination of a multi-disciplinary approach and a well-established government position on issues and policies will need to be strengthened to effectively address the impacts of climate change.

2.0 Fiji's Intended Nationally Determined Contribution

In accordance with the relevant paragraphs of Decisions 1/CP.19 and 1/CP.20, Fiji hereby communicates its Intended Nationally Determined Contribution (INDC) towards achieving the ultimate objective of the Convention, and provides up-front information in tabular format to facilitate the clarity, transparency and understanding of the INDC. Fiji is also pleased to provide additional accompanying information, including information relating to mitigation and adaptation planning.

The achievement of the emission reduction target specified above will be through both unconditional and conditional means based on available and additional external financing being made available to Fiji. From the 30% emission reduction target, 10% will be achieved through the implementation of the Green Growth Framework, utilizing resources available in country (unconditional) whereas the remaining target can only be met with the availability of external funding amounting to US\$500 million (conditional).

Whilst Fiji's INDC is specific to the energy sector, further accounting will need to take place to incorporate the mitigation potential of Fiji's Forestry sector via the REDD+ programme, and other critical sectors.

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTIONS OF FIJI

PARTY: Fiji		DATE: 20 October, 2015
Parameter		Information
Period for defining actions	Start year: 2020	End year: 2030
Type and level of Commitment	Sector specific reduction focusing on a renewable energy target for electricity generation. In addition a general emissions reduction by improvements in energy efficiency economy wide. The target is for the renewable energy share in electricity generation to approach 100% by 2030 from around 60% in 2013. In addition an indicative reduction of 10% CO ₂ emissions for energy efficiency improvements economy wide will be sought. These measures will reduce CO ₂ emissions in the energy sector by around 30% from BAU by 2030.	
Reference year or period	2013	
Estimated, quantified emissions impact	A business as usual (BAU) scenario for total fossil fuel increases for energy production for extrapolated population and economic growth would give total CO ₂ emissions in 2030 from the energy sector of around 2500 Gg with an electricity sector CO ₂ emission level of around 500 Gg. With the energy sector reductions the emissions in 2030 would thus be around 1800 Gg A close to 100% renewable target would thus reduce BAU emissions by 20%. The additional sector wide energy efficiency reduction of 250Gg or 10% of 2030 emissions would give a total reduction of 30% over BAU for 2030.	
Baseline	The electricity sector CO ₂ emissions in 2013 were 340 Gg. The 2013 baseline total energy sector CO ₂ emissions were close to 1500Gg.	
Coverage	% National emissions (as at 2013)	1.5 million tonnes of CO ₂ from the Energy sector
	Sectors	Energy target as above

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTIONS OF FIJI

PARTY: Fiji		DATE: 20 October, 2015
Parameter		Information
	Gases	CO ₂
	Geographical boundaries	Nation-wide
Further information, relevant to commitment type, required for the purpose of providing Clarity, Transparency and Understanding		<p>Fiji's target is consistent with that laid out in the Green Growth Framework and is also aligned with the Sustainable Energy for All (SE4ALL) initiative of the United Nations.</p> <p>Fiji's target is based on modelling future energy balances and based on best available historical data for both supply and demand side of the national energy balance. The Government policy favours a diversified renewable energy portfolio including hydro, geothermal, biomass and grid connected solar and wind but further feasibility studies need completing before the final mix is determined.</p> <p><u>Conditionality:</u> The achievement of the emission reduction target specified above will be through both unconditional and conditional means based on available and additional external financing being made available to Fiji. From the 30% emission reduction target, 10% will be achieved through the implementation of the Green Growth Framework, utilizing resources available in country (unconditional) whereas the remaining target can only be met with the availability of external funding amounting to US\$500 million (conditional).</p>
Intention to use market based mechanisms to meet commitments		In order to achieve rapid and cost efficient mitigation, a combination of robust global market based mechanisms and direct aid transfers will be essential. Achieving our conditional goal will require substantial funding including fully functional bilateral, regional and international market mechanisms such as the Clean Development Mechanism (CDM)
Land sector accounting		N/A

INFORMATION ON INTENDED NATIONALLY DETERMINED CONTRIBUTIONS OF FIJI

PARTY: Fiji	DATE: 20 October, 2015
Parameter	Information
approach	
Estimated macro-economic impact and marginal cost of abatement	A reduction in the cost of imported fuels equivalent to around 200 million litres of diesel and or heavy fuel oil by the year 2030 over BAU imports. Improved energy security and reduction on the dependence on imported fuel as a source of energy for electricity generation.
Narrative supporting the fair-share assessment of the contribution	Fiji's per capita 2013 CO ₂ emissions are estimated to be around 1.5 tonnes compared to the world average of 5.6 tonnes. Fiji is a developing country and has historically not been responsible for the emissions of the developed world. Fiji will do the best to mitigate but not at the expense of raising the standard of living for the poor of the country. As such Fiji's INDC commitment must be contingent on obtaining international funding to proceed with mitigation options.
Description of key domestic policies and measures giving effect to commitment	<p>Green Growth Framework 2014</p> <p>Draft Energy Policy 2013</p> <p>Draft Energy Strategic Action Plan 2013</p> <p>Sustainable Energy for All (SE4All) global report</p> <p>Fiji Electricity Authority draft Power Development Plan</p> <p>Electricity Act (Cap.180)</p> <p>Clean Development Mechanism Policy Guideline 2010</p>
Key assumptions on Mitigation	The key assumption is that finance can be obtained for mitigation in the power sector and assistance with energy efficiency improvements economy wide.

3.0 Key challenges and Proposed Way Forward, Action and Time bound Indicators to achieve Fiji’s Emission Reduction Target

Key Challenges	Proposed Way Forward, Actions and Time bound Indicators
<p>There is a need to reduce dependence on imported fossil fuel as a source of energy for electricity generation.</p>	<p>Short Term (up to 2 years)</p> <ul style="list-style-type: none"> • Investment into more renewable energy projects which are feasible in Fiji such as solar (stand alone, solar farm, photovoltaic grid connected), biofuel, wind, micro hydro projects and biogas power generation (agricultural wastes). • Continued research and development in the area of new renewable energy technologies, including further exploration of ocean energy, geothermal energy, wave energy and generation of energy from waste. • Explore whether use of renewable energy could be considered a part of the approval process for new investments. <p>Medium Term (3 to 5 years)</p> <ul style="list-style-type: none"> • Promote and improve guidelines and technical standards for renewable energy technologies <p>Long Term (over 5 years)</p> <ul style="list-style-type: none"> • Continue research and development for energy from possible hydro carbon resources and hydrogen fuel cells. • Renewable energy share in electricity to be around 99% by 2030 from the 61% in 2013.

4.0 Mitigation

Energy in Fiji is supplied in three main forms: i) biomass/wood for cooking in rural areas and to a lesser extent for power co-generation in the wood and sugar industries; ii) as imported fossil fuels and iii) as electricity, of which a significant share is generated from hydropower with much smaller contributions from wind and solar energy.

4.1 Electricity

Fiji has many opportunities that have been identified for transferring most, if not all, of its electricity generation to renewable options. In this regard the relatively high installed capacity of hydro of around 120MW presents itself as a large scale storage facility for intermittent renewable inputs to be fed to the main grid. Wind has been trialled at the Butoni site in Sigatoka with mixed results. Large-scale biomass production is also an important option that is part of the mix from the Fiji Sugar Corporation (FSC) and timber producers. In addition small scale biomass is a distinct possibility. Geothermal has been identified as early as the 1960s but due to the relatively small nominal capacity of individual sites this technology has not progressed to large scale implementation maybe incompatible with the timescale presented by climate change. In addition, other sources such as wave and ocean energy and geothermal energy have also been investigated over the past decades but are not close to implementation.

It is clear that large-scale hydro in Fiji has been very successful and that the technology has been transferred relatively easily and implemented with considerable competence by the Fiji Electricity Authority (FEA). In recent years, the Monasavu system has been added to with another relatively large system at Nadarivatu. Unfortunately solar PV does not have as good capacity factor as hydro and so for a comparable kwh output around 5 times the installed capacity needs to be put in place. Nevertheless, solar PV is now becoming cheaper, almost by the month, and large-scale systems are now economically viable in most locations in the world with good solar regimes. In addition, such systems work best in conjunction with a fast switching stored generation option such as hydro schemes.

4.2 Energy efficiency

Energy efficiency has also been identified as a relatively low cost easily implemented option however, one that has not been seriously implemented in the country for various reasons including financial constraints. Energy efficiency will become more important as higher cost renewable resources are employed but, the law of physics always limits improvements, if they are unlikely to give the reductions needed for complete decarbonisation.

4.3 Transport

The addiction of modern society to individual transport options is common to Fiji and the country has been increasing its number of motor vehicles at around 5% pa from at least the 1970s. In addition, the engine size distribution is moving in the wrong direction for energy and emissions savings. Finally it is likely that the infrastructure that has been needed to accommodate such an increase in vehicle numbers has been a drain on national resources that is now locking in development to this transport mode. This path makes mitigation in this area difficult and more or less constrained to fuel switching (either biofuels or electricity) rather than mode changing for instance to improved public transport systems.

5.0 Adaptation

Fiji is in the front line of climate change. Increased droughts, floods and extreme events such as cyclones affect every sector of Fiji's economy and impact employment levels, the availability of natural resources and resilience. The goal of the objective of Adaptation of Fiji's National Climate Change Policy is to reduce the vulnerability and enhance the resilience of Fiji's communities to the impacts of climate change and disasters and as such, Fiji is proactively creating and refining policies, institutions and budgetary systems that can mobilize resources toward climate change and disaster risk management activities.

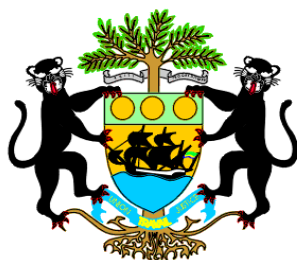
Some progress has already been made towards building resilience Government has commenced with the conducting of Vulnerability and Adaptation assessments for the whole of Fiji, invested in improving early warning systems, dredging of river mouths, construction of inland retention dams and the construction of cyclone proof homes in the most affected areas. Rehabilitation plans are focused on the principle of "building back better" especially for rural housing and infrastructure such as roads, water and energy. In the agriculture and forestry sector, the planting of traditional tree and root crops is being undertaken to minimize soil erosion and land degradation and desertification. The planting of mangroves, construction of seawalls and the relocation of communities to higher grounds are part of ongoing adaptation initiatives.

5.1 Key challenges and Proposed Way Forward, Action and Time bound Indicators for Adaptation⁴

Key Challenges	Proposed Way Forward, Actions and Time bound Indicators
There is a need to develop an integrated approach and policy and operational level to effectively address climate change.	<p>Short Term (up to 2 years)</p> <ul style="list-style-type: none"> • Establish a National Platform for Climate Change and Disaster Risk Management by 2015. • Develop a National Strategic Plan for Climate Change and Disaster Resilience by 2015. • Review the Fiji National Disaster Management Arrangements to include Climate Change by 2016.
There is a need to ensure that buildings constructed in urban and rural areas are cyclone resistant.	<p>Short Term (up to 2 years)</p> <ul style="list-style-type: none"> • Review the National Building Code by end of 2016. <p>Medium Term (3 to 5 years)</p> <ul style="list-style-type: none"> • Provide incentives to support compliance with new building standards by 2017.
There is a need to strengthen the role of local governments in building resilience.	<p>Short Term (up to 2 years)</p> <ul style="list-style-type: none"> • Development of a Local Government Self-Assessment Tool for Climate Change Resilience by 2016. • Review the town plan regulations to facilitate the enforcement of zoning and buffer zones for coastal areas, rivers banks, high risk areas and mangrove areas. Review to be completed by 2016.
There is a need for greater understanding of the impacts of climate change in order to better plan for long term development.	<p>Short Term (up to 2 years)</p> <ul style="list-style-type: none"> • Develop a comprehensive assessment framework, including adoption of the damage and loss assessment methodology by 2015. <p>Medium Term (3 to 5 years)</p> <ul style="list-style-type: none"> • Institutionalise a mechanism to collect and analyse hazard, vulnerability and exposure data by 2017. • Mainstream cost-benefit analysis into decision making process in mitigation and preparedness measures by 2017. • Encourage collaboration with development partners and tertiary institutions in conducting research on priority areas with climate change and disaster risk reduction by 2017. <p>Long Term (over 5 years)</p> <ul style="list-style-type: none"> • Develop hazard maps and models for all potential hazards (including sea level rise, storm surge, flood and tsunami) by 2020.
There is a need to ensure climate change mitigation and adaptation become a part of the national and sub national development planning and budgetary process.	<p>Short Term (up to 2 years)</p> <ul style="list-style-type: none"> • Integrate the climate change and disaster risk reduction into the National Development Plan by 2015. • Revise capital budget appraisal guidelines to incorporate comprehensive hazard and risk management (CHARM) and vulnerability and adaptation (VA) assessments by 2015.
There is a need to increase the resourcing of adaptation and	<p>Short Term (up to 2 years)</p> <ul style="list-style-type: none"> • Explore climate change financing modalities by 2015.

⁴ A Green Growth Framework for Fiji

mitigation measures.	<p>Medium Term (3 to 5 years)</p> <ul style="list-style-type: none"> • Improve access to global financing facilities such as the Global Green Fund.
There is a need to strengthen partnerships at all levels for building resilience for climate change.	<p>Short Term (up to 2 years)</p> <ul style="list-style-type: none"> • Partner with civil society in undertaking capacity building at divisional and community level on building resilience, including through incentivising performers/performance. <p>Medium Term (3 to 5 years)</p> <ul style="list-style-type: none"> • Undertake vulnerability assessment for all communities by 2019. • Develop climate and disaster resilience plans for urban and rural communities (prioritising squatter settlements and other vulnerable communities) by 2019. <p>Long Term (over 5 years)</p> <ul style="list-style-type: none"> • Capacity building provided to communities for which vulnerability assessments have indicated that relocation is the long term adaptation strategy to minimise risks due to anticipated impacts of climate change.



République Gabonaise

Contribution prévue déterminée au niveau national – Conférence des Parties 21
31 mars 2015

Contribution de la République Gabonaise

Conformément aux décisions 1/CP.19 et 1/CP.20 et à son plan stratégique de développement le Gabon communique, à travers ce document, sa contribution définie au niveau national (INDC) pour lutter contre les changements climatiques et l'ensemble des informations relatives.

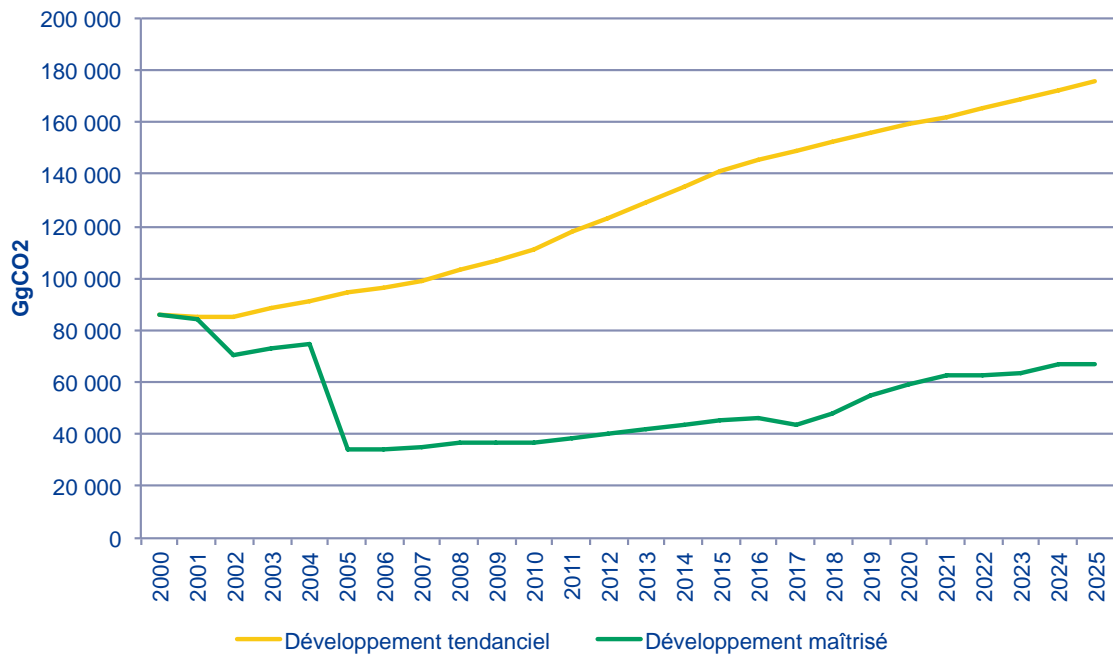
Les éléments repris dans la Contribution Nationale du Gabon sont la synthèse des ambitions et des politiques publiques du Gabon qui, au moment d'opérer un tournant dans son développement, fait le choix de s'engager résolument dans un développement durable, basé notamment sur des émissions de GES maîtrisées.

Cette soumission revêt un caractère doublement important pour le Gabon, en raison d'une part, de l'engagement du Président de la République à mener une politique de développement durable et d'autre part, pour contribuer à l'effort mondial de réduction de la hausse de la température.

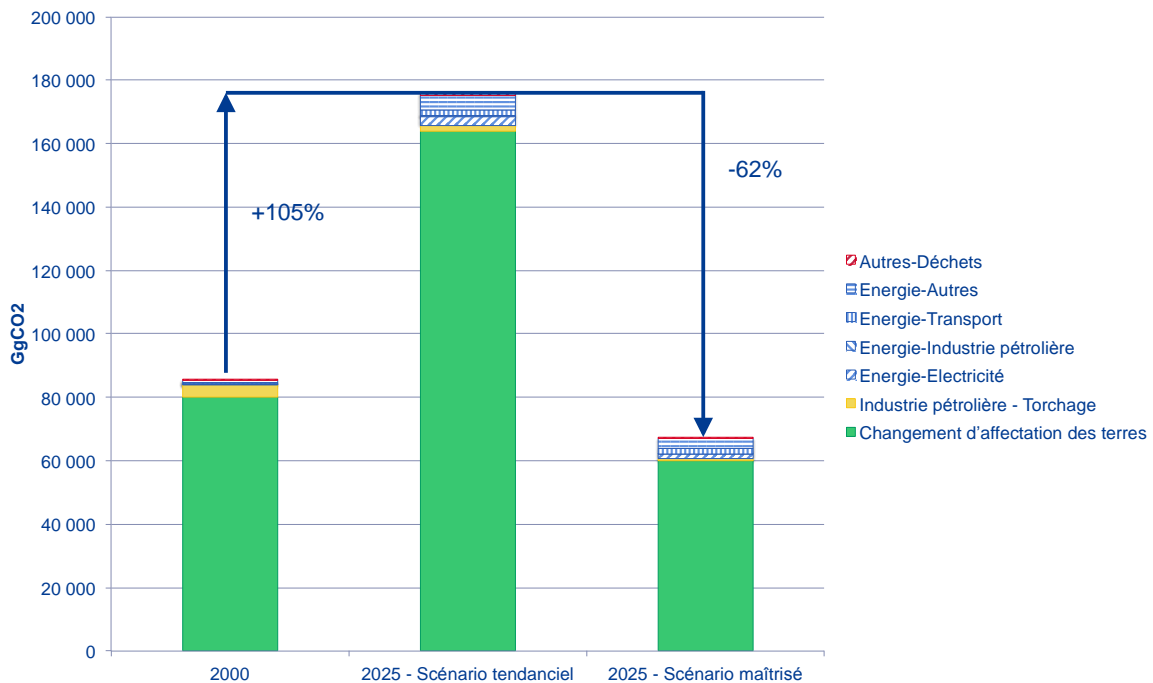
Type d'engagement	Réduction par rapport à un scénario de développement non maîtrisé
Périmètre	Ensemble des émissions de GES hors stockage de carbone dans la biomasse forestière
GES	CO ₂ , CH ₄ , N ₂ O (HFC, PFC, SF ₆ et NF ₃ seront couverts ultérieurement)
Année de référence	2000
Période	2010-2025 (période du Plan Stratégique Gabon Emergent) Ces analyses seront prolongées sur 2030, voire 2050 dans le cadre des études complémentaires qui seront menées avant la COP21
Niveau de réduction	Au moins 50% de réduction des émissions par rapport au scénario de développement non maîtrisé en 2025
Crédits carbone	Pas de réduction à partir d'achats de crédits carbone hors Gabon



Cumulés, les engagements du Gabon doivent permettre de réduire les émissions de GES de plus de 1 500 000 GgCO₂ sur 2010-2025, soit 65% par rapport au scénario tendanciel.



En 2025, les gains représentent de l'ordre de 62% par rapport au scénario tendanciel.



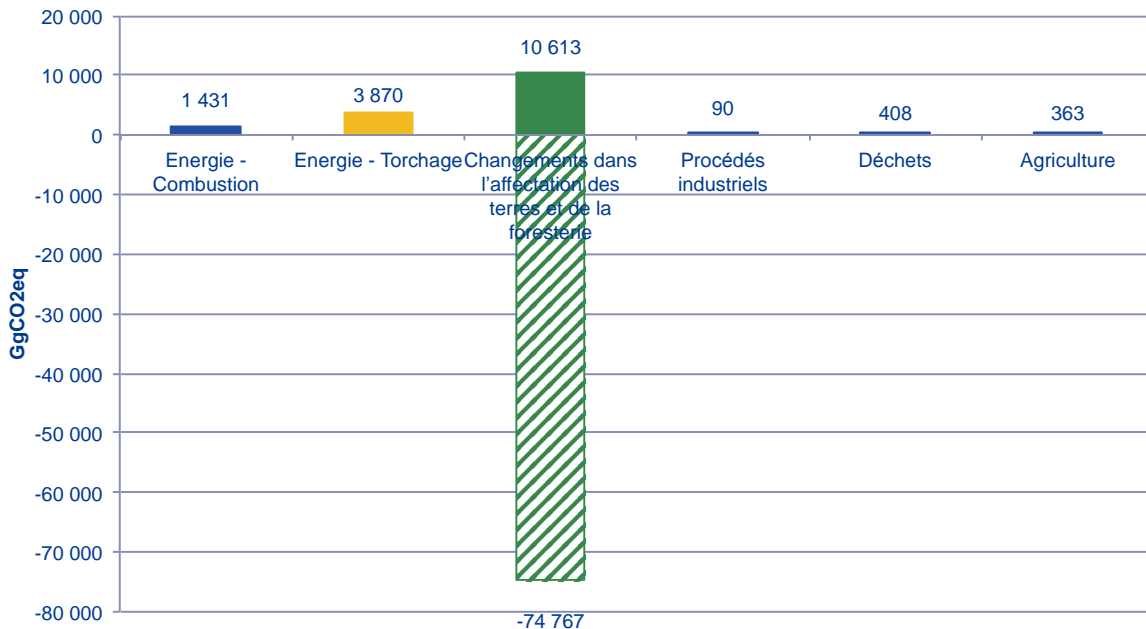
Cette soumission sera enrichie d'ici à la Conférence pour le Climat d'annexes détaillant plus précisément les scénarios et les mesures prévues par le Gabon pour suivre et tenir ses engagements.



A. Le profil GES du Gabon

Couvert à 88% par la forêt, le Gabon, comme de nombreux pays forestiers, joue un rôle de « puits » de carbone en absorbant plus de 4 fois plus de CO₂ que ce qu'il émet.

Inventaire des émissions de GES (2000)

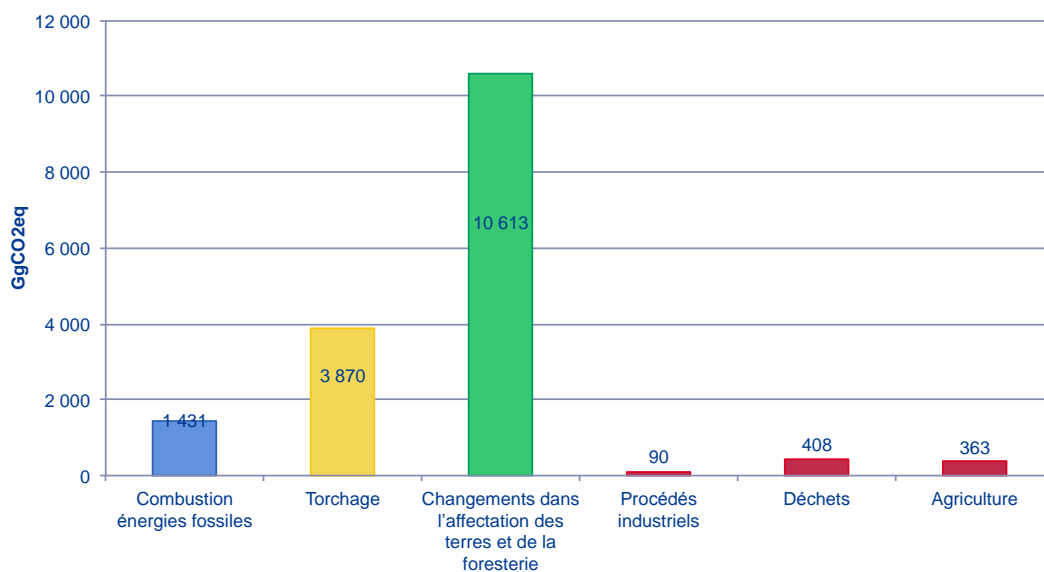


Source: 2ème Communication Nationale

Les nombreuses mesures déjà prises par le Gabon (Code forestier en 2001, création de 13 parcs nationaux couvrant près de 11% du territoire en 2002, etc.) concourent toutes à pérenniser le rôle joué par la forêt gabonaise dans le stockage de carbone.

Hors stockage de carbone dans la biomasse, le profil GES du Gabon est le suivant :

Inventaire des émissions de GES (2000)



Source: 2ème Communication Nationale

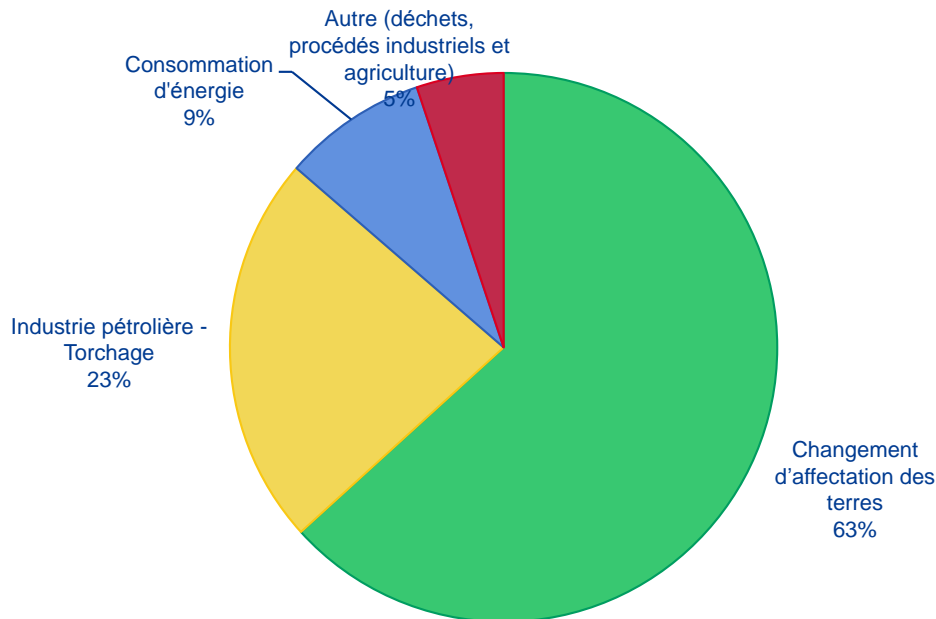


B. Philosophie des engagements du Gabon

Le Gabon ne souhaite pas limiter sa politique Climat à la simple conservation de forêts, à l'aide de mécanismes de financement internationaux. Cette logique de rente obérerait son développement économique et social en l'asservissant à des mécanismes extérieurs, sans lien avec l'économie réelle.

C'est pourquoi les engagements pris par le Gabon portent exclusivement sur ses émissions de GES **hors stockage de carbone par la biomasse**.

Sur ce périmètre restreint, les émissions du Gabon se répartissent de la manière suivante :



Source: 2ème Communication Nationale

Pays en développement et en croissance démographique, le Gabon ne peut s'engager sur une réduction en valeur absolue de ses émissions de GES, mais bien sur une maîtrise de celles-ci dans le cadre de son développement.

Les sous-jacents pris en compte sont :

- une croissance démographique de 2,5% par an ;
- une croissance économique (hors secteur pétrolier) de 10% par an à partir de 2010.

Deux scénarios d'émissions de GES ont donc été élaborés :

- Un scénario « tendanciel » qui correspond à un développement économique non maîtrisé ;
- Un scénario « maîtrisé » prenant en compte toutes les politiques publiques engagées après 2000 telles que le code forestier, les parcs nationaux, le plan national de réduction du torchage, la planification stratégique du PSGE avec son développement industriel à faible intensité de carbone, le plan Climat, la mise en œuvre d'un mécanisme de marché induit par la Loi portant Orientation du Développement Durable au Gabon et l'adoption prochaine du Plan National d'Affectation des Terres.



C. Changement d'affectation des terres

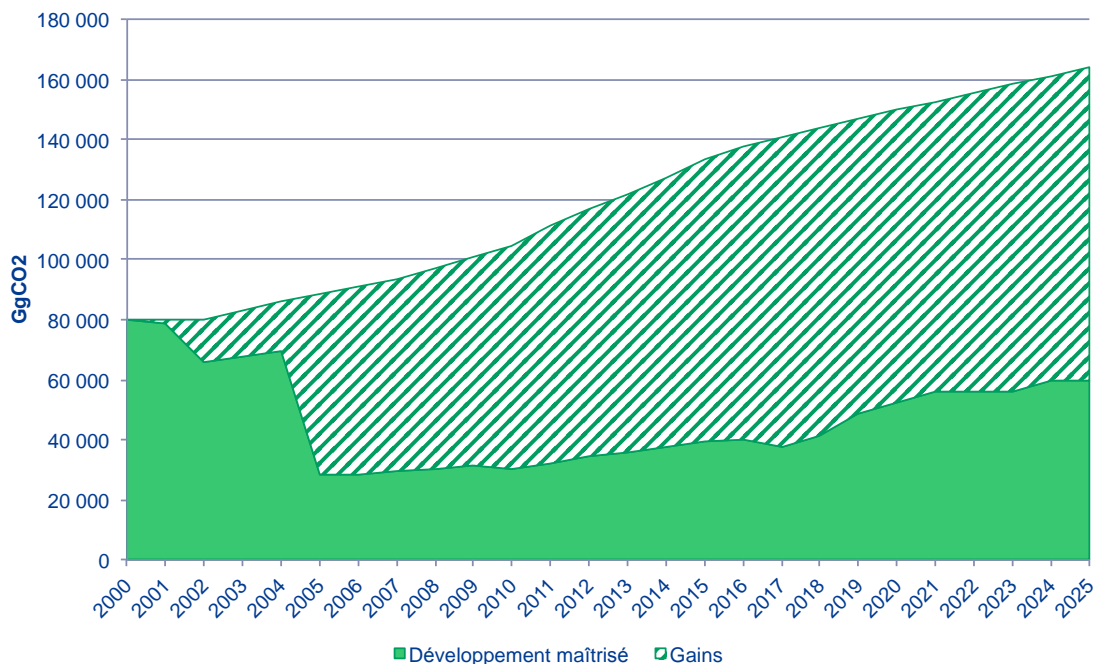
Avec plus de 60% des émissions directes, l'occupation du sol et son corollaire, le changement d'affectation des sols, jouent un rôle crucial dans l'atteinte des ambitieux objectifs de réduction des émissions de GES que le Gabon s'est fixé.

Les principales hypothèses qui sous-tendent le scénario de développement non maîtrisé (ou tendanciel) sont :

- l'augmentation progressive observée depuis 1950 des superficies des permis forestiers de la côte vers les formations forestières climaciques de l'intérieur du pays va s'accroître ;
- l'accroissement démographique va induire des besoins alimentaires de plus en plus croissants occasionnant le développement de cultures industrielles entraînant une perte moyenne de 175 tonnes de carbone par hectare.

Par rapport à cette évolution, le scénario de développement maîtrisé repose sur :

- l'adoption d'un Code Forestier qui pousse les forestiers à étendre leurs rotations de 15 ans à 25 ans, avec des taux de dégâts inférieurs ;
- la création de 13 parcs nationaux en 2002 qui interdit l'exploitation forestière dans de vastes zones du territoire, suivie en 2012 par des restrictions sur de vastes zones de la province de l'Estuaire ;
- l'adoption d'un Plan National d'Affectation de Terre (PNAT) permettant d'allouer de manière optimale les zones aux différents usages, en excluant les forêts intactes, les forêts à haute valeur de conservation et les forêts particulièrement riches en carbone.



En prenant en compte les émissions liées à l'exploitation forestière (qui n'étaient pas incluses dans l'inventaire national des émissions de GES), ces différentes mesures permettront de réduire les émissions de GES de plus de 1 500 000 GgCO₂ sur 2010-2025, soit 68% par rapport au scénario tendanciel (63% en 2025).

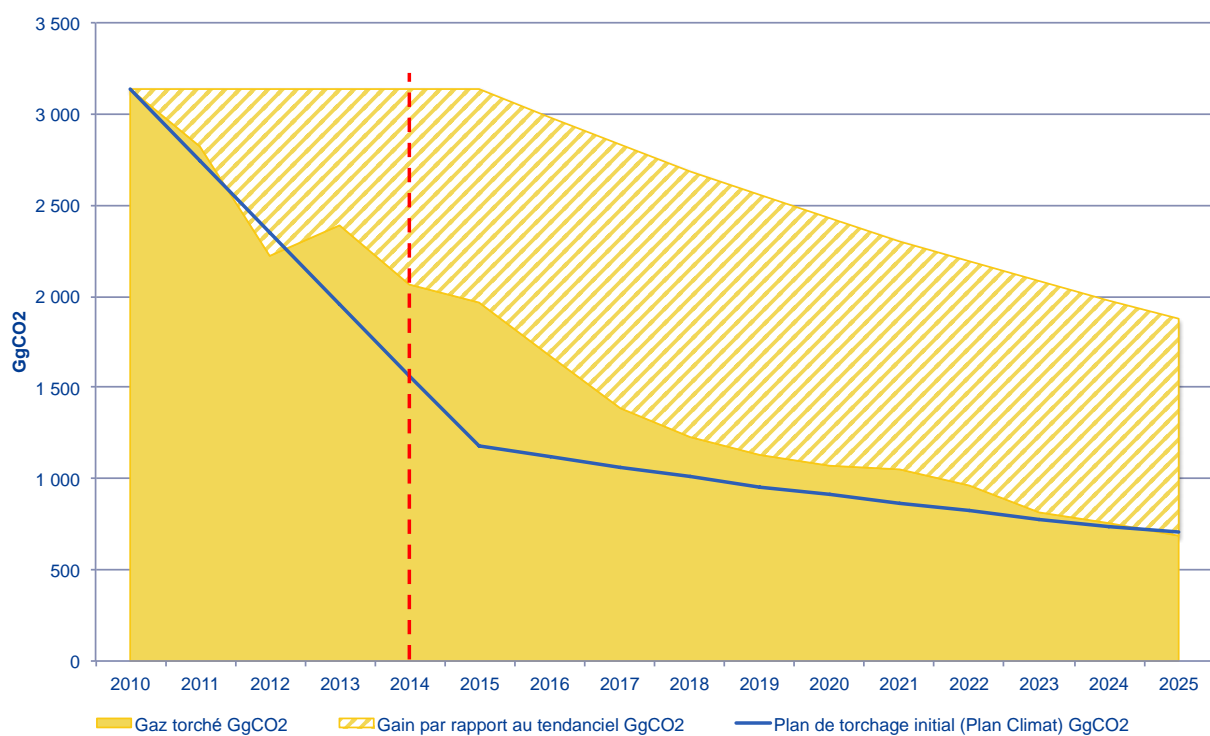


D. Industrie pétrolière - Torchage

Représentant 23% des émissions directes en 2000, les émissions liées au torchage du gaz associé dans la production pétrolière ont fait l'objet de plusieurs mesures.

Ces mesures sont entre autre, l'adhésion en 2007 à l'initiative « Global Gas Flaring Reduction » (GGFR) de la Banque Mondiale, la promulgation en 2014 de la loi N° 011/2014 portant réglementation du secteur des hydrocarbures en République Gabonaise interdisant le torchage en continu au Gabon et ce, cadrant avec la participation du Gabon dès cette année à l'initiative « Zéro Torchage de Routine d'ici 2030 » lancée par le GGFR.

Ces mesures ont déjà un impact très significatif sur les émissions de GES.



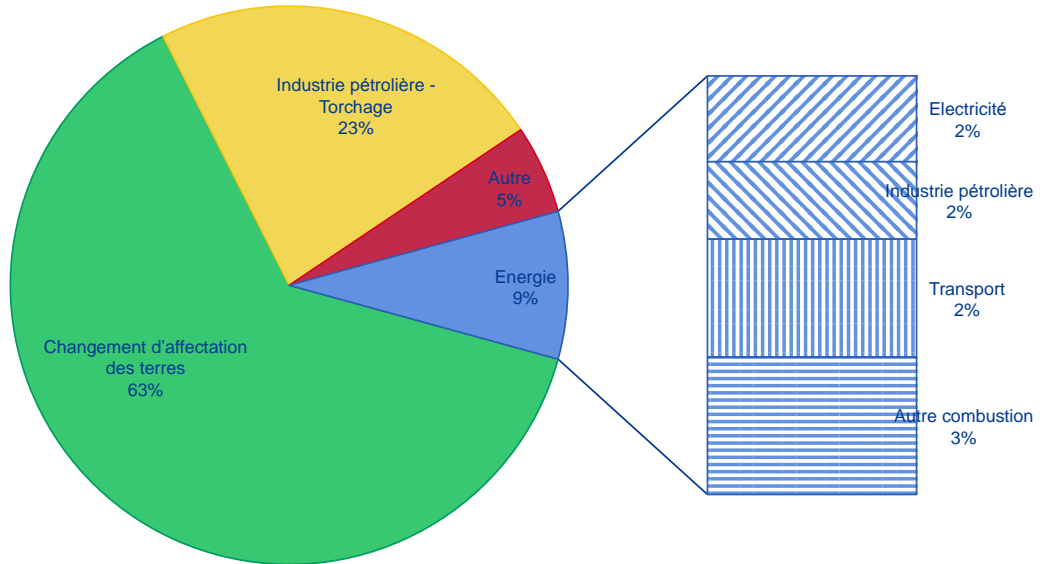
Sur la période 2010-2025, cette politique volontariste permettra de réduire les émissions de GES de 17 341 GgCO₂, soit 41% des émissions (63% en 2025).

Les principaux moyens de mise en œuvre de ce plan de réduction au Gabon que sont la réinjection et la production d'électricité impliquent des investissements particulièrement en unité de compression. Cet investissement entre dans le cadre des « coûts pétroliers » c'est-à-dire des dépenses supportées par les opérateurs auxquelles le Gabon reconnaît un droit de récupération sur la zone d'exploitation tel qu'indiqué dans le code des hydrocarbures gabonais. Ceci équivaut donc à un remboursement de l'ensemble de ces coûts aux opérateurs par le Gabon.



E. Energie

Les émissions liées à la combustion locale d'énergies fossiles représentent le 3ème poste d'émissions.



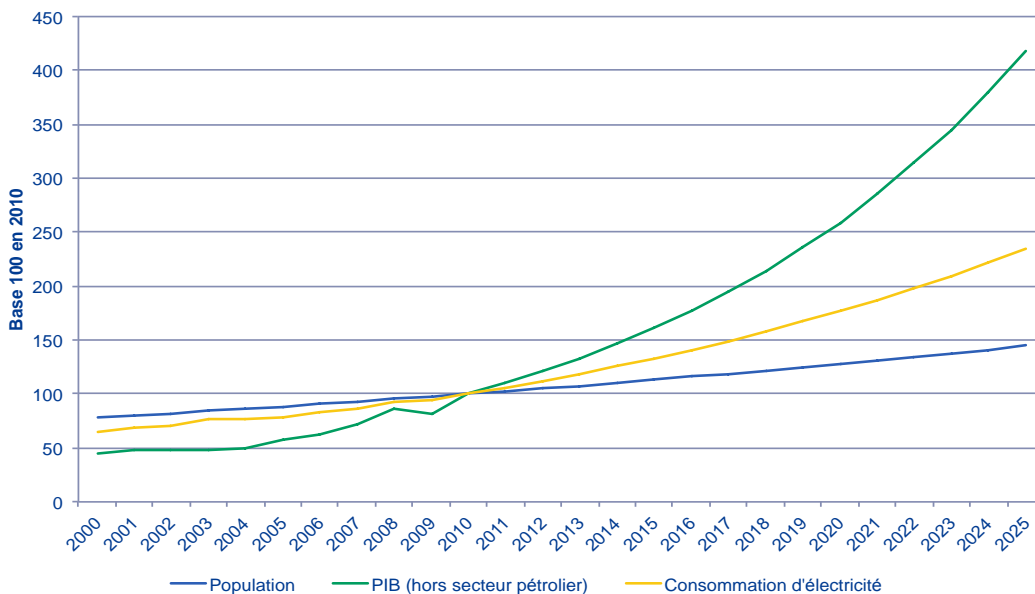
1. Electricité

La maîtrise des émissions de GES liées à la production et à la consommation d'électricité dépend principalement de deux types de mesures :

- Une efficacité énergétique accrue de l'économie ;
- Le développement de moyens de production décarbonés.

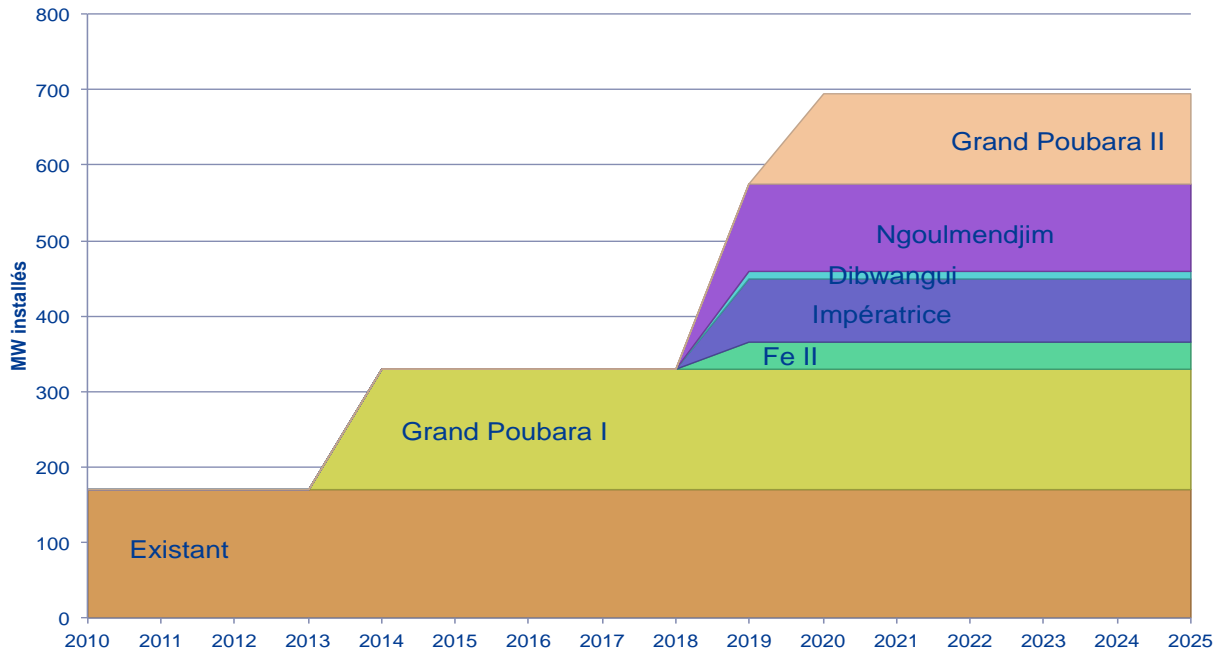
Une analyse historique sur la période 2000-2010 montre que l'efficacité énergétique de l'économie gabonaise s'est améliorée en moyenne de 3,8% par an.

Le Gabon souhaite poursuivre sur cette lancée et continuer à améliorer l'efficacité énergétique sur cette base, avec une cible d'environ 4 000 GWh consommés à horizon 2025.

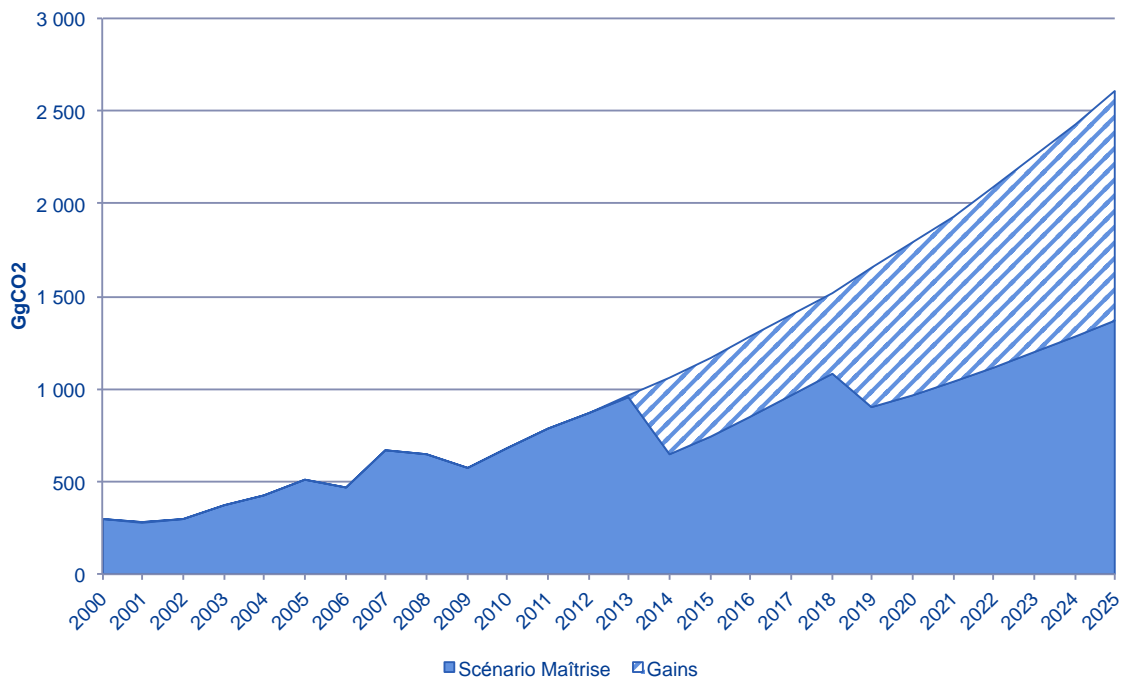




Sur cette base, le Gabon a développé un plan ambitieux de développement de l'hydroélectricité, avec comme objectif d'assurer à horizon 2025 une fourniture de l'électricité basée à 80% sur l'hydroélectricité et 20% sur le gaz.



Sur cette base, ce plan permettra de réduire les émissions de GES de 9 000 GgCO₂ sur 2010-2025, soit 31% par rapport au scénario tendanciel (48% en 2025).



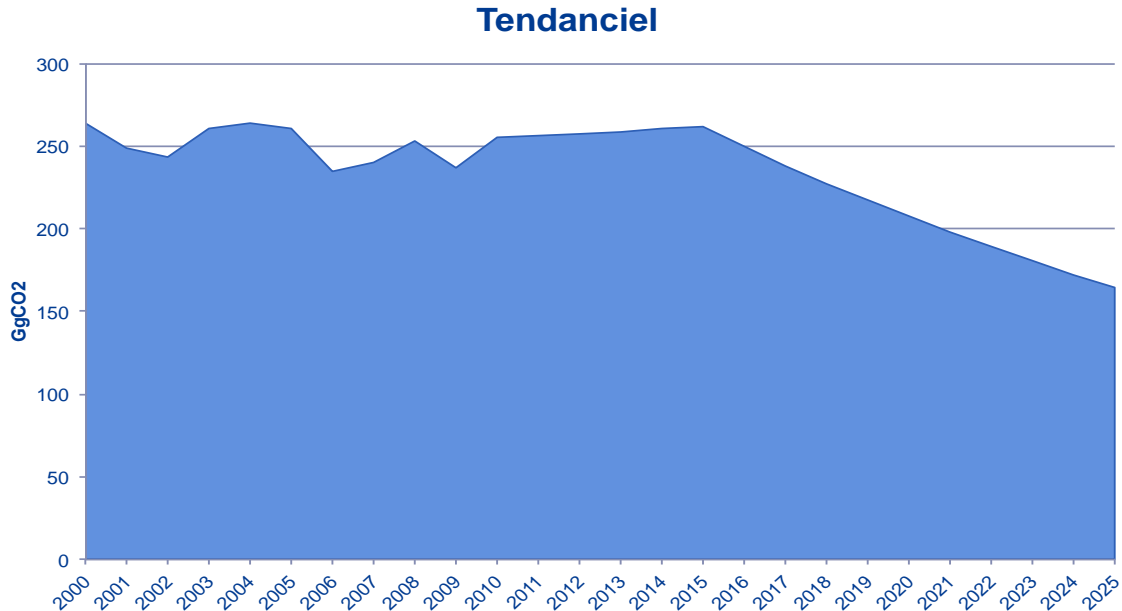
Ces capacités de production permettront également d'exporter de l'ordre de 5 000 GWh sur la période 2010-2025.

Enfin, le Gabon développe également un plan d'électrification solaire des villages isolés. Ce plan permettra d'améliorer l'accès à l'énergie des zones rurales sans recours aux énergies fossiles.



2. Industrie pétrolière – Consommation d'énergie fossile

Les émissions de GES des industries énergétiques hors électricité sont dues à l'industrie pétrolière. Ces émissions suivent donc la courbe de la production pétrolière, comme le montre le graphique suivant.

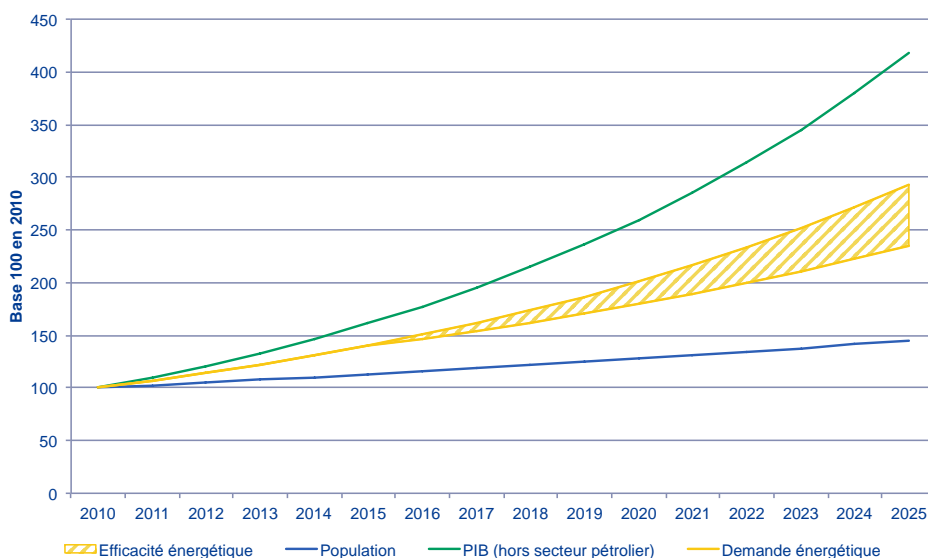


Compte-tenu des faibles enjeux relatifs, le Gabon n'a pas d'engagement de réduction sur ce secteur.

3. Transport

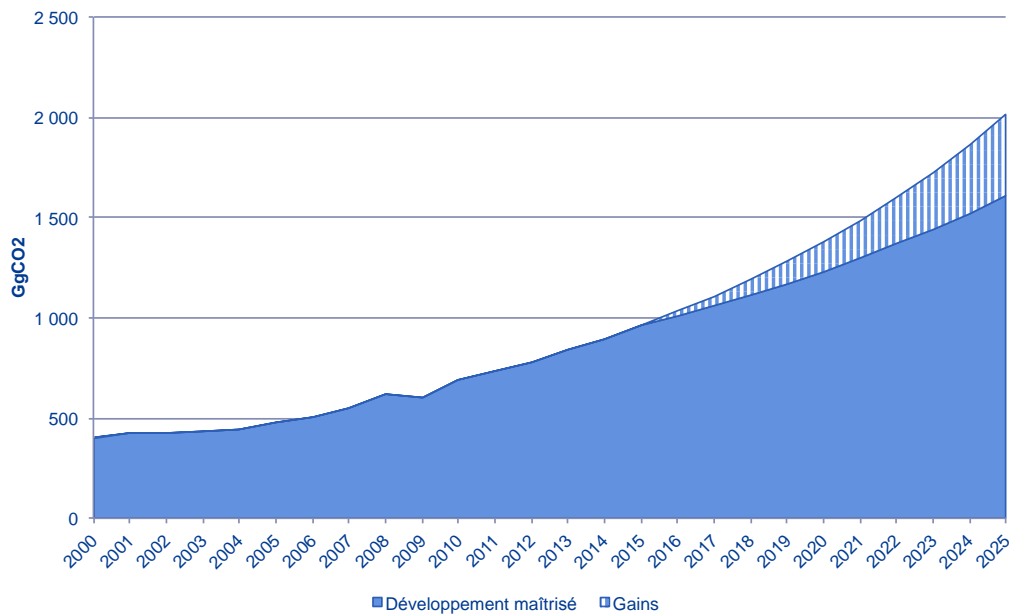
Les émissions dues au transport ne représentent en 2000 que 2,4% des émissions (mais 20% des émissions énergétiques). Si ce secteur n'a pas encore fait l'objet d'étude macroscopique complète, de nombreux projets sont prévus, qu'il s'agisse de projets d'infrastructures (avec de nombreuses routes planifiées), de développements de services de transport en commun (notamment à Libreville, pour lutter contre la congestion) ou des évolutions de la législation (par exemple l'interdiction de l'importation de véhicules de plus de 3 ans).

En l'absence de données complémentaires, le Gabon prend l'engagement de maîtriser la hausse des consommations d'énergie liées au transport à 80% du scénario tendanciel en 2025.





Sur cette base, ce plan permettra de réduire les émissions de GES de près de 2 000 GgCO₂ sur 2015-2025, soit 8% par rapport au scénario tendanciel (20% en 2025).



4. Autres consommations d'énergie

Cette section reprend les consommations d'énergie (hors électricité) de l'industrie (hors industrie pétrolière), des commerces et institutions (notamment l'administration), des ménages, de l'agriculture, de la pêche et de l'exploitation forestière.

Là encore, aucune étude macroscopique n'est disponible mais suivant la philosophie générale de son développement, le Gabon s'engage à contenir la croissance de ces émissions.

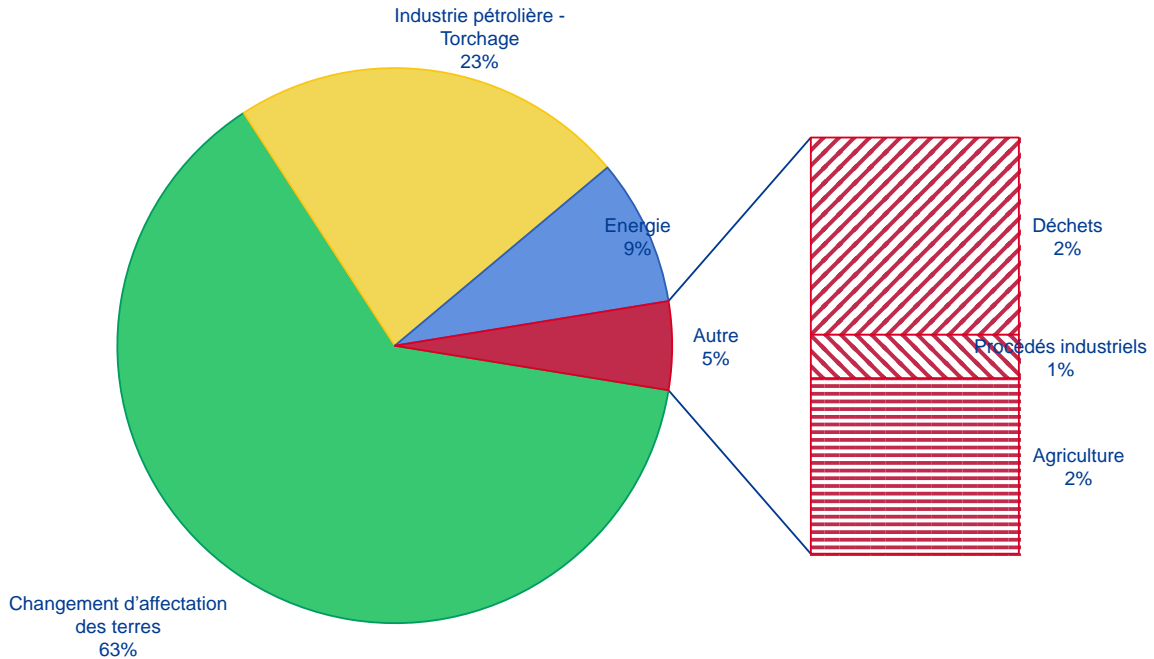
Dans le scénario de développement non maîtrisé, l'évolution des émissions de GES suit l'évolution du PIB, alors que dans le scénario de développement maîtrisé, l'intensité carbone du PIB diminue de 2% par an.

Sur cette base, cet engagement doit permettre de réduire les émissions de GES de 3 500 GgCO₂ sur 2015-2025, soit 8% par rapport au scénario tendanciel (18% en 2025).



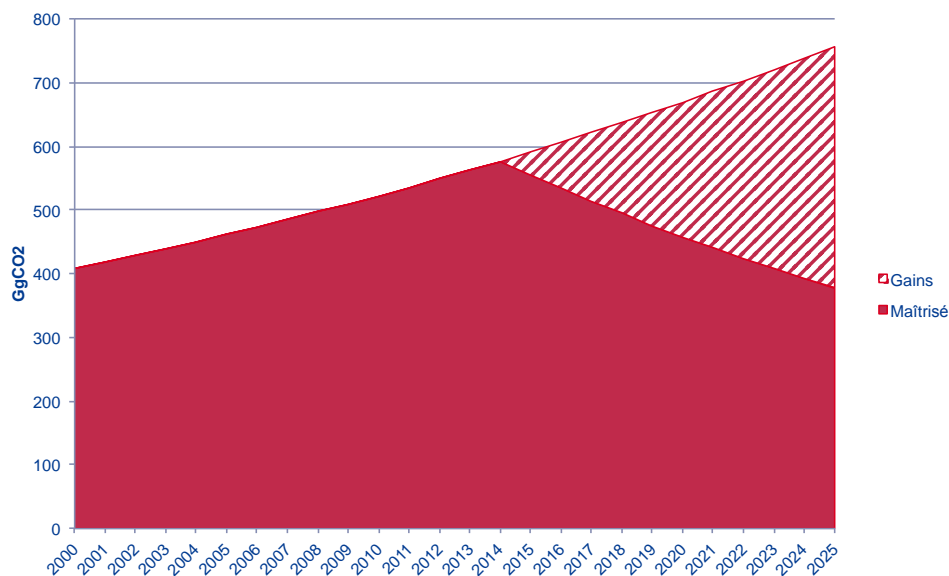
F. Autres émissions de GES

Les émissions liées aux déchets, aux procédés industriels (cimenterie) et à l'agriculture représentent le 4^{ème} poste d'émissions.



1. Déchets

Le Gabon s'engage à réduire de moitié les émissions de GES liées au traitement des déchets et eaux usées à horizon 2025. Compte-tenu de l'évolution attendue de la population, cet engagement doit permettre de réduire les émissions de GES de plus de 2 000 GgCO₂ sur 2015-2025, soit 16% par rapport au scénario tendanciel (50% en 2025).



2. Procédés industriels (cimenterie) et agriculture

En l'absence de précisions, ces secteurs sont exclus de la présente contribution.



G. Adaptation

La vision du Gabon en matière d'adaptation repose sur l'intégration de cette composante dans un schéma d'investissement cohérent basé sur la stratégie de développement du pays, plutôt que sur des aides ou subventions ponctuelles isolées sans lien avec ladite stratégie.

A cet effet, le Gabon s'est doté notamment d'une Stratégie Nationale d'Adaptation du littoral face aux effets des changements climatiques. Celle-ci se décline au travers de mesures visant à une gestion intégrée de la zone côtière par la mise en place d'un cadre juridique approprié, l'acquisition d'outils de surveillance et enfin la formation et l'information.

Par ailleurs, les orientations générales de cette stratégie préconisent la réalisation d'un schéma d'aménagement du milieu urbain côtier, la promotion des activités génératrices de revenus liés aux écosystèmes marins et côtiers. A cela, il faut ajouter un dispositif comprenant des projets de conservations des mangroves pour la protection du littoral, la protection des espèces, la mise en place d'installations spécifiques pour la réception et la gestion des déchets, le suivi de la nidification des tortues marines et la création d'un observatoire du littoral et de l'environnement marin.

Les villes de Libreville et Port-Gentil, particulièrement exposées, font l'objet de mesures de protection sur le littoral par des barrières physiques et des travaux de réhabilitation des berges. La zone économique de l'île Mandji bénéficie, quant à elle, d'un surélévement.

Cette stratégie consacre l'engagement du Gabon à agir contre les changements climatiques en prenant en compte l'adaptation de son territoire aux effets de ceux-ci.

H. Financement

Comme indiqué au paragraphe B « Philosophie des engagements du Gabon », le pays a engagé à la fois **des mesures ou réglementation sectorielles** (code forestier, création des parcs nationaux, plan national de réduction du torchage, interdiction d'exportation des grumes, etc.) comme une **réglementation encadrant le fonctionnement général de l'économie**, en application de la Loi portant Orientation du Développement Durable.

Dans tous les cas ces mesures et réglementations ont un impact direct ou indirect sur les émissions de GHG, ainsi que sur d'autres variables du Développement Durable, telles que la biodiversité, les écosystèmes et le capital social et communautaire. En particulier, l'application du mécanisme de marché induit par la Loi portant Orientation du Développement Durable exerce un effet incitatif, comportemental et financier, sur la réduction des émissions de GHG de manière globale sur toutes les activités du pays.

Des études ultérieures permettront de quantifier la réduction des émissions escomptées.

Le mode de financement des mesures d'atténuation et d'adaptation

La Loi portant orientation du Développement Durable prévoit la mise en place d'un **Fonds National de Développement Durable**. La création de ce fonds est à l'étude et se positionnera dans la lignée des Fonds Nationaux Climat qui se développent dans divers pays, en tenant compte des particularités de la stratégie gabonaise. Le Fonds permettra de canaliser et stimuler une partie des flux financiers dédiés à la réduction des émissions et plus largement au Développement Durable : (1) budget de l'Etat, (2) investissements privés, (3) revenus des crédits du marché domestique, (4) apports ou prêts de bailleurs de fonds).



En attendant, les diverses dispositions sectorielles ou réglementations présentées dans ce document sont accompagnées d'une stratégie de financement adaptée à chaque cas ou secteur, qui peut être déclinée sous 4 modalités complémentaires :

- 1) Par le budget de l'Etat,
- 2) Par l'implication du secteur privé intéressé par les opportunités d'investissement qu'offre le potentiel de développement du Gabon,
- 3) Par le fonctionnement de la mesure ou réglementation, qui implique qu'une fois instaurée, elle fonctionne de façon autonome grâce à l'intérêt économique des acteurs privés impliqués (ex : une fois les investissements initiaux réalisés, la réduction des gaz de torchage s'autofinance par les revenus de l'électricité),
- 4) Par l'appui de la Coopération ou d'institutions spécialisées dans la Finance Climat ou dans des programmes techniques sectoriels, qui souhaitent mettre en place un partenariat avec le Gabon.

En dehors de ce mécanisme en voie de construction à la suite de la promulgation de la Loi en août 2014, le Plan Climat en 2013 dénombreait un certain nombre d'autres dispositions réglementaires pouvant potentiellement contribuer financièrement à la réduction des émissions de GHG (certificats verts, système de bonus/malus etc.). Ces possibilités pourront faire l'objet d'études ultérieures, en complément des actions actuellement menées.

Le marché domestique gabonais sur les émissions de GHG

Le Loi portant orientation du développement durable au Gabon instaure un mécanisme vertueux par lequel les activités qui se développent doivent effectuer au préalable un bilan de leurs impacts (l'Etude d'Impact Développement Durable), mener un Plan de Gestion afin de les maîtriser et les réduire, et compenser les effets négatifs incompressibles. Le mécanisme s'inscrit donc dans la logique « mesurer, réduire, compenser », qui sert également de ligne directrice à de nombreuses initiatives internationales de marchés carbone.

La relation avec le Green Climate Fund

Le Gabon s'est enregistré en janvier 2015 auprès du Green Climate Fund et prétend opérationnaliser la relation dans les plus brefs délais, afin de montrer des résultats dans le domaine de la réduction des émissions mais aussi de l'adaptation à la CoP 21.

En effet, la stratégie climat du Gabon est propre au pays et en même temps construite en cohérence avec les tendances internationales, les avancées méthodologiques et les orientations des négociations climatiques et biodiversité. Dans ce cadre, le Gabon prend en charge ses propres choix et recherche en parallèle à établir des partenariats avec des programmes en accord avec la stratégie présentée dans ce document.

Les différents champs d'action à financer en matière de réduction des émissions, en accompagnement des dispositions stratégiques présentées dans cette contribution nationale sont en particulier des projets :

- d'énergie renouvelable, en particulier hydroélectrique,
- de traitement des eaux usées et autres déchets,
- d'efficacité énergétique,
- de transfert de technologies,
- d'affectation des terres, tant en matière de planification de l'aménagement du territoire, comme des projets agricoles et forestiers.

Les développements en matière de financement seront spécifiés dans les Annexes.



I. Elaboration du document

La rédaction de la contribution du Gabon s'est basée sur un ensemble de documents stratégiques dont le Plan Stratégique Gabon Emergent, le Plan National Climat, les plans opérationnels sectoriels et les textes règlementaires en vigueur.

Par ailleurs, le processus mis en place pour cette rédaction a fait intervenir directement les acteurs publics et privés en charge de la mise en œuvre des politiques publiques ou de leur stricte application.

SECTEURS	ACTEURS IMPLIQUES	DOCUMENTS DE REFERENCE
Energie – Electricité	<ul style="list-style-type: none">- Ministère de l'Energie- Programme des Economie d'Energie et d'Eau de l'Etat	<ul style="list-style-type: none">- PSGE- Plan opérationnel Electricité 2011-2016- Contribution du Ministère de l'Energie- Rapport Annuel 2013 SEEG
Hydrocarbures	<ul style="list-style-type: none">- Ministère du Pétrole- Ensemble des opérateurs pétroliers en production (Total, Shell, Perenco, Addax, Maurel&Prom, CNR I et Vaalco)	<ul style="list-style-type: none">- PSGE- Plan de réduction du torchage par opérateur- Loi N° 011/2014 portant réglementation du secteur des hydrocarbures en République Gabonaise
Agriculture	<ul style="list-style-type: none">- Ministère de l'Agriculture- Coordination du Programme Graine- Olam Gabon	<ul style="list-style-type: none">- PSGE- Document SIG sites occupés par OLAM
Forêt	<ul style="list-style-type: none">- Agence Nationale des Parcs Nationaux	<ul style="list-style-type: none">- PSGE- Etudes et rapports sectoriels- Plan National d'Affectation des Terres- Code forestier
Infrastructures	<ul style="list-style-type: none">- ANGTI	<ul style="list-style-type: none">- PSGE- Schéma d'Aménagement et de Développement du Territoire- SDNI



**Department of Water Resources,
Ministry of Environment, Climate
Change, Forestry, Water and Wildlife,
7, Marina Parade
Banjul, The Gambia**



Message from Honourable Pa Ousman Jarju, Minister, Ministry of Environment, Climate Change, Forestry, Water and Wildlife

The Republic of The Gambia is fully committed to the multilateral process under the UNFCCC and will continue to work with all Parties to negotiate and adopt a New Climate Agreement in Paris in December 2015 that will be in line with keeping global warming below 2°C to 1.5°C.

Following the decision at COP 19 in Warsaw to invite all UNFCCC parties to develop their Intended Nationally Determined Contributions (INDCs), The Gambia expressed a strong interest in receiving technical support to develop their INDCs and received financial and technical support from the German Government development agency GIZ and the Climate and Development Knowledge Network (CDKN). GIZ and CDKN contracted Climate Analytics to provide technical assistance to the INDC Team of The Gambia.

On behalf of the President of The Republic of The Gambia, Alhagi Yahya A. J. J. Jammeh and on my own behalf, I thank the Government of Germany, the CDKN, GIZ and Climate Analytics of Germany for the financial and technical support.

The collaborative efforts between the Climate Analytics Team and the National INDC Team are commendable and have been found to be mutually beneficial.

Finally, I must thank Mr. Petes Betts of the UK Delegation to the Climate Change Negotiations for all his involvement and efforts in catalyzing the support.

Message from Mr. Alpha Jallow UNFCCC Focal Point of The Gambia Department of Water Resources

The Republic of The Gambia has the honour and pleasure to communicate its intended nationally determined contribution (INDC) as part of the implementation of decisions 1/CP.19 and 1/CP.20 of the Conference of Parties of the UNFCCC.

Capacity to conduct and submit an economy-wide emissions reduction targets for The Gambia is limited. Individual baselines for each sector were developed, using a range of GDP growth scenarios. The medium scenario assumes growth rates of 5.5% until 2016 and 4.5% from 2017. For population projections the UN population prospectus 2012 medium fertility scenario was used. Individual assumptions were made for the mitigation options/activities in different sectors

Treatment of the Land Use Land Use-Change and Forestry (LULUCF) emissions category has not been considered in the INDC. Excluding LULUCF and for Low Emissions Scenario, overall emissions will be reduced by about 44.4% in 2025 and 45.4% in 2030.

INTENDED NATIONALLY DETERMINED CONTRIBUTION OF THE GAMBIA

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1: INFORMATION TO FACILITATE CLARITY, TRANSPARENCY AND UNDERSTANDING

INTENDED NATIONALLY DETERMINED CONTRIBUTION						
1.1: Commitment Period	2021 to 2025					
1.2: Commitment Type	Activity/Sector Based					
1.3: Base Year	2010					
1.4: Emissions reduction targets	Mitigation activity	Description	Unconditional	Conditional upon*		Reduction Gg Co2e in 2025
				FS	TT	
	Afforestation	Plant trees on communal lands to increase forest coverage	✓			275.4
	Nerica Upland Rice	Reduce methane emissions from flooded rice fields by replacing them with efficient dry upland rice		✓	✓	397.7
	System of Rice Intensification	Reduce methane emissions through water management, less flooded areas, reduced fertilizer usage		✓	✓	707.0
	Reduce Transmission Losses	Refurbish and upgrade the national grid (from 33Kv to 132Kv) to reduce losses		✓	✓	98.7
	Renewable Energy	Install solar PV, wind power and hydro-electric power plants	✓			78.5
	Efficient Lighting	Substitute incandescent light bulbs and raise awareness in the residential sector		✓	✓	42.9
	Solar Water Heating	Install solar water heating facilities on public buildings and support them for hotels and the residential sector		✓	✓	19.3
	Extended Renewable Energy and Energy Efficiency	Energy saving appliances and additional hydro-electric, solar PV and wind power capacities		✓	✓	121.7
	Efficient Cook-stoves	Reduce firewood and charcoal consumption and the overuse of forest resources		✓	✓	287.6
	Vehicle Efficiency Standards	Reduce fuel consumption through efficiency standards			✓	114.0
	Methane Capture and Flaring	Remove methane emissions from landfills		✓	✓	237.0
	Recycling and Composting	Reduce methane emissions from anaerobic decomposing of organic matter by composting and reduce waste generation by recycling		✓	✓	2.7
*FS= financial support, TT= technology transfer						
1.5: Scope and Coverage	<ol style="list-style-type: none"> The target is individual/sector based Sectors/Categories covered are Agriculture, Energy, Industrial Processes and Product Use (IPPU), Transport, and Waste Management. 					

	3. Gases covered are Carbon Dioxide (CO ₂), Methane (CH ₄), Nitrous oxide (N ₂ O), Nitrogen Oxides (NOx), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulfur hexafluoride (SF ₆), and Nitrogen Trifluoride (NF ₃).
1.6: Assumptions	This INDC was prepared using 100 year Global Warming Potentials (GWPs) from the IPCC 4th assessment report, the IPCC 2006 greenhouse gas inventory methodologies, and the 2013 IPCC KP Supplement.
1.7: Use of market mechanism	Gambia has so far not benefited from the international market mechanisms under the Kyoto Protocol. The Gambia does not plan to achieve any of its commitment by buying certificates from any potential new market mechanisms. The Gambia would be a host country of projects from any international climate mechanism aiming at securing the protection of the planet by meeting standards that deliver real, permanent, additional and verified mitigation outcomes, avoid double counting of emissions. Elements of the INDC that are conditional to international support could potentially include projects that are registered under the new market mechanism established under the Convention. Furthermore, The Gambia supports the continuation of the CDM established under the Kyoto Protocol and its continuation under the new agreement.
1.8: Fairness and Ambition	According to preliminary inventory data for 2010 under the Third National Communication (<i>being developed</i>), the Gambia represented below 0.01% of the global emission and as such its contribution to climate change has always been marginal. At first sight it seems rather unfair to ask a country like The Gambia to contribute to the global emission reduction efforts, which implies that resources to be allocated to poverty reduction and development priorities will be arbitrated to take into account the requirements of the implementation of the Paris Agreement. The Gambia has always shown a progressive standpoint and commendable leadership in the climate change negotiations, as the implications of the current level of mitigation ambition is particularly low and likely to pose tremendous challenges for countries like Gambia. Agriculture, Energy, Water Resources, which are vital sectors for the Gambian economy will severely suffer if global and deep cut do not occur in a near future. For this reason, The Gambia took the leadership and joined the call in 2011 for a universal mobilization of efforts to tackle climate change allowing that global actions protect the future of the most vulnerable countries. By presenting this INDC, the Gambia would like to provide a moral voice for all responsible and capable countries to undertake actions that are proportionate for their responsibilities and capabilities not only for themselves, but for the whole global community. The Gambia is an LDC and according to the Lima Call for Action, it is not mandatory for LDCs to have quantified or quantifiable targets. But this INDC has quantified and quantifiable commitment which go beyond the fair share of The Gambia. Fairness in the context of the most vulnerable countries INDC also relates to the way the Paris Agreement will deal with their adaptation needs in a post 2020 world.
1.9: Finance	Financial support from all sources will be needed for the implementation of this INDC. An assessment of the implementation options is needed between 2016 and 2018. Potential sources will include, the National Budget and proposed National Climate Fund, the financial mechanism of the Convention, bilateral and multilateral sources, other non-Convention financial and investments sources, as well as international and domestic private finance sources. All these will be facilitated and enabled by current and proposed public policy and regulatory frameworks as indicated in the section 5, as well national mobilization of finance and investments where possible.

1.10: Implementation	The Government of The Gambia has in place legislative and policy instruments to address climate change and some of these instruments have been used in the development of this INDC and will be used for its implementation (see Section 5).
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2: NATIONAL CIRCUMSTANCES

The Gambia signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and ratified it in 1994. By so doing, The Gambia is implementing the Climate Change Convention and its Kyoto Protocol based on its national circumstances, particularly to support its development policies and programmes. Since its ratification of the Convention, The Gambia has taken very important steps to face the challenges and address the effects of climate change through the development, submission and implementation of her National Communications, the National Adaptation Program of Actions (NAPA), the National Capacity Self Assessment (NCSA) and the Nationally Appropriate Mitigation Actions (NAMA). These documents have been developed to be in line with the national policies and programmes including VISION 2020, the PAGE and relevant sectorial policies, some of which are discussed in Section 5.

As one of the Least Developed Countries (LDCs) parties to the UNFCCC, The Gambia is among the nations that are the least responsible for climate change, particularly vulnerable to its impacts, but the most progressive for ambitious international climate action. As such, The Gambia has been calling for all countries to lead by example, making no exception for the development of its INDC. It has often highlighted the opportunities arising out of the process, allowing countries to leapfrog the ‘dirty development’ phase, combining enhanced development and growth with an environmentally sustainable path.

Following the decision at COP20 in Warsaw to invite all UNFCCC parties to develop their Intended Nationally Determined Contributions (INDCs), The Gambia expressed a strong interest in receiving technical support to develop their INDCs and received financial and technical support from the Governments of Germany and the United Kingdom. The German Government development agency, GIZ, and the Climate and Development Knowledge Network (CDKN) provided technical and financial support. GIZ and CDKN contracted Climate Analytics to provide technical assistance to the INDC Team of The Gambia.

This technical report is the result of the technical support provided towards The Gambia’s INDC-development process. The results from this analysis feed into the political process in The Gambia, which ultimately decided on the INDC. The process leading to this technical report and providing additional input towards the political process includes the technical work carried out by the consultants, and a national stakeholder engagement process. To this end, The Gambia carried out national stakeholder consultations on INDC-development in the form of workshops.

Technical inception workshop at the senior technical expert level informed experts on the context and planning of the project and the purpose of the activities; and provided input for the technical analysis regarding challenges and current status in the different sectors. The workshop was attended by 80 experts from ministries, departments, NGOs and the private sector.

Local level sensitization workshops were held at the country's eight local government areas (districts) and stakeholders acquired knowledge on the issues related to climate change, the UNFCCC process and the significance of the INDC; providing input on appropriate mitigation options. About 120 participants in each district and from all local stakeholder groups participated.

Technical training workshop at the senior technical expert level was held to familiarize sector experts in The Gambia with the calculation methods and tools used for the INDC development and to discuss the robustness of assumptions made for calculations and adjust these where needed. The workshop was attended by 25 participants from key ministries, agencies and institutes for the different sectors.

The Climate Analytics Consultants and the National INDC Team collaborated in the technical analysis leading to the development of the INDC. The technical analysis only forms one input into the process of developing the INDC. Although national priorities, development aspirations and technical feasibility were part of the analysis, other considerations influenced priorities and level of ambition. The Technical Analysis Report provides a brief description of the status of activities in The Gambia; a short discussion of the GHG profile of the country and critical sectors; the methodological approach taken for baseline development and mitigation analysis; the results obtained from the analysis per sector and at the national level; and two possible approaches for the formulation of the INDC as an input to the political process. This document guided the formulation of this INDC.

3: METHODOLOGICAL APPROACHES FOR ESTIMATING GREENHOUSE GAS EMISSIONS AND REMOVALS AND CONTRIBUTION

3.1: Baselines

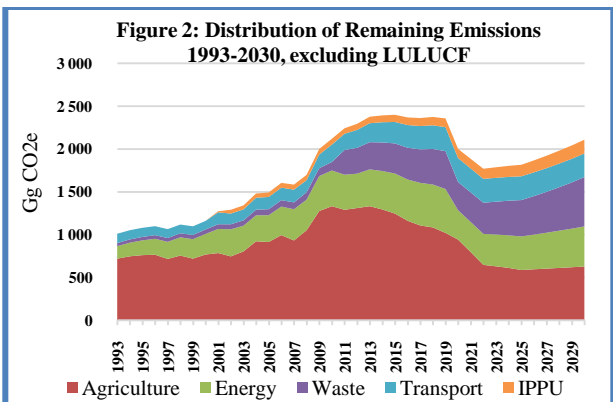
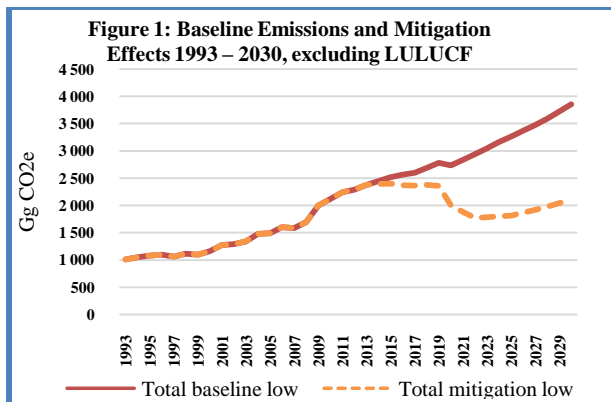
Individual baselines for each sector were developed, using a range of GDP growth scenarios. The medium scenario assumes growth rates of 5.5% until 2016 and 4.5% from 2017. For population projections the UN population prospectus 2012 medium fertility scenario was used. Individual assumptions were made for the mitigation options/activities in different sectors

3.2: Contributions to 2015 agreement

3.2.1: Mitigation

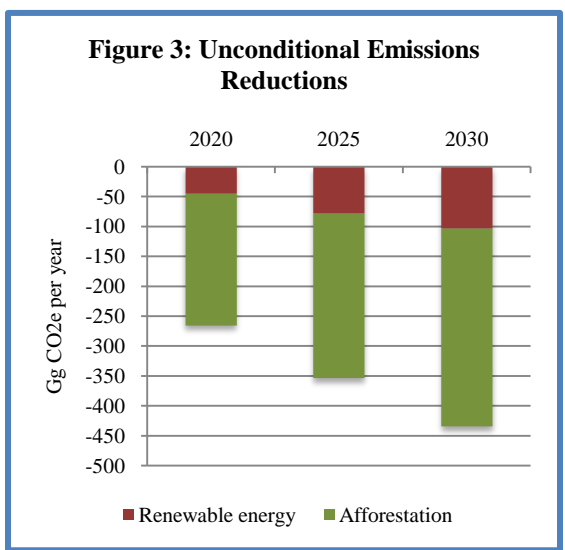
Overall National Reductions

Treatment of the Land Use Land Use-Change and Forestry (LULUCF) emissions category has not been considered in the INDC. Excluding LULUCF and for Low Emissions Scenario, emissions will be reduced by about 44.4% in 2025 and 45.4% in 2030 (see Figures 1 and 2 below).



Unconditional Mitigation Actions

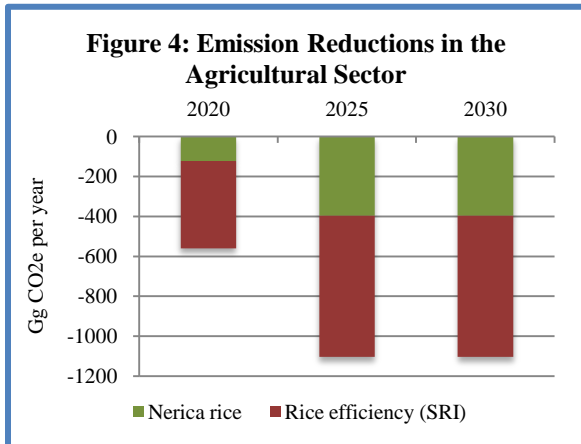
The Republic of The Gambia includes two unconditional mitigation options in its INDC: Firstly, the use of renewable energy sources in lighting, communication and health facilities, and for lifting water from wells and boreholes. Secondly, the Department of Forestry and local communities will continue to plant and care for trees annually. The implementation of renewable energy sources will contribute to greenhouse gas emission reductions of 45.6 GgCO₂e in 2020, 78.5 GgCO₂e in 2025 and 104 GgCO₂e in 2030 whilst afforestation will contribute reductions of 220.3 GgCO₂e in 2020, 275.4 GgCO₂e in 2025 and 330.5 GgCO₂e in 2030 (see Figure 3 to the right).



Emission Reductions at the Sectorial Level

Reductions in the Agricultural Sector

Under the Agriculture sector, two conditional mitigation options (NERICA Rice production and Rice efficiency) have been assessed and reported on in this INDC (see Figure 4 to the right). For production of NERICA upland production in place of Swamp Rice, estimated emission reductions are 124.1 GgCO₂e in 2020, 397.7 GgCO₂e in 2025 and 2030. For the promotion of efficiency in rice production, estimated emission reductions are 437.8 GgCO₂e in 2020, 707.0 GgCO₂e in 2025 and 2030.



Reductions in the Energy Sector

The energy supply mix mainly consists of traditional biomass and petroleum products, with biomass accounting for the vast majority. Petroleum products play an important role in the country's energy supply since it is the main source of fuel for transport and electricity generation, notwithstanding its negative environment consequences. In 2010, Total Energy Supply (TES) in The Gambia was 407,926 tons of oil equivalents (toe) according to UNIDO figures. As shown in Figure below, five conditional mitigation options have been identified and analyzed under the Energy Sector. Combined emissions reductions are 425.7 GgCO₂e in 2020, 541.1 GgCO₂e in 2025 and 629.6 GgCO₂e in 2030. Figure 5 and Table 1 to the right show the emission reductions per mitigation option.

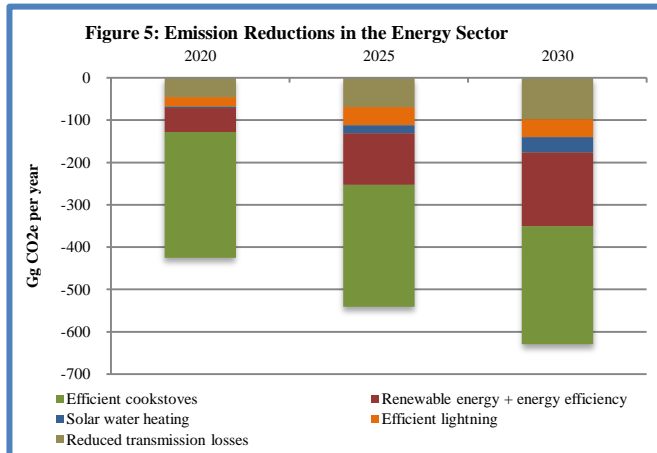
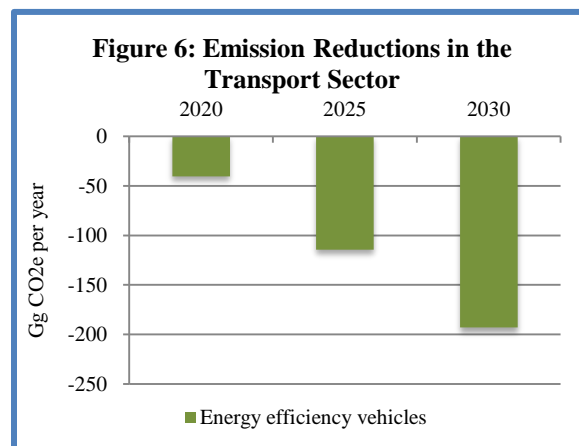


Table 1: Emission Reductions per Mitigation Option in the Energy Sector

Mitigation Options	Projection (GgCO ₂ e)		
	2020	2025	2030
Reduced transmission losses	46.0	69.6	98.7
Efficient lightning	23.1	42.9	41.7
Solar water heating	3.0	19.3	36.4
Renewable energy + energy efficiency	56.4	121.7	174.4
Efficient Cook-stoves	297.2	287.6	278.4

Emission Reductions under Transport Systems

Of the total CO₂ (437.575 Gg) emitted from the Energy Sector in 2010 the Transport sub-sector accounted for 46% (MoE/TNC, 2015). Only one conditional mitigation option was analyzed under the Transport Sector. As shown in Figure 6, deployment of energy efficient vehicles will produce greenhouse gas emission reductions of 40.8 GgCO₂e in 2020, 114.5 GgCO₂e in 2025 and 193.3 GgCO₂e in 2030.



Emission Reductions under Waste Management

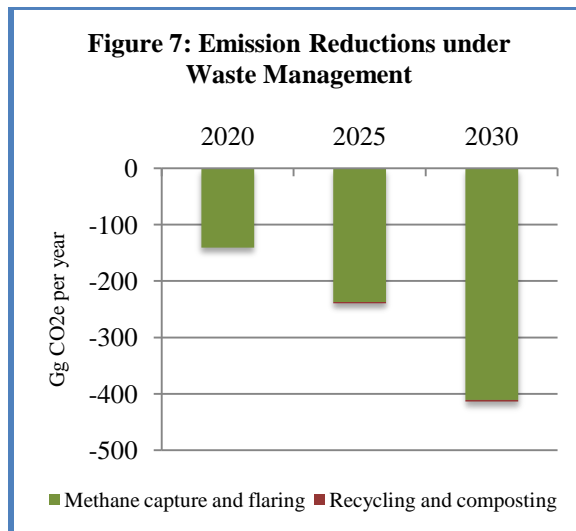
Inadequate waste data is a major issue, regarding both GHG emissions and waste production, for both solid waste and wastewater. Current municipal solid waste generation in The Gambia amounts to approximately 438 tons/day and is expected to reach 1,295 tons/day in 2025 (World

Bank 2012). Waste management is a major concern for Gambian Authorities, given that roughly 90% of waste is currently disposed in open dumps (e.g. Bakoteh Dump Site). This leads to severe environmental consequences (Sanneh et al. 2011), which can be exacerbated by the expected growth

in waste generation volume in the future. Enhancement of the waste collection system is hindered by lack of vehicles. Specialized vehicles are too expensive to buy and maintain for the municipalities who are responsible for waste management. Over 40% of the population lives in the Greater Banjul Area (GBA). As such, the Government included in its NAMA agreed list the implementation of an Integrated Management initiative for solid and liquid waste in the GBA, which is expected to reduce emissions significantly but is also associated with an estimated implementation cost of USD 68 million.

Under waste management, combined greenhouse gas emission reductions of 141 GgCO₂e in 2020, 239.7 GgCO₂e in 2025, and 413.7 GgCO₂e in 2030 will be achieved

through conditional methane capture, and waste recycling and composting. Figure 6 shows the emission reductions per mitigation option.



4: ADAPTATION UNDERTAKINGS

4.1: General

As for all least developed countries in sub Saharan Africa, adaptation constitutes a top priority for the Gambia. However, the Gambia does not see the INDC, as the vehicle to address its adaptation needs in the post 2020 context, which needs careful consideration and assessment. Such assessment will be made in the context of the Gambian NAP process. All necessary efforts will be made to engage the country in the formulation and implementation of a comprehensive transformational adaptation investment plan to protect the country’s high vulnerability against climate change. The Gambia expects that the Paris Agreement will make adequate provision to enable international climate finance support for effective adaptation in the most vulnerable countries.

4.2: Adaptation (national, sub-national and sectoral levels)

In the short-term, for The Gambia to transition to a low-emissions and climate resilient development pathway, Government intends to adopt specific enabling conditions which must consist of national regulations, policies, subsidies and incentives, as well as international market and legal infrastructure, trade and technical cooperation. This will be achieved through intensive and extensive education, awareness raising and development and implementation of socio-economic research as it relates to climate change. Currently, enabling conditions are heavily

weighted towards, and encourage, the prevailing brown economy, which depends excessively on fossil fuels, resource depletion and environmental degradation.

In the medium- and long-term, the Government must continue the mainstreaming of climate change into national development frameworks as achieved for the medium-term strategy – the Programme for Accelerated Growth and Employment (PAGE) and some sectorial policies and strategies (the Agriculture and Natural Resources Policy, the Forest Policy and the Fisheries Strategic Action Plan) by adjusting all national and sectorial policies to take climate change into consideration. With appropriate changes in the policies, including fiscal policy, the fostering of public investments to green key sectors (agriculture, energy, water resources, waste management, etc.); employment of new market-based instruments; greening public procurement; improving environmental rules and regulations, as well as their enforcement; improving trade and aid flows; and fostering greater international cooperation can be easily achieved.

Specific examples of short-term and medium-term activities that The Gambia plans to include in her proposed Low Emissions Climate Resilient Development Strategy (LECRDS) and National Climate Change Action Plan (NCCAP) to implement the LECRDS include but not limited to:

- 1. Improve the Climate and Climate Change Resilient urban and peri-urban infrastructure of the Gambia including (a) water supply infrastructure in Greater Banjul Area; (b) addressing infrastructural deficiencies of Sanitation services in Kanifing Municipality and Brikama Area Council; (c) developing and applying infrastructure construction and management codes/guidelines under climate change; (d) strengthening climate robustness of public and commercial sector buildings in Greater Banjul Area; and (e) improved road infrastructure and drainage systems.** The implementation of this activity will lead to (a) increased access to potable water, integrated water management policy, greater water security for communities, increased protection of infrastructure from extreme climate events; (b) decreased impact of drought on domestic and agricultural water availability; (c) decreased waterborne diseases due to flooding and more sustainable and climate resilient settlements; (d) development and applications of planning codes/guidelines that are climate change oriented (e) strengthened vulnerable infrastructure in GBA; (f) improved resilience of road networks under changing climate; and (g) reduced effect of floods on the Greater Banjul Area (GBA).
- 2. Adapting the Agriculture System to Climate Change in The Gambia** will strengthen diversified and sustainable livelihood strategies for reducing the impacts of climate variability and change in agriculture and livestock sectors of The Gambia. In addition to institutional strengthening, climate change adaptation priorities will be mainstreamed into national agriculture and livestock policies, plans and programmes; value addition of

products will be promoted to complement and support crop diversification; vulnerability and risk assessment tools and agro-climatic monitoring and early warning for food security will be improved; climate information services to the agriculture sector and dissemination to wider rural communities will be promoted; livelihoods and sources of income for vulnerable communities in 5 Administrative Regions of the country will be diversified; sustainable crop intensification will be enabled by introducing innovative crop improvement and management practices; implementation of poultry, small-ruminants and cattle production at the local level will be improved; and sustainable livelihoods and soil and water management interventions to improve vegetative cover and to sustain livelihoods of livestock dependent communities will be expanded and intensified.

3. **The mainstreaming of climate change in all national development frameworks will be continued.** With financial and technical support from the CDKN, climate change issues and risks have successfully been integrated in the Programme for Accelerated Growth and Employment (PAGE: 2012 - 2015) as a crosscutting theme. Some activities identified and included in the Climate Change Priority Action Plan (CCPAP) to implement the PAGE are being implemented and are thus enabling mainstreaming of climate change into the national development process. Development of the follow-up medium-term strategy has started and the following activities will be carried forward.

- **Mainstreaming of Climate Change into Education Curricula:** Education, training and public awareness constitute the first pillar of mainstreaming. The Government enjoyed several achievements in education and the country is on track to achieve the education MDG target for net enrolment in primary education and literacy rate among the population aged 15-24 years. However, the issue of knowledge and education on climate change remains a challenge. Therefore, the Government will continue prioritizing basic/primary education, while expanding access to secondary, higher and tertiary education with emphasis on climate change. Integration of climate change in all education curricula will support the achievement of sustainable development in The Gambia.
- **Integration of Climate Change into Sectorial Policies:** With the understanding that integration is the first step to mainstreaming climate change in national development processes, Government initiated and has completed the integration of climate change into the Agriculture and Natural Resources Policy, the Forest Policy, and the Fisheries Strategy and Action Plan. The integration of climate change in all policies, strategies, plans and programmes/projects will be necessary for mainstreaming climate change. Of particular importance is the integration of climate change into the public budgeting system under the Ministry of Finance and Economic Planning. Taking climate change fully into consideration in the national budgeting system allows climate proofing of all activities and programmes and thus determines allocation of funds to those activities and programmes that are less contaminative.

4. **The planning, development and implementation of an effective disaster preparedness and response strategy in support of climate change adaptation and loss and damage** is a critical activity to develop and implement. Critical gaps and constraints exist in terms of human capacity, low awareness of the economic benefits of disaster risk reduction, low resilience of infrastructure and facilities, inadequate slum upgrade, lack of appropriate building codes and land use planning, and inadequate funding to enable the utilization of disaster preparedness and risk reduction in support of climate change adaptation and future loss and damage. To reduce the risk and vulnerabilities of the country and communities, the proposed activity will:

- Integrate disaster risk reduction with climate change adaptation;
- Strengthen disaster risk reduction institutions through institutional strengthening and capacity building;
- Strengthen disaster risk reduction at the local level;
- Improve and reinforce proper building codes and land use planning;
- Integrate disaster risk reduction into the formal and informal education system and health sector;
- Harmonize and re-align partner interventions towards disaster risk reduction;
- Strengthen the climate change early warning systems; and
- Empower young people as advocates for disaster risk reduction.

5. **Build and strengthen national capacities to promote and facilitate medium and long-term climate change adaptation planning and implementation.** The proposed activity will support national systems to integrate climate and development and to plan effectively and allocate finance, as well as identify appropriate sources of finance and policy mechanisms. The activity will build and strengthen institutional and technical capacities and knowledge brokering for climate change adaptation planning and the integration of adaptation within, or aligned with, current development planning and budgeting processes. The process will

- Identify information and capacity gaps;
- Forge linkages with other on-going initiatives;
- Make tools and approaches available to national partners; and
- Share lessons learned and knowledge.

6. **Climate-proofing of the Urban and peri-urban infrastructure in the Brikama and Greater Banjul Areas to be implemented in phases and divided into:**

Component 1: Water supply, Sanitation and Waste Management;

Component 2: Public works infrastructure (roads, bridges, communication, etc.) in Brikama and Greater Banjul Areas;

Component 3: Climate Resilience of Public and Commercial Buildings in Brikama and Greater Banjul Area;

7. **Enhancing Resilience of coastal and estuarine/riverine economies and livelihoods of the districts in the coastal zone** by reducing their vulnerability to sea-level rise and associated impacts of climate change of Gambia's most important coastal economic development assets, notably the tourism infrastructures of the Kololi coastline and the lowland rice growing landscapes of the districts of Jokadu and Upper Baddibu.
8. **Climate Change Adaptation through large scale ecosystem restoration of the River Gambia Watershed by:**
 - a) Improving disaster preparedness and decrease the effect of disasters at seven hotspots identified under the 2012 study by the National Disaster Management Agency;
 - b) Promoting access to community markets by improving climate resilience of infrastructure and transport through the rehabilitation and development of critical road and transport infrastructure;
 - c) Establishing food processing and preservation plants close to communities and markets;
 - d) Improving long term planning and management through development of national and sub-national land use policies and plans for crop and livestock production; management of agro-pastoral infrastructure and control of transhumances; enrichment and management of rangelands and appropriate farm mechanization and establishing irrigation schemes.
9. **Development and Implementation of the National Climate Policy and Strategy of The Gambia**

The *overall objective* is to contribute to the capability of the government and people of The Gambia to mainstream climate change into development planning. The outcomes include (a) an established national climate change policy; (b) rationalised institutional arrangements and inter-sector coordination mechanisms for climate change; and (c) strengthened decision makers' climate change response capacity. On-going activities include definition of guiding principles and roadmap to develop an overarching policy document; definition of a national climate change policy and Low emissions climate resilient development strategy (LECRDS); institutional analysis, and development of recommendations for institutional arrangements; establishment of climate change related inter-institutional coordination mechanisms; and sensitisation and training on the relationship between climate change and development.

10. Establishment of the National Climate Change Fund of The Gambia.

The development of the Policy and LECRDS of The Gambia has taken into consideration the financial requirements to implement the on-going and proposed activities in the implementation of the Convention, its Kyoto Protocol and the future Climate Region from 2021. The Government of The Gambia, as a matter of priority, intends to create a Gambia Climate Change Fund (GCCF) by:

- a) Conducting detailed analysis of current and future activities and programmes of the LECRDS and the full cost of its implementation;
- b) Designing the GCCF based on the detailed analysis above;
- c) Establishing a multi-stakeholder Task Force to steer the process of establishing the GCCF;
- d) Conducting nationwide stakeholder consultation and sensitization about the Green Climate Fund (GCF), its mandate, and the target date for the launch of operations;
- e) Developing and adopting key policies, guidelines, procedures and templates for the management of the Fund;
- f) Establishing the institutional structures to management the Fund;
- g) Convening a climate finance pledging conference that will include public and private sectors, bilateral and multilateral development partners and investment partners;
- h) Prioritizing climate funding within the national budget and harmonising funding requirements, and efforts to improve the capacity of the funds;
- i) Creating climate change line items and codes in the IFMIS and national budget to allow climate change budgets to be tracked and reported;
- j) Improving the capacities of stakeholders to absorb climate finance;
- k) Standardizing the financial requirements and fiscal calendars of the government and development partners and establishing the processes by which development agency and government resources are provided to the Fund through a joint financing agreement;
- l) Institutionalizing strong financial management capabilities to improve project proposal preparation, disbursement and project implementation and compliance with accounting and reporting requirements;
- m) Encourage public-private-partnership and the active participation of the Gambia Chamber of Commerce in climate finance so as to have access to the Private Sector Facility of the GCF;
- n) Enhancing the capacity of the Budget Directorate of the Ministry of Finance and Economic Affairs, which is serving as the DNA of the GCF in The Gambia; and
- o) Establishing a regular platform for continued engagement and dialogue between the Government of The Gambia and both domestic and international representatives of the private sector on matters relating to the LECRDS.

5: MEANS OF IMPLEMENTATION

5.1: Finance

During the development of this INDC an economic assessment was conducted. The national climate change reports (NCSA, NOTCOMs, NAPA, NAMAs, etc) also contain some costs identified for implementation of identified activities.

Based on the economic assessment under this INDC, investments in renewable technologies (wind and solar) are highly beneficial for The Gambia. The upfront cost of renewables is identified as major challenge for the Gambia, due to inadequate financial resources. However, under a real discount rate of 10% per year, renewables emerge as the most profitable option, with an associated negative carbon price, ranging between -7 to -20 US\$/tCO_{2e}, depending on the scenarios (high or low demand). The economic analysis suggests that even higher shares of renewable electricity generation through solar PV and wind are feasible in The Gambia. Limitations to this are likely arising from the available finance for high up-front cost. Additional cost related to grid adjustments for this purpose is not considered in the analysis and would need to be assessed for higher shares of renewables. Methane capture in landfills also provides substantial mitigation potential at low cost. The associated cost is in the range of 0.34-0.36 US\$/tCO_{2e}.

Transitioning to a climate resilient economy will also come at a cost that will be beyond the reach of The Gambia, as a Least Developed Country (LDC). However, the cost of doing nothing now will be astronomical in the long term. Financing for the transitioning to low emissions and climate resilient economy in The Gambia is required for investment in all sectors but particularly in energy, agriculture and waste management sectors. In the energy sector investments will be directed to the transport sub-sector and in energy efficiency in buildings. Priority should be given to renewable sources such as solar and wind. Priority financing should be given to public sector infrastructure investments that are critical to the transition to the green economy. Households should also be a major target of financing, particularly to support energy efficient housing and appliances.

Developing countries have insisted in various fora on the principle of “adequate, new and additional” international financial resources for sustainable development, including environmental activities, to which the concept of predictability should be added. Presently, finance to support activities aimed at addressing climate change in developing countries is generated and delivered by an array of different agents, including the Green Climate Fund (GCF) and Global Environment Facility (for the UNFCCC), multilateral and bilateral development banks (or “finance institutions”), bilateral development cooperation agencies and the private sector. While much public focus to date has been on the contributions made through the

UNFCCC and the multilateral finance institutions, rather less attention has been paid to financial flows emanating from the bilateral finance institutions. However, these institutions have a long history in financing development activities and, more recently, have also generated sizeable flows in support of mitigation and adaptation. The Gambia intends to continue to use these international financial sources to access climate finance to support the implementation of her INDC and climate change in general.

Sub-regional development banks such as the African Development Bank (AfDB) and national development banks may serve as alternative climate change funding channels for long-term investment in The Gambia. These banks can play an increasingly important role in assisting The Gambia with a successful transition to low-emission climate-resilient development pathways. However, success on engaging national financial institutions in climate change has not met with the required success in The Gambia. The adoption of the Green Climate Fund and the establishment of the Africa Climate Change Fund offer new opportunities and initiatives to access financial support. The Directorate of Budget (DoB) of the Ministry of Finance has been nominated as the Designated National Authority of the GCF and will collaborate and coordinate with the Gambia Chamber of Commerce and Industry (GCCCI) to facilitate Gambia's access to the Private Sector Facility (PSF) of the GCF.

For sustainable funding of climate change in The Gambia, the Government proposes the establishment of a National Climate Change Fund to raise innovative sources of domestic climate finance. As with similar funds in some developing countries, the Fund will include existing national funds/financial programmes with similar objectives but disparate governance and accountability arrangements, and blend these resources with multiple complementary international and national resources for specific sectors/projects. The resources from the Fund can also be used to leverage international public finance and private finance. Actions to promote low-emission and climate-resilient development must be largely public policy-based and private-sector financed where international public finance is used catalytically alongside much larger capital flows. The strategy for continuous replenishment of the fund will be developed. Public Private Partnerships (PPP) will be facilitated to enable the contribution of the private sector in the financing climate change implementation.

For Long Term Finance and for consideration under the New Climate Regime to be adopted in Paris in December 2015, Gambia proposes adjustments in the climate finance architecture. In macroeconomic terms, priority should be given to financing programs that generate strong synergies with domestic efforts. Perhaps the most important are global financial efforts that facilitate the free or low cost access to technology: global financial technology funds that create knowledge that is made available as a public good, public sector purchase of relevant technology that is also made freely available, technical assistance in building technology capabilities, and human capital formation. A second area may be mechanisms that facilitate long-term domestic

financing in The Gambia, thus overcoming its short-term bias, for example using the capitalization of multilateral development banks (e.g., the AfDB) to expand considerably their bond issuance and lending in the domestic currencies of the developing countries, and to support activities that contribute to domestic financial development in these countries, particularly domestic development banks' capacity to extend the maturities of available domestic financing. An additional area that may become very attractive is the design of global disaster relief and disaster insurance facilities to manage climate disasters. Such facilities could include insurance premiums with a grant component that could vary according to the level of development of countries, such as The Gambia.

5.2: Technology Development and Transfer

Technology transfer is seen to play a critical role in the global response to the challenge of climate change. Technology transfer is a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, NGOs and research/education institutions. The broad and inclusive term “transfer” encompasses diffusion of technologies and technology cooperation across and within countries. It comprises the process of learning to understand, utilize and replicate the technology, including the capacity to choose and adapt to local conditions and integrate it with indigenous technologies (*Bert Metz et al, 2001*).

During the development of its Second National Communication to the UNFCCC, The Gambia identified the technical and technological requirements for the implementation of the Climate Change Convention and its Kyoto Protocol. The Gambia will also continue to assess and determine her technological requirements to implement the Convention and any future Climate Regime to be agreed in Paris.

Technologies identified and technology transfer requirements (*GoTG/SNS, 2013*) which will also be needed for the implementation of the INDC include:

1. Climate monitoring, forecasting and dissemination techniques and technologies;
2. Energy efficient technologies (*High efficiency lighting, Fluorescent lighting technology, Industrial Energy Efficiency Technologies, Fuel Efficiency Technologies*);
3. Solar Photovoltaic Technology;
4. Wind Energy (*wind mills*);
5. Biomass Energy Sources and Technologies (*Improved Cook Stoves*);
6. Bio-energy Technology for the Transport sector;
7. Waste Management Technologies (*Landfill methane capture and Composting technologies*);

8. Irrigation Techniques and Technologies (*Surface Irrigation Systems, Sprinkler irrigation systems, Drip Irrigation*);
9. Crop Types and Cultivars (*Deep-rooted, salt-tolerant tree/grass species, Flood tolerant crop species*);
10. Post harvest, food processing and preservation techniques and technologies (*Drying food preservation, Food preservation freezing, Vacuum packing Food preservation, Canning and bottling food preservation*);
11. Rain water harvesting and Water Treatment technologies;
12. Aquaculture; and
13. Coastal Protection Technologies (*Groynes, Sea walls, Offshore breakwaters and revetments*)

The Gambia would require international and south-south cooperation, collaboration and support for the development of its own technologies as well as for technology transfer and innovation to increase its mitigation and adaptive capacities.

5.3: Capacity Building

In the implementation of her INDC, The Gambia will require support and collaboration on capacity building and enhancement at the individual, institutional and systemic levels.

Capacity building on data identification, collection, processing, documentation and archiving has been highly achieved in the area of hydrology and meteorology but support would be needed to attain same or level of achievement in other climate related areas and sectors. Although there have been a lot of improvements in acquiring and installing state-of-the-art technologies and infrastructure for climate monitoring in The Gambia under the NAPA early warning projects, human capital to continue maintaining and monitoring climate and weather is inadequate. The National Meteorological and Hydrological Services (NMHS) will need to treble its number of professional staff, increase its middle cadre by 50% and redeploy most junior staff after training on new technologies, tools and procedures. Under the status quo, the immediate need is to recruit professionals and to train weather forecasters and hydrologists. The NMHS needs to develop and diligently pursue a fund-raising strategy that integrates cost-sharing, cost recovery, competitive bidding for international research grants and other innovative ideas as may be forthcoming over the years.

A science and policy-relevant framework for examining global change and local adaptation questions needs to be developed quite soon to make optimal use of favourable developments nationally and internationally. This strategic framework has to be sufficiently broad to include physical and social sciences and their interactions. Important considerations include data gap minimization, cost sharing and cost recovery, alliancing and partnerships and the use of

information technologies (IT) to boost research productivity. Tentatively, technical upgrading/technological transformation of data collection networks should be completed by 2018. By 2025, Gambian researchers and scientists should be in a position to conduct joint/collaborative research in a broad spectrum of thematic areas.

While the legal basis for education service delivery responds to upholding the right of everybody to quality basic education, as contained in the 1997 Constitution of The Gambia, there is empirical evidence to suggest that the provision of such education to any population lays a strong foundation for the sustainable development of any country (MoFEA/PAGE, 2011). It is for this reason that the Ministry of Basic and Secondary Education (MoBSE) continues to be preoccupied with the execution of its mandate to deliver quality education in the areas of early childhood development (ECD), basic education, adult and non-formal education and secondary education. Higher and tertiary education is also a key factor in human capital formation with the mandate of producing an informed, skilful and disciplined workforce. Capacity building needs to include the enhancement of curricula for lower and upper basic cycles and the tertiary level of education. As the National Education curricula are currently being reviewed, financial and technical support would be required to integrate climate change and other environmental issues into the curricula. This will be the starting point for the mainstreaming climate change into basic and higher education curricular and the development and institutionalization of specialized training programmes in higher education as is proposed in the PAGE (1012-2015).

National capacity to carry out earth system and global change research is quite low in The Gambia. The organizational history and status of the NMHS as a non-university institution with some research tasks has not contributed significantly to the generation of knowledge on global change, socio-environmental vulnerabilities, mitigation science, or adaptation practices. Most significantly, brain gain/drain ratios in the public sector have deteriorated since the mid-1980s. National research on climate change is largely driven by individual efforts and interests in the wide universe of issues related to global change. Strong collaborative ties forged with the Earth Institute, Columbia University, allow the UTG students and faculty access to programmatic support. Under the German Climate Change initiative, the Max Planck Research Institute and some German universities offer formal academic training, internships and e-learning opportunities to young Gambian scientists. The Government plans to embark on research and provision of higher education on climate change-related disciplines, such as adapted land use, and integrate climate change into the primary, secondary, tertiary and higher education curricula as the education sectors contribution to the proposed national climate change strategy of The Gambia (MoFEA/PAGE, 2011).

6: POLICIES, STRATEGIES, PROGRAMMES AND PROJECTS

The Government of The Gambia has in place legislative and policy instruments to address climate change and some of these instruments have been used to develop this INDC and will be used for its implementation.

The Government of The Gambia is committed to reducing poverty and improving the wellbeing of its population and this commitment is driven by the government's long-term strategy, **Vision 2020**. The goal of Vision 2020 is *“to transform The Gambia into a financial centre, a tourist paradise, a trading export-oriented agricultural and manufacturing nation, thriving on free market policies and a vibrant private sector, sustained by a well-educated, skilled, healthy, self-reliant and enterprising population, guaranteeing a well-balanced ecosystem and a descent standard of living for all, under a system of government based on the consent of the citizenry.”* Vision 2020 is being executed through a series of five-year development plans.

The Programme for Accelerated Growth and Employment (PAGE) is the current medium-term development strategy and investment programme for 2012 to 2015. The principal objective of the PAGE is to accelerate growth and employment in order to sustain economic growth and reinforce gains in welfare. PAGE takes the new domestic and international economic context into consideration and climate change is fully integrated into all the five pillars that encourage and promote sustainable development and low carbon pathway. The PAGE is currently being reviewed.

The National Environmental Management Act (NEMA) was enacted in 1994 and provides the legal framework for the control and management of the environment. NEMA makes provisions for the overall management of the coastal zone and all other wetlands. The priorities identified for a sound environmental management can be summarized as: (i) improvement and strengthening the institutional framework for environmental management; (ii) mainstreaming environment issues in policy and planning processes; (iii) strengthening environmental regulatory framework and enforcing the regulatory codes, and environmental regulations fully; (iv) Ensuring the functioning of institutional and legal frameworks for sustainable management and protection of the coastal zone and its resources; (v) strengthening environmental advocacy and sensitisation for sustainable development; (vi) ensuring the participation of the private sector, CSO, Non-Governmental Organization, and youth and women's groups in sustainable natural resource consumption; (vii) supporting decentralisation and Local Government Reform for community based natural resource management and sustainable development planning; and (viii) improving environmental quality monitoring and enforcement and solid waste management.

The Energy Sector Instruments relevant to the preparation/implementation of this INDC

There are a number of existing and planned policies and strategies in the energy sector of The Gambia geared toward promoting low carbon development and reducing carbon emissions for sustainable social and economic development. Climate change mitigation policies could discourage unsustainable use of fossil fuels while promoting renewable energy and energy efficiency in electricity generation, transmission and use. However, the success of energy policies depends on institutional capacity building, the removal of financial barriers, and the development of strong legal framework with sufficient regulatory stability. International and regional cooperation, collaboration and support are required.

Below is an overview of the policies and measures for mitigating climate change in the energy sector:

- (a) **National Energy Policy, Strategy and Action Plan (2014 – 2018)** is popularizing the use of RE technologies, facilitate donor intervention in the provision of grants, interest-free loans as well as fiscal incentives for the acquisition of renewable energy devices, implement RE law recommendations for feed-in-tariffs to attract investment in the RE power plants, and publish FiT to give confidence to investors.
- (b) **National Energy Efficiency Action Plan (NEEAP) of The Gambia (2015-2020/2030)** provides scenarios for the contribution of energy efficiency in the electricity and cooking sectors were developed. The analysis of the simulation results provided sectorial energy efficiency targets in 2020 and 2030 which are adopted as what The Gambia intends to achieve by 2020 and 2030 as contribution to the attainment of the EEP's targets. The sectoral categories include efficient lighting, high performance distribution of electricity, energy efficiency standards and labelling, buildings and Industry. The effective implementation of the energy efficiency targets and trajectories will depend on the appropriateness of the measures and activities it adopts to create an enabling environment for actors. Some of the key elements of such an enabling environment include a well-conceived policy regime; a vibrant institutional, legal and regulatory framework; mechanisms for incentive planning of rules and behaviour; responsive organizational arrangements; and a well-designed regime of inducements and deterrents for individual actions. Thus, measures and activities are proposed in (a) efficient lighting; (b) standards and labeling; (c) energy efficient building; (d) electricity distribution; (e) cooking initiatives; (f) energy efficiency in the industrial sector; (g) energy efficiency in the transport sector; (h) other sectors (agriculture fisheries, etc.); and (i) cross-cutting measures. The national authority for the follow-up of the National Energy Efficiency Action Plan is the Ministry of Energy. A monitoring system, including indicators for individual measures and instruments, will be developed with the support of ECREEE, in order to follow-up the implementation of the National Energy Efficiency Action Plan (NEEAP).

- (c) **National Investment Program on Access to Energy in The Gambia (2013 – 2020)** will increase access to energy services for rural, urban and peri-urban populations by 2020.
- (d) **Renewable Energy Act, 2013** is designed to promote the use of RES in order to achieve greater energy self-reliance which will thus reduce the nation's exposure to fossil fuels, harmful emissions and the demand burden in regards to the supply of electricity; establish a Renewable Energy Fund; encourage investment into the RE sector; and ensure appropriate training and certification of installers of RE equipment and provision of guarantees to clients
- (e) **Sustainable Energy for All (SE4ALL) Action Agenda and Investment Prospectus (2015 – 2030)** is the country's plan of action to achieve the set of SE4ALL goals by 2030. SE4ALL is a global initiative led by the Secretary-General of the United Nations, Ban Ki-moon to achieve universal energy access, improve energy efficiency, and increase the use of renewable energy. It was launched to coincide with the designation of 2012 as the *International Year of Sustainable Energy for All* by the UN General Assembly in December 2010. The Investment Prospectus is designed to operationalize the SE4ALL Action Agenda for The Gambia by identifying and developing a set of implementable programs and projects, including their investment requirements. The investment prospectus features a number of projects that promote renewable energy and energy efficiency. These projects, if implemented, will contribute to climate change mitigation efforts.

The National Disaster Management Policy brought disaster management issues including climate change and its impacts into the limelight and has introduced adaptive mechanisms at the community level. The Policy advocates for efficient response mechanisms to disaster management and developing an institutional framework and building capacities at the national, regional and local levels to respond to disasters in a timely fashion. The overall objective of the policy is to build safe and resilient communities by enhancing the use of and access to knowledge and information in disaster prevention and management at all levels of society. Climate change adaptation is fully integrated into the Policy.

The Decentralization Act and Policy places emphasis on localization of development activities including the strengthening of human and institutional capacities on a country-wide basis. In the area of climate change, integration of climate change responses into the Decentralization Policy and the District and Village Development Plans will be initiated in 2016. The Department of Water Resources (the UNFCCC Focal Secretariat) is working with the Municipal and Regional Administrative structures such as the Office of the Mayors, Office of the Regional Governors, the Regional Technical Advisory Committee (TAC) and the Regional Multidisciplinary Facilitation Teams (MDFTs) to enhance access to climate and climate change information by the local communities who are the most vulnerable to climate variability and change.

The Agriculture and Natural Resources (ANR) Policy (2009 – 2015) (GOTG/ANR, 2009) is the medium term policy for the Agriculture (Crops, Livestock, Horticulture, etc.) and Natural Resources (Environment, Fisheries, Forestry, Parks and Wildlife and Water Resources) sectors. It combines policy, institutional, infrastructure and technology related measures to address the multiplicity of supply-side constraints of Gambian agriculture. The overall objective of the ANR is to increase the agriculture sector's contribution to the national economy by increasing productivity through commercialization and greater private sector participation predicated on a sound macroeconomic framework aimed at enhanced growth and employment creation. In 2014, climate change was integrated into the ANR Policy and efforts are underway to revise the Policy.

Other relevant policies include the **Fisheries (2012 – 2015), Forestry (2009 – 2019), Water Resources (2009 – 2019) and Biodiversity and Wildlife Management policies**. Complementary policies also exist for nutrition (2010 – 2020) and gender (2010 – 2020). The objective of the Forestry Policy is to maintain 30 percent of the total land area of The Gambia under forest cover and thus increase the carbon sink of the country. The Fisheries Policy emphasis the maximization of yields through fish farming and protecting the fish landing sites and facilities from flooding, identified as one of the adaptation activities to address the adverse impacts of climate change on the sector and the national economy.

In addition to the national and sectorial policies discussed in the preceding paragraphs, there are a number of complementary plans, programmes and projects, which are closely linked to development and implementation of climate change activities including this INDC. These include the **Gambia National Agricultural Investment Plan** (GNAIP, 2011 – 2015, Ref: GOTG/GNAIP, 2010), the West Africa Agricultural Productivity Programme (WAAPP), the Global Agricultural Food Security Programme (GAFSP, 2012 – 2016) and the United Nations Development Assistance Framework (UNDAF, 2012 – 2016). The GNAIP is aligned fully with the national goals of Vision 2020, and aims to support the realization of main national strategic programmes, including the PAGE (2012-2015) and the Agriculture and Natural Resources (ANR) Sector Policy (2010).

Other strategies and programmes specific to climate change include the NAPA (GOTG/NCC, 2007) the Climate Change Priority Action Plan of the PAGE (GOTG/PAGE, 2011), the National NAMA (2011) which includes the proposed development of a Low Emissions Climate Resilient Development Strategy (LECRDS), the Agriculture NAMA (2013) and the Energy NAMA.

Climate change must be integrated into these policies, strategies, plans and programmes for the effective and sustainable implementation of the climate change convention and any future regimes. This will serve to mainstream climate change into the development frameworks of The Gambia.

7: FOLLOW UP

The Government and people of the Republic of The Gambia request that this submission is published on the UNFCCC webpage and that this INDC is included in the synthesis report to be prepared by the Secretariat. The Gambia and its collaborators are willing and available to provide further information to enhance clarity. It is our ardent belief that other countries with similar and more advance national circumstances of The Gambia can and should submit their INDC well before Paris.

8: REFERENCES

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GEORGIA'S INTENDED NATIONALLY DETERMINED CONTRIBUTION SUBMISSION TO THE UNFCCC

Georgia is pleased to communicate its intended nationally determined contribution (INDC), elaborated by the Ministry of Environment and Natural Resources Protection of Georgia in close cooperation with the key ministries and other relevant stakeholders involved in the consultations process.

Introduction

Georgia is fully committed to the UNFCCC negotiation process with a view to adopting a global legally binding agreement at the Paris Conference in December 2015 applicable to all Parties in line with the below 2°C objective.

The dissolution of Soviet Union and the collapse of centrally planned economy in early 90s caused significant reduction in national greenhouse gases (GHG) emissions (lowest value 8,799 KtCO₂eq in 1995). According to the Third National Communication of Georgia to the UNFCCC, GHG emissions from Georgia in 2011 constituted 16,036 KtCO₂eq which is 34% of 1990 emissions level (47,975 KtCO₂eq).

Economic growth will be accompanied by increase in GHG emissions (if no efforts are made to reduce GHG emissions associated). Therefore, it is important to undertake efforts to substantially limit this increase by boosting investments in low carbon technologies throughout the country.

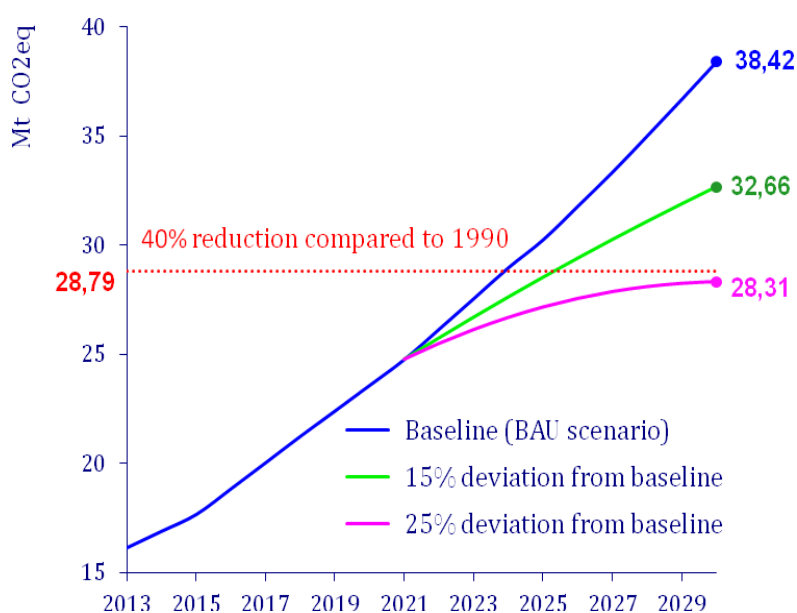
In 2010 Georgia acceded to the Copenhagen Accord and declared that *“Georgia will take steps to achieve a measurable, reportable and verifiable deviation from the baseline scenario (below “business as usual” levels) supported and enabled by finance, technology and capacity-building”*.

The Government of Georgia acknowledges and appreciates the role of international support in Georgia’s efforts to mitigate climate change, namely the support of the US Government in the development of a Low Emission Development Strategy (LEDS) and the support of the European Union and the Government of Germany in preparation of the INDC. The preparation of LEDS was launched in 2013 and is expected to be finalized in 2016. Georgia’s INDC is largely based on currently available results achieved during the LEDS preparation process. The final LEDS and the mitigation actions specified therein will become key instrument in achieving Georgia’s GHG emission reduction target.

Intended nationally determined contribution (INDC) of Georgia

The Lima Conference invited all Parties “to communicate their intended nationally determined contributions well in advance of the twenty-first session of the Conference of the Parties in a manner that facilitates the clarity, transparency and understanding of the intended nationally determined contributions.”

Georgia plans to unconditionally reduce its GHG emissions by 15% below the Business as usual scenario (BAU) for the year 2030. This is equal to reduction in emission intensity per unit of GDP by approximately 34% from 2013 to 2030. The 15% reduction target will be increased up to 25% in a conditional manner, subject to a global agreement addressing the importance of technical cooperation, access to low-cost financial resources and technology transfer. This is equal to reduction of emission intensity per unit of GDP by approximately 43% from 2013 to 2030. The 25% reduction below BAU scenario would also ensure that Georgian GHG emissions by 2030 will stay by 40% below the 1990 levels.



In line with the *Lima Call for Climate Action*, in particular its paragraph 13, the following quantifiable information is hereby submitted:

Intended Nationally Determined Contribution of Georgia	
Party	Georgia
Type	Deviation from baseline, business as usual scenario
Coverage	All sectors excluding LULUCF
Sectors	<ul style="list-style-type: none"> • Energy • Industrial processes • Agriculture • Waste <p>Information on GHG emissions reduction targets for the forestry sector of Georgia is given in Annex 1.</p>
Scope	All greenhouse gases not controlled by the Montreal Protocol: <ul style="list-style-type: none"> • Carbon Dioxide (CO₂) • Methane (CH₄)

	<ul style="list-style-type: none"> • Nitrous Oxide (N₂O) • Hydrofluorocarbons (HFCs) • Perfluorocarbons (PFCs) • Sulphur hexafluoride (SF₆)
Base Year	2013
Period	1 January 2021- 31 December 2030
Reduction level	<p>Georgia plans to unconditionally reduce its GHG emissions by 15% below the Business as usual scenario (BAU) for the year 2030. This is equal to reduction in emission intensity per unit of GDP by approximately 34% from 2013 to 2030. The 15% reduction target will be increased up to 25% in a conditional manner, subject to a global agreement addressing the importance of technical cooperation, access to low-cost financial resources and technology transfer. This is equal to reduction of emission intensity per unit of GDP by approximately 43% from 2013 to 2030. The 25% reduction below BAU scenario would also ensure that Georgian GHG emissions by 2030 will stay by 40% below the 1990 levels.</p>
Pre-2020 mitigation actions	<p>Georgia plans to finalize its Low Emission Development Strategy in 2016, which will detail pre-2020 mitigation actions. In addition, Government of Georgia is in process of drafting its first National Energy Efficiency Action Plan (NEEAP) that will be finalized by the end of spring 2016. The NEEAP will document the plans for implementation of energy efficiency measures which have significant mitigation potential for the period before 2020 and beyond.</p> <p>It is envisaged that the most intensive pre-2020 mitigation action in Georgia should be the voluntary reduction of GHG emissions committed by thirteen self-governing cities and municipalities joining the EU initiative “Covenant of Mayors” (CoM). Further facilitation of this initiative will significantly contribute to post -2020 implementation processes.</p> <p>Three Nationally Appropriate Mitigation Actions (NAMA) are under preparation and, in case of international support, are expected to be implemented prior to 2020. They are expected to be a basis for subsequent larger-scale mitigation actions for the post-2020 period. These NAMA activities include:</p> <ul style="list-style-type: none"> • Gender-sensitive NAMA for sustainable energy in rural areas; • NAMA for Low Carbon Buildings in Georgia; • Vertically Integrated NAMA (V-NAMA) for the Urban Transport Sector. <p>All above mentioned pre-2020 mitigation actions have been taken into account while calculating the BAU scenario.</p>
% of Emissions Covered	100%
Planning Process	<p>Georgia will support its mitigation target with comprehensive national climate change policy. The first step will be the finalization of the LEDS. In addition, Georgia plans to develop an action plan “climate 2021-2030” (intended to be finalized in 2018) which will define the legal instruments, activities, methods and other relevant issues.</p>

	The legislative proposals, national programs and domestic legally-binding acts to implement 2030 climate target will be influenced by Georgia-EU association process and the planned membership in the European Energy Community.
Fair and ambitious	Georgia's INDC is fair and ambitious because despite the fact that national GHG emissions of Georgia represents only approximately 0.03% of global emissions, Georgia is committed to contribute in joint efforts to combat climate change by transforming its economy to low carbon and climate resilient pathway The INDC is Georgia's first quantified international commitment to mitigate climate change. The main share of mitigation actions will be implemented with national resources, in an unconditional manner. Only conditional measures will require international support.
Metric Applied	GWP 100y values published in IPCC SAR (CO ₂ e): <ul style="list-style-type: none"> • CO₂=1 • CH₄ = 21 • N₂O = 310
Methodologies for Estimating Emissions	<ul style="list-style-type: none"> • Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories. • 2006 IPCC Guidelines for National Greenhouse Gas Inventories • Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories

Adaptation

Climate change and its adverse impacts on ecosystems and economy pose severe threats to Georgia's sustainable development. Unique geographical location, complex dissected relief, land cover diversity and specific climate, containing almost every type of climatic zones, set conditions for wide variety of negative consequences of climate change in Georgia: (a) due to sea level rise and other factors Black Sea has affected certain areas of land, destroyed and/or damaged houses and infrastructure along the coast; (b) in highlands, growing frequency and intensity of floods, flashfloods, landslides and mudflows have caused a huge amount of damage in the economy; (c) due to decreased rainfall and enhanced evaporation semi-arid regions in Eastern Georgia are under the threat of desertification; (d) more frequent and intensive heat waves have affected human health; (e) rising temperatures, changes in precipitation patterns, reduced water availability, forest fires, pests and diseases have worsen the growth and productivity of forests. (f) Rising temperatures, increased winds and reduced water availability have significantly declined agricultural productivity.

In case of a 2°C or higher increase in global warming, effects will become more severe in the future. This will create an extra burden on the development of society. Accordingly, adaptation to the adverse impacts of climate change is one of the main priorities for the Government of Georgia. The National Adaptation Plan will be prepared in order to further advance the implementation of adaptation actions. The main objective of the Government of Georgia is to improve country's preparedness and adaptive capacity by developing

climate resilient practices that reduce vulnerability of highly exposed communities. In this regard, Georgia takes steps to integrate climate risk and resilience into core development planning and implementation.

Georgia's agricultural sector plays a key role in the country's economy. Georgian farmers are going to fulfill a principal role in providing one of the fundamental needs of society: a safe, secure, and affordable food supply. This underlines the importance of the relationship between climate change impacts on agriculture and food security. During last decades negative consequences of climate change have drastically reduced agricultural productivity. For example, severe drought in 2000 has reduced the production of cereals close to zero; due to the prolonged drought almost 400,000 hectares of agricultural lands have been damaged. Within the last decade the occurrence of droughts in Eastern Georgia increased, the severe droughts have been observed every year accompanied with high temperatures (40-42^o) doubling the frequency of the occurrence of the intense droughts in the region.

For the adaptation of agricultural sector to the expected climate change, wide range of measures is planned. Those include, but are not limited to the following: (a) research and development of emergency response plans for agriculture dealing with droughts, floods, etc; (b) Introduction of innovative irrigation management and water application techniques; (c) implementation of various site specific anti-erosion measures; (d) establishment of information centers for farmers that provides guidance on adaptive management of agriculture; etc.

A complex mountainous topography makes the country more prone to the climate extremes and related events. Georgia is vulnerable to natural hazards including floods, flash floods, droughts, landslides, avalanches, and mud flows. Many of these extreme events have been recorded in the last two-three decades, the most recent one happening on the 13th of June 2015 in Tbilisi. The flash-flood was distinctive not only due to the high casualty (19 people dead and huge economic loss (around 100 million USD) but reconnecting to the fact that it was characterized by 9 different types of hydro-meteorological and geological extremes, occurring simultaneously within a very limited area. These weather extremes additionally result in changing of the hydrology of rivers, posing a serious impact on continuous water availability for drinking, irrigation and energy. Establishment of Early warning systems for climate related extreme events is considered as priority measure by the Government of Georgia.

Sea level rise impacts are projected to induce multiple negative consequences in coastal zone of Georgia. It is imperative to assess and implement adaptation measures in order to minimize economic losses. Combination of various coastal zone protection technologies are recommended by the second "Technology Needs Assessment" report of Georgia to prevent the significant damage caused by the Black Sea level rise. According to the National communications of Georgia to the UNFCCC costs of the coastline adaptation program is estimated about 600 million USD. In absence of adaptation measures the estimated losses only in the tourism sector will reach about 2 billion USD by 2030. Due to very high social costs involved, priority will be given to the integrated coastal planning and management instruments, rather than investments in coastal erosion abatement only.

Without international support Georgia is unable to cope with adverse effects of climate change. “Lima Call for Climate Action” (Decision 1/CP.20) “*Urges developed country Parties to provide and mobilize enhanced financial support to developing country Parties for ambitious mitigation and adaptation actions*”.

According to the expert judgment estimated economic losses without adaptation measures during 2021-2030 will be about 10-12 billion USD, while adaptation measures will cost within 1.5-2 billion USD. Accessing finance that allows Georgia to adapt to the impacts of climate change is crucial. To estimate required financial support the following pre-2020 activities are planned: (a) prioritize selected adaptation policies and measures based on national circumstances and identify associated financial needs; (b) evaluate domestic sources of finances; and (c) determine need and sources for external financial support.

Georgia needs international support for the development and transfer of technologies to increase its adaptive capacity. In this regard technologies for the protection of coastal infrastructure; technologies for sustainable water management; sustainable agricultural technologies; and technologies for sustainable forest management are prioritized.

The implementation of adaptation actions for the period 2021 – 2030 requires the continuous development and strengthening of Georgia’s capacities, in particular: (a) national capacity to develop adaptation strategies; (b) policy makers capacity for climate change adaptation planning; (c) capacity of communities to reduce their vulnerability to adverse impacts of future climate hazards; (d) capacity of national health system institutions, to respond to and manage long-term climate change-sensitive health risks.

It is fundamental to incorporate a gender- and human rights-sensitive approach in adaptation planning capacity building, prioritizing the most vulnerable sectors and regions in order to reduce social inequality and the gap between women and men rights.

Forests

Climate change adverse impacts pose severe threats to Georgia's forests. Rising temperatures, changes in precipitation patterns, reduced water availability, increased frequency of forest fires, as well as pests and disease outbreaks have reduced carbon sequestration ability of forests.

There is no reliable inventory data on most forest resources of Georgia. The last nationwide forest inventory was conducted in early 1990s. According to the expert judgment, on 600,000 ha, which are declared for timber production forests (about 22% of Georgia's forest area), timber and fuel-wood extraction has significantly exceeded the respective annual allowable cut over the last two decades. In 2014, the forest resources assessment of the pilot area - Borjomi-Bakuriani Forest District shows the reduction in forest biomass by almost 20% over the past 15 years. However, it is premature to draw conclusions on the state of Georgia's forests based on the results obtained for one forest district covering only 45,000 hectares.

The Georgian Government prioritizes three options for climate change mitigation activities in forestry sector: (a) establish Sustainable Forest Management (SFM) practices; (b) conduct afforestation/reforestation and assist natural regeneration; and (c) expand the protected area.

Unconditional commitment

Georgia is committed to:

- Strongly support CO₂ reduction in one pilot area, the Borjomi-Bakuriani Forest district (currently the only forest district where carbon emissions have been quantified) by at least 70% between 2020 and 2030, by strengthening law enforcement and introducing SFM practices. It is estimated that this measure will lead to an overall emission reduction of at least 1 million tonnes of CO₂ over a period of 10 years in this district covering 45,000 hectares;
- Implement afforestation/reforestation activities on already identified 1,500 ha of degraded lands by 2030;
- Assist natural regeneration of forests through different silvicultural methods on 7,500 ha by 2030 in order to restore natural forest cover.

Conditional commitment

- In case of external financial and technical support, the country commits itself to afforest/reforest up to a total of 35,000 hectares, as well as supporting relevant activities to assist natural regeneration in identified areas needing afforestation / reforestation until 2030;
- If Georgia receives substantial financial and technical support for the development of forest inventories and remote sensing, as well as the development of internationally recognized practices for SFM and carbon monitoring for the identified forest districts

(covering up to 250,000 ha of forest lands) the country commits itself to support the sustainable management of forests with estimating measures leading to an overall carbon sequestration up to 6 million tons of CO₂ on these lands over a period 2020-2030. These forest lands include the forest district of Akhmeta (covering up to 70,000 ha) where the first set of locality/site-specific criteria and indicators (C&I) for SFM will be selected/tested and implemented. The objective is to gain relevant expertise for further development of the C&I for SFM in the rest of identified forest lands to achieve the nation-wide development of SFM practices, thereby support the carbon sequestration;

- With financial support from international sources to set up an adequate infrastructure and assure effective planning for management of the additional protected areas during 2020-2030, country commits itself to expand the protected area from 0.52 million ha to 1.3 million ha (about 20% of Georgia's territory) comprising at least 1 million ha of forests.



Republic of Ghana

GH – INDC

Ghana's intended nationally determined contribution (INDC) and accompanying explanatory note

September, 2015

1. Introduction

In preparing and submitting its INDC, Ghana is mindful of its international obligations as a Party to the UNFCCC while simultaneously pursuing a national development agenda that seeks to achieve the long-standing objective of becoming a fully-fledged middle-income economy. Ghana's response to the threats posed to this objective by the impacts of climate change has been to pursue coordinated domestic policy actions that in effect seek to develop a policy framework that integrates adaptation, mitigation and other climate related policies within broader development policies and planning in order to safeguard developmental gains from the impacts of climate change and build a climate resilient economy.

At the multilateral level, Ghana reaffirms its resolve to support global efforts to define a common future that seeks to safeguard the collective interest of all nations by supporting a global agreement that is fair, ambitious and balanced, respects the right of nations to pursue sustainable development, and above all gives equal opportunities to all nations and their citizens, to pursue and realise their future aspirations.

At the milestone 17th Session of the Conference of the Parties (COP) held in Durban, South Africa in December 2011, the Parties decided to “develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties” for adoption at the twenty-first session of the COP and for it to come into effect and be implemented from 2020. Parties agreed that their work will address inter alia, mitigation, adaptation, finance, technology development and transfer, transparency of action and support, and capacity building.

At COP 19 in Warsaw, Parties agreed to advance their work by focusing on the elements of the new agreement. The Warsaw Conference was also very significant in that for the first time in Decision 1/CP 19, Parties were invited to “initiate or intensify domestic preparations for their intended nationally determined contributions (INDCs), without prejudice to the legal nature of the contributions”. The decision also requested the Ad Hoc Working Group on the Durban Platform for Enhanced Action to identify by the 20th session of the COP, the information that Parties will provide when putting forward their contributions, without prejudice to the legal nature of the contributions. Ghana holds the view that the INDCs should cover mitigation, adaptation, finance technology, capacity building and transparency and agrees with the common position of Africa that:

- The INDCs should conform fully with the Convention;
- Respect its differentiation between developed and developing countries;
- Build on established Convention obligations, particularly relating to means of implementation; and
- Enable developing countries, particularly, African countries, to fully participate in the global effort to achieve the Convention's objective, with regards to both mitigation and adaptation, in line with the Convention's provisions.

Ghana's INDC builds on other national documents prepared and submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in fulfilment of its obligations under the Convention. These include the National Communications, Biennial Update Reports, Nationally Appropriate Mitigation Actions (NAMAs) and Technology Needs Assessment (TNAs). Ghana sees finance as an essential part of the whole INDC process. The scope of finance from the developed countries must address mitigation, adaptation, and technology transfer and development in developing countries. It should not be solely focused on mitigation.

Ghana as a Party to the UNFCCC and also to the Kyoto Protocol is committed to meeting its commitments in order to contribute its fair share to the attainment of the objective of the Convention. In view of this and in accordance with Decisions 1/CP.19 and 1/CP.20, the Republic of Ghana is pleased to communicate its INDC and associated explanatory note to facilitate the clarity, transparency, and understanding of our contribution.

2. Ghana's contributions

Based on its national circumstances, Ghana has put forward mitigation and adaptation actions in its INDC. The inclusion of both mitigation and adaptation in the INDC resonate with the medium-term development agenda (Ghana Shared Growth Development Agenda II - GSGDA 2), the anticipated 40-year socio-economic transformational plan and the universal sustainable development goals. In all, 20 mitigation and 11 adaptation programme of actions¹ in 7 priority economic sectors are being proposed for implementation in the 10-year period (2020-2030). The implementation of the actions are expected to help attain low carbon climate resilience through effective adaptation and greenhouse gas (GHG) emission reduction in the following priority sectors:

- Sustainable land use including food security
- Climate proof infrastructure
- Equitable social development
- Sustainable mass transportation
- Sustainable energy security
- Sustainable forest management; and
- Alternative urban waste management.

These 31 programme of actions will drive the strategic focus of a “10-year post-2020 enhanced climate action plan” that would be developed after Paris. In the 10-year period, Ghana needs USD 22.6 billion in investments from domestic and international public and private sources to finance these actions. USD 6.3 billion is expected to be mobilized from domestic sources whereas the USD 16.3 billion will come from international support.

¹ “Programme of actions” are specific actions Ghana will implement in order to achieve the broad objectives set out in the “Policy actions”

2.1 Mitigation goal

Ghana's emission reduction goal is to unconditionally lower its GHG emissions by 15 percent relative to a business-as-usual (BAU) scenario emission of 73.95MtCO_{2e}² by 2030.

An additional 30 percent emission reduction is attainable on condition that external support is made available to Ghana to cover the full cost of implementing the mitigation action (finance, technology transfer, capacity building). With this external support, a total emission reduction of 45% below the BAU emission levels can be achieved by 2030 (see figure 1).

The following INDC policy actions³ will be implemented to achieve the mitigation goals

Sectors	INDC Policy Actions	No. of Programme of Actions
Energy	Scale up renewable energy penetration by 10% by 2030	5
	Promote clean rural households lighting	1
	Expand the adoption of market-based cleaner cooking solutions	2
	Double energy efficiency improvement to 20% in power plants	1
Transport	Scale up sustainable mass transportation	1
AFOLU	Promote Sustainable utilization of forest resources through REDD+	5
Waste	Adopt alternative urban solid waste management	3
Industry	Double energy efficiency improvement to 20% in industrial facilities	1
	Green Cooling Africa Initiative	1

2.1.1 Outlook of emissions trajectory up to 2030

Without prejudice to the outcome of our emission reduction goal, the outlook of Ghana's emission trajectory for 2020 to 2030 is projected as follows:

- Under BAU emissions are expected to rise from 19.53 MtCO_{2e} in 2010 to 37.81 MtCO_{2e} in 2020, to 53.5 MtCO_{2e} in 2025 and 73.95MtCO_{2e} in 2030.
- Under the unconditional emission reduction goal, emissions are expected to decrease by 12 percent and 15 percent relative to the BAU emission levels in 2025 and 2030 respectively.

² Million tonnes carbon dioxide equivalent

³ Refer to the Annex 1 for the detail description on mitigation Policy actions and the Programme of actions that come with it.

- A similar emission trajectory is anticipated under the “conditional emission reduction goal” except that the degree of deviation relative to the BAU emission is higher compared to the projections under the unconditional goal. Under the “conditional emission reduction goal”, emission are expected to decrease by 27 percent and 45 percent relative to the BAU emissions in 2025 and 2030 respectively.

2.1.2 Explanatory note on assumptions and methodology

Base year	2010
Mid-year	2025
Target year	2030
Timeframe	Time of implementation of emission reduction programmes is up to 2030 subject to review in 2025.
Type of “Target”	Emission reductions from projected emissions resulting from the deviation of BAU emissions for the year 2030.
Scale	Economy-wide
Basket of gases	Carbon dioxide (CO ₂), Methane (CH ₄), and Nitrous Oxide (N ₂ O). Abatement of fluorinated-gases (HFC-22 and HFC-410) from stationery air-conditioners is included.
% of emissions covered	100% of total national GHG emissions.
Sectors covered	Priority sectors: energy including transport, industrial process and product use, AFOLU and waste.
Baseline scenario	Business as usual emissions ⁴ estimated to be 73.95MtCO ₂ e by 2030 starting from baseline emission of 19.53MtCO ₂ e in 2010. This excludes any future developments in the extractive industry. The baseline scenario includes Ghana’s intentions to explore opportunities using clean coal technology in public electricity generation mix to meet its energy security objectives.
Emission reduction scenario	GHG emission projections for 2030 starting in 2010. The unconditional emission reduction goal is based on the implementation of 2 transformational mitigation actions ⁵ . Whereas, the conditional emission reduction goal assumes the implementation of 18 transformational mitigation actions (table 1) over the 10-year (2020-2030) period.
Global Warming Potential (GWP)	The carbon dioxide equivalent (CO ₂ e) was calculated using the 100-year global warming potentials (CO ₂ = 1, CH ₄ = 21, N ₂ O=310, HFC-22 =1,780 and HFC-410 =2,060) in accordance with the IPCC 2 nd Assessment Report. The GWPs were used on the national GHG inventory to establish historical emission trend from 1990 to 2012.

⁴ BAU is subject to revision before 2020.

⁵ Ghana is mobilizing \$7.2billion commercial facility to develop Sankofa-Gye Nyame transformational gas project in partnership Vitol and ENI. Ghana takes note of this action as part of its unconditional contribution. Detail estimates of both GHG impacts and co-benefits will be provided before 2020.

<p>Contribution of International Market based mechanisms</p>	<p>Ghana intends to generate compliance grade emission reductions units from actions in the waste and energy sectors and REDD+. Access to market-based mechanisms where these emission reduction units would be fungible and tradable forms an important component of the strategy to mobilize long-term support for the INDCs. These market-based mechanisms must have robust accounting rules and standards, avoid double-counting and ensure environmental integrity.</p>
<p>Methodology for estimating emission</p>	<p>Historical emission trends - Historical GHG emissions from 1990 to 2012 were estimated using the 2006 IPCC guidelines. The 2010 baseline GHG emission was derived from the 22-year time series.</p> <p>Energy sector projections - The BAU and emission reduction scenarios for the energy sector were developed for the sectors using the "Long-range Energy Alternatives Planning System" (LEAP) software. The analysis was done using data from the strategic national energy planning exercise by the Energy Commission and from the Ghana Standard Living Survey by Ghana Statistics Service. Data on sectoral activities, economic demographic and technology penetration were derived from the sources named above.</p> <p>Industrial sector projections - A comprehensive modeling approach was used. The underlying assumptions of BAU and emission scenario were based on the following predictors: population, GDP, urbanization, electrification rate, penetration rate of domestic refrigeration and annual stocks of air-conditioners.</p> <p>Waste sector projections - BAU and emission reduction scenarios for the waste sector were generated using IPCC waste model. Projection was limited to methane gas management in engineered landfills. Data on variation in urban population, efficiency of urban waste collection and landfill gas recovery were based on national statistics.</p> <p>AFOLU sector projections - BAU and emission scenarios were estimated based on IPCC AFOLU accounting rules using COMAP⁶ tool and the Forest Carbon Partnership Facility (FCPF) methodological framework.</p>

⁶ Comprehensive mitigation assessment process, 1999. Ernest Orlando Lawrence Berkeley National Laboratory, United States of America.

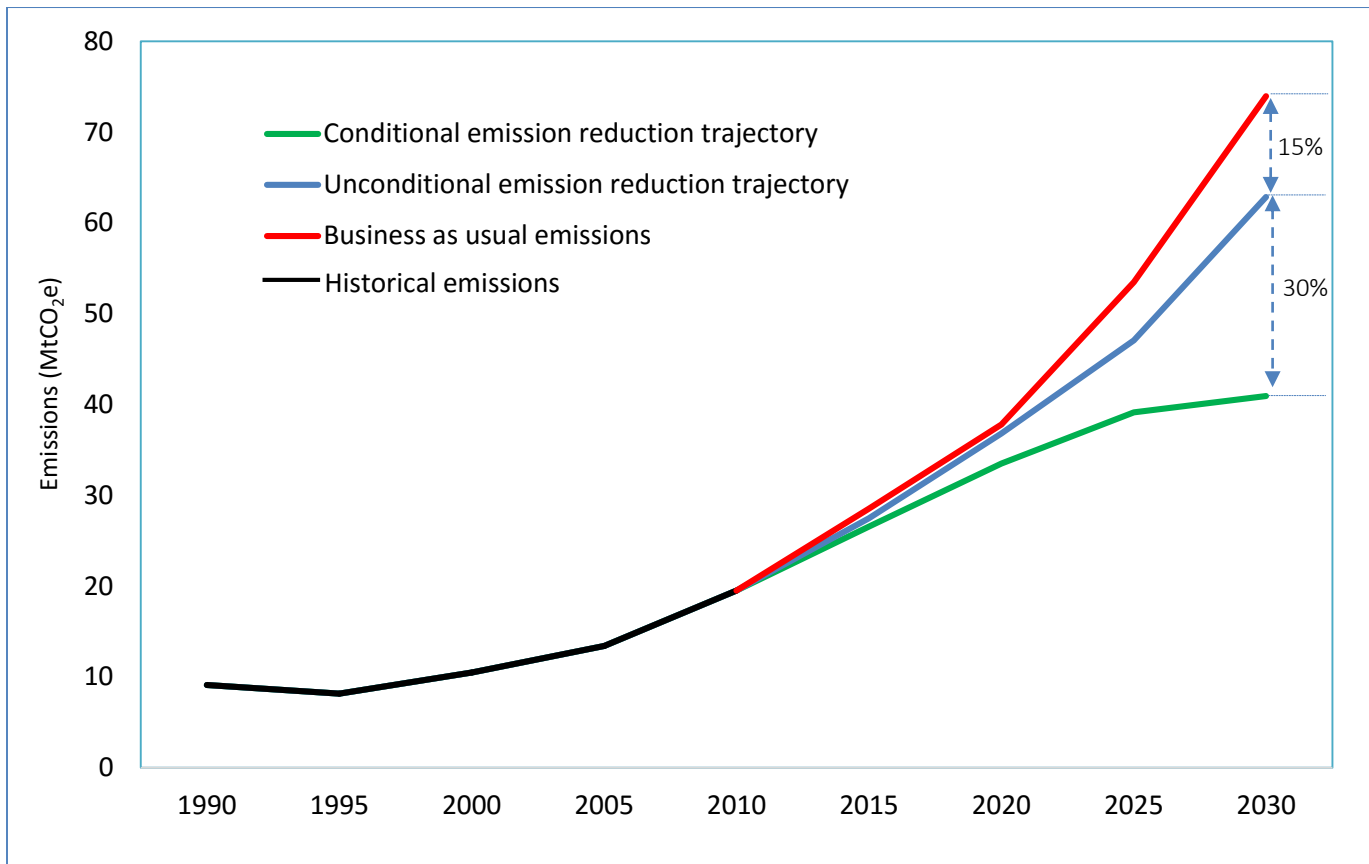


Figure 1: Emission reduction trajectory

2.2 Adaptation Goal

The long-term goal of Ghana’s adaptation is to increase climate resilience and decrease vulnerability for enhanced sustainable development. Adaptation under Ghana’s INDC is informed by:

- good governance and inter-sectoral coordination,
- capacity-building, the role of science, technology and innovation,
- adequate finance from both domestic sources and international cooperation,
- promoting outreach by informing, communicating and educating the citizenry; and
- adhering to accountable monitoring and reporting.

The following priority adaptation policy actions will be implemented in order to achieve Ghana’s INDC adaptation goal.

Sector	Strategic Area	INDC Policy Actions	No of Programme of Actions
Agriculture and food security	Sustainable land use	Agriculture resilience building in climate vulnerable landscapes	3
Sustainable forest resource management		Value addition-based utilization of forest resources	2
Resilient Infrastructure in built environment	Climate resilient strategic infrastructure	City-wide resilient infrastructure planning	1
		Early warning and disaster prevention	1
Climate change and health	Equitable social development	Managing climate-induced health risk	2
Water resources		Integrated water resources management	1
Gender and the vulnerable		Resilience for Gender and the Vulnerable	1

Some of the priority adaptation policy actions we have presented will yield positive synergies with mitigation policy actions⁷.

⁷ Refer to the Annex 2 for the detail description on adaptation policy actions

3. Means of Implementation

3.1 Investment Requirements

In the 10-year period, Ghana intends to mobilize nearly USD 22.6 billion investment from both domestic and international public and private sources. USD 6.3 billion domestically (28.3% of total investment) will be mobilized nationally whereas the USD 16 billion will come from international support.

Out of the USD 22.6 billion investment, USD 9.81 billion (representing 45 % of the total investment) is needed for mitigation whereas the remaining USD 12.79 billion⁸ will be required for adaptation.

For mitigation, the USD 9.81 billion is the total investment cost for implementing the 20 transformational mitigation actions over the 10-year period (2020-2030). Out of the USD 9.81 billion, Ghana will mobilize USD 2.02 billion (21% of the total investment cost) to finance the two unconditional INDCs. An additional USD 7.79 billion will be needed to finance the remaining 18 mitigation actions in order to achieve more ambitious emission reductions in the 10 year period.

For Adaptation, Ghana will mobilize USD 4.21 billion (34%) at the national level. The remaining USD 8.29 billion is the international contribution Ghana is looking for in order to meet the cost of implementing its adaptation actions.

3.2 Sources of Finance

No	Sources	Indicative Amounts (Billion) - (\$)	% of total investment
Domestic sources			
1	National Budget	1.4	6.2
2	Corporate Social Responsibility	1.7	7.5
3	Commercial facilities	3.2	14.2
International sources			
3	Green climate fund	5.0	22.1
4	Other multilateral funds	1.1	4.9
5	Bilateral agreements	2.8	12.4
6	Private capital investment	3.8	16.8
7	International carbon market	3.6	15.9
Total		22.6	100

⁸ The cost of adaptation is indicative. Revised cost from financial analysis will be presented before 2020

3.3 Technology and Capacity Needs

Without the requisite technology, the technical capacity and favorable conditions that stimulate innovation, Ghana will not have the capability to fully implement its INDC. In this regard, Ghana will be looking for international partnerships to take advantage of the opportunities for technology development and transfer and continuous up-skilling especially in the priority INDC sectors.

4. Monitoring Report and Verification (MRV)

Ghana recognizes that an MRV system is the cornerstone to ensure the successful implementation of its INDC mitigation and adaptation actions.

Ghana's MRV system for the INDC will be an integral part of the existing national development monitoring and evaluation structures which incorporates sector-based periodic information review through Annual Progress Report (APR) system. The MRV for the INDC will build on the existing APR system by enhancing the technical functionalities and with proper institutional coordination. This will bring about transparency and accountability in the implementation of Ghana's INDC actions.

The MRV system will be deployed to track progress towards achieving INDC goals as well as any modifications in the priority policy actions that will be implemented to attain the INDC goals that have been put forward.

5. Fairness and Ambition

Ghana is of the view that the mitigation and adaptation actions in the INDC it has put forward represents a reasonable level of responsibility it can take as its share of the global effort taking into account its socio-economic circumstances. In this regard, Ghana considers its INDC to be fair and ambitious for 4 main reasons:

- Ghana undertakes, for the first time, a formal emission reduction obligation to control the growth of its GHG emissions, despite having only emitted 0.1% of global GHG emissions in 2012⁹.
- With Ghana's GHG emissions per capita of 1.3tCO₂e¹⁰, the full implementation of both unconditional and conditional mitigation contribution will lead to a 0.5 tCO₂e reduction in the country's per capita emissions to 0.8tCO₂e by 2030.
- As a developing country, the lack of fiscal space to finance priority issues including poverty reduction policies including investments in education, health and basic infrastructure constrains the country's effort to finance and implement climate mitigation and adaptation policies.

⁹ CAIT 3.0 WIR's climate data explorer (<http://cait.wri.org>).

¹⁰ Emissions included AFOLU sector.

- With the kind of urgent development Ghana needs and the level risk climate change poses to the strategic sectors of its economy such as agriculture, water, infrastructure etc, Ghana must focus on reducing the risk of climate change impacts.

6. National Planning Process

Ghana's INDC was prepared through a comprehensive and participatory process with high-level cabinet approval.

The INDC is anchored in the anticipated 40-year long-term development, the GSGDA II, National Climate Change Policy as well as the Low Carbon Development Strategy. Many national policies, laws and regulation will support implementation in the first 10-year period and beyond with the possibility of mid-term review in 2025.

The proposed measures to achieve the INDC goal will build on existing measures and strategies. The existing legal frameworks will have to be revised accordingly. These revisions are subject to approval by Ghana's Parliament. Details of the national policies and measures that will support the implementation of the INDC are presented in Annex 1 and Annex 2.

Additional Information

Annex 1: Mitigation Policy Actions and emission reduction actions¹¹

INDC Policy Actions	Programme of Action	Supporting national policy & measures	Status	Investment Needs (mil \$)	Co-benefits
Scale up renewable energy penetration by 10% by 2030	Increase small-medium hydro installed capacity up to 150-300MW	<ul style="list-style-type: none"> National Energy Policy National renewable energy Act (Act 832). Set up feed-in-tariff for renewable energy technologies. Established of national renewable energy fund Design renewable energy purchase obligation. Net metering scheme for households 	Conditional	2,214	<ul style="list-style-type: none"> Job creation opportunities through installation and maintenance of about 127.5 million man hours. Reduced consumption of fossil fuel consumption for power generation. Increased electricity access to rural communities and contributed to realize energy security. The electricity demand saving of about 200MW
	Attain utility scale wind power capacity up to 50-150MW				
	Attain utility scale solar electricity installed capacity up to 150-250MW				
	Establish solar 55 mini-grids with an average capacity of 100kW which translates to 10MW				
	Scale up the 200,000 solar home systems for lighting in urban and selected non-electrified rural households				
Promote clean rural households lighting	Increase solar lantern replacement in rural non-electrified households to 2 million.	<ul style="list-style-type: none"> Sustainable Energy Action Plan National bioenergy strategy Phasing out fossil fuel subsidies 		300	<ul style="list-style-type: none"> Avoided GH¢74 million subsidy on kerosene annually. Kerosene savings to the nation of 60,000liters, 150,000liters and 390,000liters.

¹¹ Mitigation actions were selected based on the following key considerations. (1) Government is commitment (policy and financial wise) to get mitigation actions implemented and alignment with government priorities; (2) Enough baseline data exist with clear set targets that can be used for the GHG emissions modeling and assessment of co-benefits; (3) It is possible to estimate investment requirements(estimate pragmatic and reasonable budget) with clear sources of funding; (4) It is possible to estimate sustainable development benefits of the actions; (5) Technology and know-how are available to be deployed in the Ghanaian market; (6) Mitigation actions are already part of the list of 55 NAMAs submitted to the UNFCCC in 2010 and (7) There are existing analytical tools that can be adapted to suit Ghana's unique national circumstance.

Expand the adoption of market-based cleaner cooking solutions	Scale up adoption of LPG use from 5.5% to 50% peri-urban and rural households up to 2030.	<ul style="list-style-type: none"> • Sustainable Energy Action Plan • National Natural Gas Master Plan. • National LPG Programme 		0.6	<ul style="list-style-type: none"> • 39,500 hectares of woodland is saved from degradation. • Reduction in indoor pollution resulting from wood fuel usage. • Reduction in smoke related respiratory and eye diseases • Reduction in household cooking fuel expenditure • Job creation through the manufacture and sale of the efficient stoves
	Scale up access and adoption of 2 million efficient cook stoves up to 2030			50	
Double energy efficiency improvement to 20% in power plants	Scale up 120 MSCF ¹² natural gas replacement of light crude oil for electricity generation in thermal plants.	<ul style="list-style-type: none"> • National Natural Gas Master Plan. 	Unconditional	1,000	<ul style="list-style-type: none"> • Depending on demand scenarios, savings are estimated to be between US\$67 million and US\$610 million. • Projected fuel cost savings over the lifetime of the project are expected to be between US\$94 million and US\$109 million, based on the mid-level gas demand projection. • Income tax - Projected income taxes to be paid by WAPCo to Ghana over the lifetime of the project is in the range of US\$466 million to US\$588 million.
Scale up Sustainable mass transportation	Expansion of inter and intra city mass transportation modes (Rail and bus transit system) in 4 cities ¹³	National Transport Policy	Conditional	1,201	<ul style="list-style-type: none"> • Number of trips by public transportation increased by 10% in the 4 cities. • Number of NMT trips increase by 5% in intervened areas.

¹² Million standard cubic feet

¹³ This is a flagship transformational change INDC action but it is not included in the mitigation actions. Detail analysis on the scope and scale of the action will be provided before 2020.

					<ul style="list-style-type: none"> • Reduction in travel time by at least 8 minutes per trip by public transport. • Traffic congestion levels decreased.
Promote Sustainable utilization of forest resources through REDD+	Continue 10,000ha annual reforestation/afforestation of degraded lands	National Forest and Wildlife Policy.	Unconditional	1,050	<ul style="list-style-type: none"> • Annual 29,000 jobs created. • Annual production of 370 metric ton of staple food
	Double 10,000ha annual reforestation/afforestation of degraded lands translating to 20,000ha on annual basis.	National plantation development strategy	Conditional	1,750	
	Support enhancement of forest carbon stocks through 5,000ha per annum enrichment planting and enforcement of timber felling standards.	National Forest and Wildlife Policy. Timber resource utilization regulation	Conditional	60	<ul style="list-style-type: none"> • Biodiversity conservation
	45% ¹⁴ emission reduction through result-based emission reduction programme in cocoa landscape.	National Forest and Wildlife Policy National REDD+ strategy	Conditional	2,067	<ul style="list-style-type: none"> • Increase 20,000 cocoa farmer incomes by doubling the average yield per hectare. • In reducing deforestation and degradation, the program will help to maintain and conserve the biodiversity that is found within the cocoa-forest landscape.
	Wildfire management in the transition and savannah dry lands in Ghana		Conditional	26	<ul style="list-style-type: none"> • Reduce emissions of short-lived climate pollutants. • Reduce deforestation and improve biodiversity conservation especially in the drylands. • Improve degraded lands for productive use.

¹⁴ Provisional targets. Forest reference level is limited to avoided deforestation. New estimates will be submitted before 2020.

Adopt alternative urban solid waste management	Improve effectiveness of urban solid collection from 70% to 90% by 2030 and disposed all to an engineered landfills for phase-out methane recovery from 40% in 2025 to 65% by 2030	<ul style="list-style-type: none"> • National sanitation strategy. • National bioenergy strategy. • National renewable energy Act (Act 832) • Environmental Protection Act (Act 490) • Environmental Assessment Regulation (LI. 1652) • Sustainable Energy Action Plan. 	Conditional	15	<ul style="list-style-type: none"> • Job creation of about 9 million man hours for 15 years based 250 people working for 8 hours /day. • Improved urban sanitation and waste management. • Improved agricultural yield through the availability of organic fertilizer. • Reduced inorganic fertilizer bill to government
	Scale up 200 institutional biogas in senior high schools and prisons nation wide			5	
	Double the current waste to compost installed capacity of 180,000tonne/annum by 2030 ¹⁵ .			60	
Double energy efficiency improvement to 20% in industrial facilities	Scaling up of installation of power factor correction devices in 1,000 commercial and industrial facilities (capacitor banks).	<ul style="list-style-type: none"> • National Energy Policy • Power factor surcharge for bulk electricity consumers. • Sustainable Energy Action Plan. 	Conditional	8.4	<ul style="list-style-type: none"> • Reduction in electricity demands and expenditure. Direct electricity cost saving to consumers. With an average monthly maximum demand savings of \$ 300 avoided power factor surcharge.
Green Cooling Africa Initiative	Abatement of fluorinated-gases (HFC-22 and HFC-410) from stationery air-conditioners	<ul style="list-style-type: none"> • National ODS phase-out programme. • Management of ODS and product regulation, 2005 (LI. 1812) 	Conditional	0.3	<ul style="list-style-type: none"> • Phase-out ozone depleting substances.

¹⁵ Detail analysis on the scope and scale will be provided before 2020.

Annex 2: Adaptation Policy Actions

INDC Policy Actions	Programme of Actions	Supporting national policy & measures	Investment Needs (mil \$)	Status
Agriculture resilience building in climate vulnerable landscapes	Modified community-based conservation agriculture adopted in 43 administrative districts	Food and Agriculture Sector Development Policy	799	Unconditional
	Scale up penetration of climate smart technologies to increase livestock and fisheries productivity by 10%.	Ghana's Medium-term Agriculture sector investment plan	1,119	Unconditional
	Promote innovations in post-harvest storage and food processing and forest products in 43 administrative districts.	Ghana Agriculture Investment Programme	1,270	Conditional
Value addition-based utilization of forest resources	Governance reform for utilization of forest resources for sustainable energy use and biodiversity business.	National bio-energy strategy. Sustainable energy for all action plan	767	Unconditional
	Manage 413,000ha fragile, ecologically sensitive and culturally significant sites in 22 administrative district in the forest and savannah areas.	National Forest and Wildlife Policy	512	Unconditional
City-wide resilient infrastructure planning	Building standards for strategic infrastructure in housing, transport, coastal, waste management, telecommunication and energy) adopted in 10 urban administrative regions.	Local Government Act 462. National Building Regulation	3,558	Conditional
Early warning and disaster prevention	Expand and modernize the current 22 synoptic stations based on needs assessment, and increase the number to 50 stations for efficient weather information management	Ghana Meteorological Agency Act 682.	403	Conditional
Managing climate-induced health risks	Strengthen climate related disease surveillance in vulnerable communities in 3 Districts.	National Health Policy	919	Conditional
	Adopt climate change informed health information systems including traditional knowledge on health risk management.		492	Unconditional
Integrated water resources management	Strengthen equitable distribution and access to water for 20% of the population living in climate change risk communities.	National Water Policy	1,919	Unconditional
Resilience for gender and the vulnerable	Implementation of community led adaptation and livelihood diversification for vulnerable groups	National climate change policy	1,023	Unconditional