

**PUBLIC SERVICE COMMISSION  
OF MARYLAND**

**RENEWABLE ENERGY PORTFOLIO  
STANDARD REPORT**

**With Data for Calendar Year 2022**

In compliance with §7-712 of  
the Public Utilities Article,  
*Annotated Code of Maryland*

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November 2023

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## I. INTRODUCTION

This document constitutes the annual report of the Public Service Commission of Maryland regarding the implementation of the Maryland Renewable Energy Portfolio Standard (RPS) Program, with data for calendar year 2022. This report is submitted pursuant to §7-712 of the Public Utilities Article (PUA), *Annotated Code of Maryland*, which requires the Commission to report to the General Assembly on the status of the implementation of the RPS Program on or before December 1 of each year.<sup>1</sup> The Maryland RPS Program is designed to support a stable and predictable market for energy generated from renewables, and to lower the cost to consumers of electricity produced from these resources. Implementation of the RPS Program assists in overcoming market barriers seen as impediments to the development of the industry. Moreover, increasing reliance upon renewable energy technologies to satisfy electric power requirements can result in long-term emission reductions, increased fuel diversity, and economic benefits to the State.<sup>2</sup>

The calendar year 2022 electricity supplier compliance reports, as verified by the Commission, indicate that the State of Maryland RPS obligations were almost entirely fulfilled through the submission of the appropriate level of Tier 1 and Tier 2 Renewable Energy Credits (RECs).<sup>3</sup> Remaining calendar year 2022 RPS obligations were satisfied by compliance fees, also known as Alternative Compliance Payments (ACPs).

### A. Objectives of the Program

The objective of PUA §7-701 *et seq.* (the RPS statute) is to recognize and to develop the benefits associated with a diverse portfolio of renewable energy resources to serve Maryland. The State's RPS Program does this by recognizing the environmental and consumer benefits associated with renewable energy. The RPS Program requires electricity suppliers to supply a prescribed minimum portion of their retail electricity sales with various renewable energy resources, which have been classified within the RPS statute as Tier 1 and Tier 2 renewable resources. The program is implemented through the creation, sale, and transfer of RECs.

The development of renewable energy resources is further promoted by requiring electricity suppliers to provide an ACP for failing to acquire sufficient RECs to satisfy the RPS as set forth in PUA §7-703. Compliance fees are deposited into the Maryland Strategic Energy Investment Fund (SEIF) as dedicated funds to provide for loans and grants that spur the creation of new Tier 1 renewable energy resources in the State. Responsibility for developing renewable energy resources is vested with the Maryland Energy Administration (MEA).

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<sup>1</sup> Electricity suppliers must file an RPS compliance report with the Commission for the prior calendar year by April 1st of the subsequent year. Consequently, this report, which is due to the General Assembly in December 2023, highlights data from electricity suppliers' 2022 compliance reports and other relevant 2022 data. In compliance with PUA §7-712, topics addressed in this report include the availability of Tier 1, Tier 1 Solar, and Tier 2 renewable energy sources, compliance fees collected to support in-State renewable projects, and other pertinent information.

<sup>2</sup> See PUA §7-702, which describes the legislative intent and legislative findings in support of the enactment of the Maryland Renewable Energy Portfolio Standard.

<sup>3</sup> See Section I.B.2 for a description of eligible Tier 1 and Tier 2 resources and requirements.

## B. Overview of the Maryland RPS Program

Under the RPS Program, Maryland electricity suppliers are required to demonstrate compliance on an annual basis with an escalating renewable energy portfolio standard. This requirement applies to both competitive retail suppliers and electric companies in the state, including those that provide Standard Offer Service.<sup>4</sup> Electricity suppliers must file annual compliance reports with the Commission verifying that the renewable requirement for each entity has been satisfied.

A REC constitutes the renewable attributes associated with one megawatt-hour (MWh) of electricity generated using eligible renewable resources. As such, a REC is a uniquely-identified tradable commodity equal to one MWh of electricity generated or obtained from an eligible renewable energy resource. While RECs are often bundled and sold with the generated electricity, RECs can be traded separately. Generators and electricity suppliers may trade RECs using a Commission-approved system known as the Generation Attributes Tracking System (GATS). The GATS system is operated by PJM Environmental Information Services, Inc. (PJM-EIS) and is designed to track the ownership and trading of generation attributes.<sup>5</sup> A REC has a three-year lifespan during which it may be transferred, sold, or redeemed. However, each electricity supplier must document annually the retirement of RECs equal to the percentage specified by the RPS statute<sup>6</sup> or pay an ACP commensurate with any shortfalls.

### 1. Registration of Renewable Energy Facilities

Facilities eligible for the Maryland RPS Program must be in PJM (the wholesale bulk power control area in which Maryland resides)<sup>7</sup> or an adjacent control area,<sup>8</sup> so long as the electricity produced is delivered into the PJM region. However, facilities generating electricity from solar energy, geothermal, poultry litter-to-energy, waste-to-energy, or refuse-derived fuel

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<sup>4</sup> Standard Offer Service (SOS) is electricity supply purchased from an electric company by the company's retail customers who cannot or choose not to transact with a competitive supplier operating in the retail market. *See* PUA §§7-501(n), 7-510(c).

<sup>5</sup> An attribute is "a characteristic of a generator, such as location, vintage, emissions output, fuel, state RPS Program eligibility, etc." PJM-EIS, *GATS Operating Rules* (May 2014) at 3.

<sup>6</sup> Using the Tier 2 RPS requirement as an example, assume a hypothetical electricity supplier operating in the state had 100,000 MWh in retail electricity sales for 2021. In 2021, the Tier 2 requirement was 2.5 percent; therefore, the electricity supplier would have to either verify the purchase of 2,500 Tier 2 RECs or pay an ACP for deficits. Similar requirements apply to Tier 1 and Tier 1 Solar, although the percentage obligation and ACP denomination differs depending on the tier and calendar year, as outlined by the RPS Statute.

<sup>7</sup> The PJM wholesale market includes all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

<sup>8</sup> A control area is an "electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other Control Areas and contributing to frequency regulation. For the purposes of this document, a Control Area is defined in broad terms to include transmission system operations, market, and load-serving functions within a single organization. A Control Area operator may be a system operator, a transmission grid operator, or a utility." PJM-EIS, *Generation Attribute Tracking System (GATS) Operating Rules* (April 2018) at 5. For example, the multi-state area controlled by the PJM Regional Transmission Operator is one control area, as is the adjacent Midwest Independent System Operator (MISO) multi-state area, and the adjacent New York ISO.

are eligible only if the facility is connected to the electric distribution grid serving Maryland. Finally, energy from a thermal biomass system must be used in Maryland to qualify for the RPS program.<sup>9</sup>

Before recommending certification of a Renewable Energy Facility (REF), Commission Staff must determine whether the facility meets the standards set forth by the RPS statute and Commission regulations (COMAR 20.61). REF applicants who qualify under Maryland's RPS Program must complete the appropriate application for REF certification posted on the Commission's RPS website.<sup>10</sup> In addition to the geographic requirements, applicants must also meet the fuel source requirements associated with Tier 1 or Tier 2 (*see* Table 1 below). Verification of the fuel source is completed with the aid of Energy Information Administration Form 860 (EIA-860) to validate each facility's rated nameplate capacity, fuel source(s), location, and commercial operation in-service date.<sup>11</sup> Facilities that co-fire a REC-eligible renewable fuel source with non-eligible fuel sources must also submit a formula or methodology to account for the proportion of total electricity generated by the eligible fuel sources, which then may be credited with RECs. In addition to obtaining Commission certification, all REFs must register with GATS to track and transact business related to RECs. The GATS account must be established with the certification number issued by the Commission upon approval of the REF application.

## 2. Maryland RPS Annual Percentage Requirements

To comply with the Maryland RPS Program, electricity suppliers must acquire RECs derived from Maryland-certified Tier 1 and Tier 2 renewable sources, as defined in PUA §7-701. Eligible fuel sources for Tier 1 RECs and Tier 2 RECs are listed in Table 1; solar has its own standard within Tier 1.

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<sup>9</sup> There are currently no thermal biomass facilities in Maryland.

<sup>10</sup> REF applications are maintained by the Commission and are accessible online, available at: <https://www.psc.state.md.us/electricity/description-documents-maryland-renewable-energy-portfolio-standard-program/>.

<sup>11</sup> Submitting Form EIA-860 is a requirement under Section 13(b) of the Federal Energy Administration Act of 1974 (Public Law 93-275) for generating plants, regulated and unregulated, which have a nameplate rating of 1 MW or more, are operating or plan to operate within 5 years, and are connected to the transmission grid.

**Table 1 Eligible Tier 1 and Tier 2 Sources**

Tier 1 Renewable Sources	Tier 2 Renewable Sources
<ul style="list-style-type: none"> <li>• Solar, including energy from photovoltaic technologies and solar water heating systems</li> <li>• Wind</li> <li>• Qualifying Biomass</li> <li>• Methane from a landfill or wastewater treatment plant</li> <li>• Geothermal</li> <li>• Ocean</li> <li>• Fuel Cell that produces electricity from a Tier 1 source</li> <li>• Hydroelectric power plant less than 30 MW capacity</li> <li>• Poultry litter-to-energy</li> <li>• Waste-to-energy</li> <li>• Refuse-derived fuel</li> <li>• Thermal energy from a thermal biomass system</li> </ul>	<ul style="list-style-type: none"> <li>• Hydroelectric power other than pump storage generation</li> </ul> <p><i>(Note: Tier 1 RECs may be used to satisfy Tier 2 obligations)</i></p>

As shown in Table 2 below, there is a different percentage schedule corresponding to each tier and set-aside requirement comprising the Maryland RPS Program.

- The Tier 1 requirements gradually increase until peaking in 2030, after which they are maintained at those levels.
- The Tier 1 Solar set-aside requirement increases from 5.5 percent in 2022 to 14.5 percent by 2030.<sup>12</sup> This ramp-up period for the solar carve-out corresponds in part with the implementation of the pilot program on community solar energy generating facilities, which was established by the passage of Senate Bill 398 and House Bill 1087 and signed into law in May 2015. The three-year pilot program was extended through 2024 by House Bill 683, enacted in May 2019. This pilot was made into a permanent program with the passage of House Bill 908 in May 2023. There is a potential that Solar Renewable Energy Credits (SRECs) generated by eligible community solar facilities could serve to help meet the increasing Tier 1 Solar set-aside in the coming years.

<sup>12</sup> “Tier 1 Solar set-aside” refers to the requirement to obtain RECs for energy derived from qualified solar energy facilities. The Tier 1 Solar set-aside requirement applies to retail electricity sales in the State by electricity suppliers and is a sub-set of the Tier 1 standard.

- Beginning in 2017, a constant Tier 1 Offshore Wind set-aside of up to 2.5 percent commenced as part of the Tier 1 portfolio.<sup>13</sup> In Order No. 88192, the Commission established specific offshore wind carve-outs from 2021 through 2042 ranging from 0.60 percent to 2.03 percent. Senate Bill 516, enacted in May 2019, increased the RPS requirements to 50 percent by 2030, and established additional offshore wind carve-outs beginning in 2027.
- Beginning in 2023, a Tier 1 geothermal set-aside of up to 0.05 percent will commence as part of the Tier 1 portfolio, rising to 1.0 percent in 2028.
- Maryland’s Tier 2 requirement of 2.5 percent was re-established by Senate Bill 65 in 2021.

**Table 2 Annual RPS Requirements by Tier**

<b>Compliance Year</b>	<b>Tier 1 (Excluding Carve-outs)</b>	<b>Solar</b>	<b>Offshore Wind<sup>14</sup></b>	<b>Post 2022 Geothermal</b>	<b>Tier 2</b>	<b>Total</b>
2022	23.24%	5.50%	N/A	N/A	2.50%	32.60%
2023	23.82%	6.00%	N/A	0.05%	2.50%	34.40%
2024	26.91%	6.50%	0.14%	0.15%	2.50%	36.20%
2025	26.59%	7.00%	1.66%	0.25%	2.50%	38.00%
2026	26.89%	8.00%	2.61%	0.50%	2.50%	40.50%
2027	18.23%	9.50%	13.02%	0.75%	2.50%	44.00%
2028	17.98%	11.00%	13.02%	1.00%	2.50%	45.50%
2029	22.98%	12.50%	13.02%	1.00%	2.50%	52.00%
2030+	21.48%	14.50%	13.02%	1.00%	2.50%	52.50%

At certain renewable procurement cost thresholds, an electricity supplier can request that the Commission consider a delay in scheduled Tier 1 and Tier 1 Solar RPS percentages.<sup>15</sup> To date, no such request has been made by electricity suppliers operating in the Maryland marketplace.

<sup>13</sup> The Maryland Offshore Wind Energy Act of 2013 (2013 Md. Laws, Ch. 003) established an offshore wind set-aside within the Tier 1 requirement. Beginning in 2017, Tier 1 may include a Commission-determined amount of offshore wind RECs (ORECs), not to exceed 2.5 percent. The project must be generating RECs in order for the obligation to begin. In the absence of a Commission-determined OREC obligation, electricity suppliers must satisfy the carve-out using RECs derived from other Tier 1 renewable sources.

<sup>14</sup> This percentage includes only the Commission-approved offshore wind energy carve-out from Order No. 88192 and Order No. 90011.

<sup>15</sup> PUA §7-705(e)-(f).



### 3. Maryland RPS Alternative Compliance Payment Requirements

Electricity suppliers who do not meet their RPS obligation through the retirement of eligible RECs must submit an ACP for every unit of shortfall. Table 3 presents the ACP schedule separated by tiers for each compliance year of the RPS Program moving forward.

**Table 3 ACP Schedule (\$/MWh)**

<b>Compliance Year</b>	<b>Tier 1 (Excluding Carve-outs)</b>	<b>Solar</b>	<b>Post 2022 Geothermal</b>	<b>Tier 2</b>	<b>IPL<sup>16</sup> Tier 1</b>
2022	\$30	\$60	N/A	\$15	\$2
2023	\$30	\$60	\$100	\$15	\$2
2024	\$27.50	\$60	\$100	\$15	\$2
2025	\$25	\$55	\$100	\$15	\$2
2026	\$24.75	\$45	\$90	\$15	\$2
2027	\$24.50	\$35	\$80	\$15	\$2
2028	\$22.50	\$32.50	\$65	\$15	\$2
2029	\$22.50	\$25	\$65	\$15	\$2
2030+	\$22.35	\$22.50	\$65	\$15	\$2

ACPs are remitted to the Maryland SEIF. Pursuant to State Government Article, §9–20B–05(i), Alternative Compliance Payment revenues under the RPS are now required to be used to benefit low-income renewable energy projects.

## **II. ELECTRICITY SUPPLIER COMPLIANCE REPORTS**

Calendar year 2022 marked the 17th compliance year for the Maryland RPS. The RPS compliance reports submitted to the Commission by electricity suppliers, along with information obtained from GATS, provide information regarding the retired RECs and the underlying REFs (*e.g.*, type and location of generators) utilized by electricity suppliers to comply with Maryland

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<sup>16</sup> Industrial Process Load (IPL) means the consumption of electricity by a manufacturing process at an establishment classified in the manufacturing sector under the North American Industry Classification System. Under PUA §7-705(b)(2) and COMAR 20.61.01.06.E(5), a supplier sale for IPL is required to meet the entire Tier 1 obligation for electricity sales, including solar. However, the ACP for an IPL Tier 1 non-solar shortfall and a Tier 1 Solar shortfall is the same. For IPL, there is no ACP for Tier 2 shortfalls.

RPS obligations.<sup>17</sup> RPS compliance reports were filed by 108 electricity suppliers, including: 78 competitive retail suppliers; 19 brokers or competitive electricity suppliers with zero retail electricity sales; and 11 electric companies, of which four are investor-owned utilities.

According to the filed compliance reports, there were approximately 58.9 million MWh of total retail electricity sales in Maryland for 2022 (up from 58.7 million MWh in 2021); 57.8 million MWh of retail electricity sales were subject to RPS compliance and 1.2 million MWh were exempt.<sup>18</sup> Maryland electricity suppliers retired about 16.1 million RECs in 2022, more than the 15.2 million RECs retired for compliance in 2021 and the 14.3 million RECs retired in 2020. The total cost of RECs retired in 2022 was \$355.4 million, up from \$332.7 million in 2021.

Table 4 displays the average cost per REC retired in each tier since 2008. The increase in REC prices likely reflects the increasing RPS requirements. The rise in SREC prices may be attributable to an increase in demand for SRECs due to the effects of the Clean Energy Jobs Act.<sup>19</sup>

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<sup>17</sup> According to PUA §7-709, a REC can be diminished or extinguished before the expiration of three years by: the electricity supplier that received the credit; a nonaffiliated entity of the electricity supplier that purchased or otherwise received the transferred credit; or demonstrated noncompliance by the generating facility with the requirements of PUA §7-704(f). In the PJM region, the regional term of art is “retirement,” which describes the process of removing a REC from circulation by the REC owner, *i.e.*, the owner “diminishes or extinguishes the REC.” PJM-EIS, *GATS Operating Rules* (May 2014) at 54-56.

<sup>18</sup> According to PUA §7-703(a)(2), exceptions for the RPS requirement may include: IPL which exceeds 300,000,000 kWh by a single customer in a year; regions where residential customer rates are subject to a freeze or cap (*see* PUA §7-505); or electric cooperatives under a purchase agreement that existed prior to October 1, 2004, until the expiration of the agreement. COMAR 20.61.01.06(D) exempts any sale of electricity that is marketed or otherwise represented to customers as renewable or having characteristics of a Tier 1 renewable source or Tier 2 renewable source.

<sup>19</sup> Chapter 673 of the Laws of Maryland 2021.

**Table 4 Average Cost of RECs per Tier (2008 – 2022)**

<b>Year</b>	<b>Tier 1 Non-Solar</b>	<b>Tier 1 Solar</b>	<b>Tier 2</b>
2008	\$0.94	\$345.45	\$0.56
2009	\$0.96	\$345.28	\$0.43
2010	\$0.99	\$328.57	\$0.38
2011	\$2.02	\$278.26	\$0.45
2012	\$3.19	\$201.92	\$0.44
2013	\$6.70	\$159.71	\$1.81
2014	\$11.64	\$144.06	\$1.81
2015	\$13.87	\$130.39	\$1.71
2016	\$12.22	\$110.63	\$0.96
2017	\$7.14	\$38.18	\$0.48
2018	\$6.54	\$31.91	\$0.66
2019	\$7.77	\$47.26	\$1.05
2020	\$8.24	\$66.10	\$1.06
2021	\$14.36	\$72.59	\$6.45
2022	\$17.80	\$57.80	\$7.42

As demonstrated by Table 5, the aggregated cost of compliance with the Maryland RPS Program in 2022 displays a moderate decline from 2021. While costs had been moderately increasing with time, a spike in prices occurred in 2021. This was driven in part by an increase in the requirement for retired Solar RECs, resulting in large quantities of ACPs needing to be purchased. Despite an increase in compliance costs for Tier 1 and Tier 2 RECs in 2022, with fewer Solar RECs being required to be retired, the overall cost of compliance was reduced.

**Table 5 Total Cost of RECs per Year (2017 – 2022)**

	Tier	2017	2018	2019	2020	2021	2022
<b>Total REC Costs</b>	Tier 1	\$50,045,621	\$56,406,247	\$79,320,505	\$99,836,127	\$187,346,301	\$246,480,883
	Solar	\$21,275,664	\$27,351,388	\$55,166,116	\$122,943,987	\$144,411,601	\$101,384,663
	Tier 2	\$687,785	\$1,049,293	\$58,899	\$386,590	\$959,225	\$4,382,570
	ACPs	\$55,032	\$67,796	\$7,730,223	\$52,240	\$77,129,013	\$86,584,883
	<b>Total</b>	<b>\$72,064,102</b>	<b>\$84,874,724</b>	<b>\$142,275,743</b>	<b>\$223,218,944</b>	<b>\$409,846,140</b>	<b>\$438,832,999</b>
<b>Total RECs Retired</b>	Tier 1	7,006,113	8,627,737	10,210,275	12,117,585	13,045,432	13,849,611
	Solar	557,224	857,232	1,167,329	1,859,976	1,989,505	1,753,987
	Tier 2	1,448,567	1,599,819	55,879	366,260	148,702	590,330
	<b>Total</b>	<b>9,011,904</b>	<b>11,084,788</b>	<b>11,433,483</b>	<b>14,343,821</b>	<b>15,183,639</b>	<b>16,193,928</b>
	<b>RPS % Required</b>	Tier 1	11.95%	14.30%	15.20%	22.00%	23.30%
Solar		1.15%	1.50%	5.50%	6.00%	7.50%	5.50%
Tier 2		2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
<b>Total</b>		<b>15.60%</b>	<b>18.30%</b>	<b>23.20%</b>	<b>30.50%</b>	<b>33.30%</b>	<b>32.60%</b>

Due to a significant shortfall in available SRECs, ACPs accounted for a significant portion (\$86.6 million) of the total \$438.8 million RPS compliance costs in 2022. Prior to 2021, reliance on ACPs had been limited.

**Table 6 Results of the 2022 RPS Compliance Reports**

RPS Compliance Year		Tier 1 Non-Solar	Tier 1 Solar	Tier 1 IPL	Tier 2	Total
2022	RPS Obligation	13,796,451	3,181,323	0	592,758	17,570,532
	Retired RECs	13,849,611	1,753,987	0	590,330	16,193,928
	ACP Required	\$677,490	\$85,859,393	\$0	\$48,000	\$86,584,883

*Note: Some electricity suppliers retired more RECs than required.*

RECs are valid to demonstrate RPS compliance for the calendar year in which they were generated and in the following two calendar years.<sup>20</sup> Figure 1 aggregates the Maryland RPS tiers on the basis of generation year. For the 2022 compliance year, 55.0 percent of RECs retired were generated in 2022; 32.6 percent were generated in 2021; and the remaining 12.5 percent were generated in 2020. This data conveys that RECs are in high demand as they are most often retired in the year of their generation.

<sup>20</sup> COMAR 20.61.03.01C (unless the REC is diminished or extinguished before expiration).

**Figure 1 RECs Retired in 2022 by Generation Year**

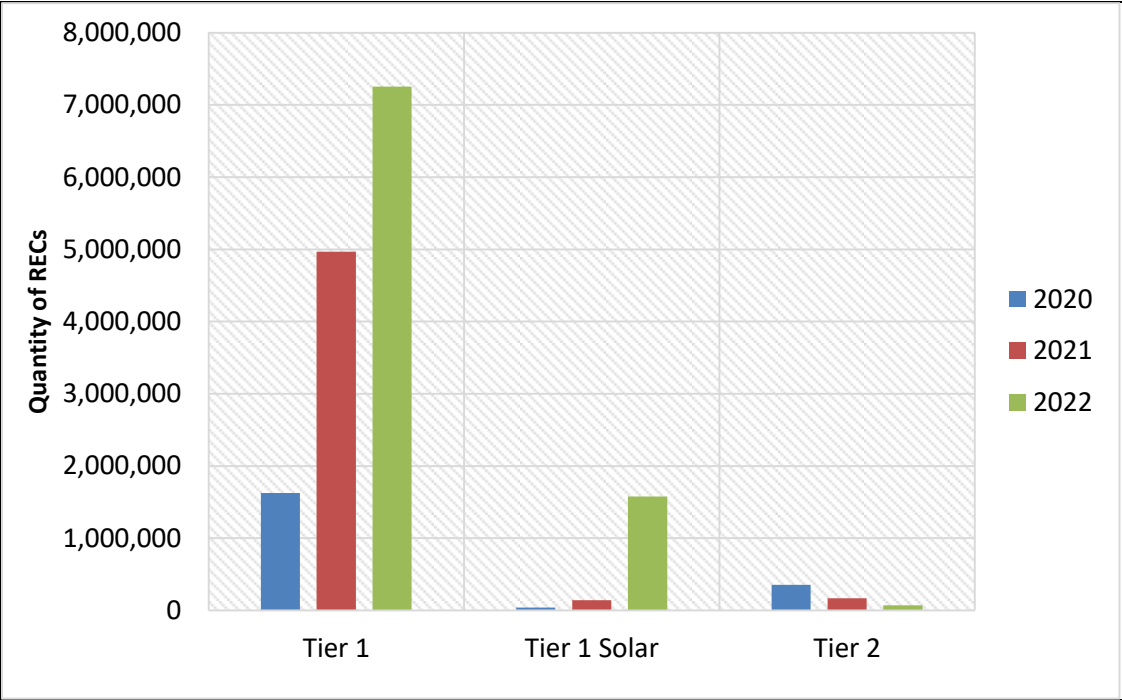
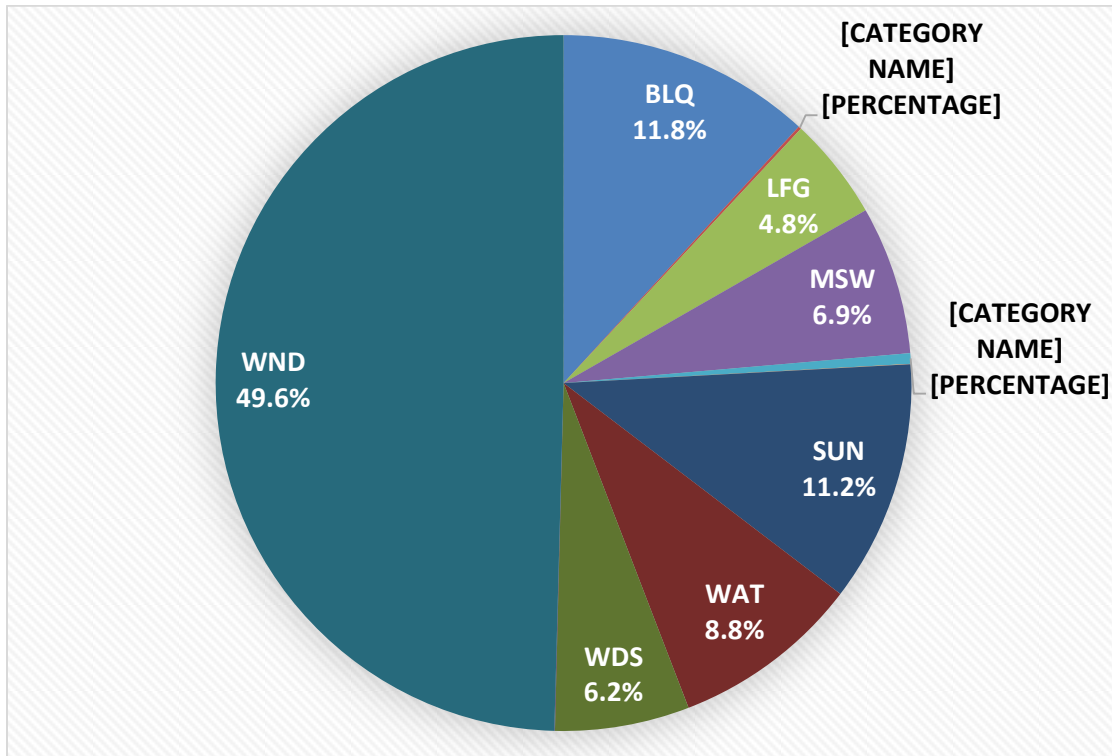


Figure 2 illustrates the fuel sources used to satisfy Tier 1 RPS requirements for the 2022 RPS compliance year. Of the Tier 1 RECs retired for 2022, the resources from which the RECs were sourced consisted primarily of wind, black liquor, and small-scale hydroelectric water systems (less than 30 MW capacity systems). Although not pictured, Tier 2 RPS requirements for the 2022 RPS compliance year were satisfied exclusively by RECs derived from hydroelectric power.

**Figure 2 2022 Tier 1 Retired RECs by Fuel Source<sup>21</sup>**

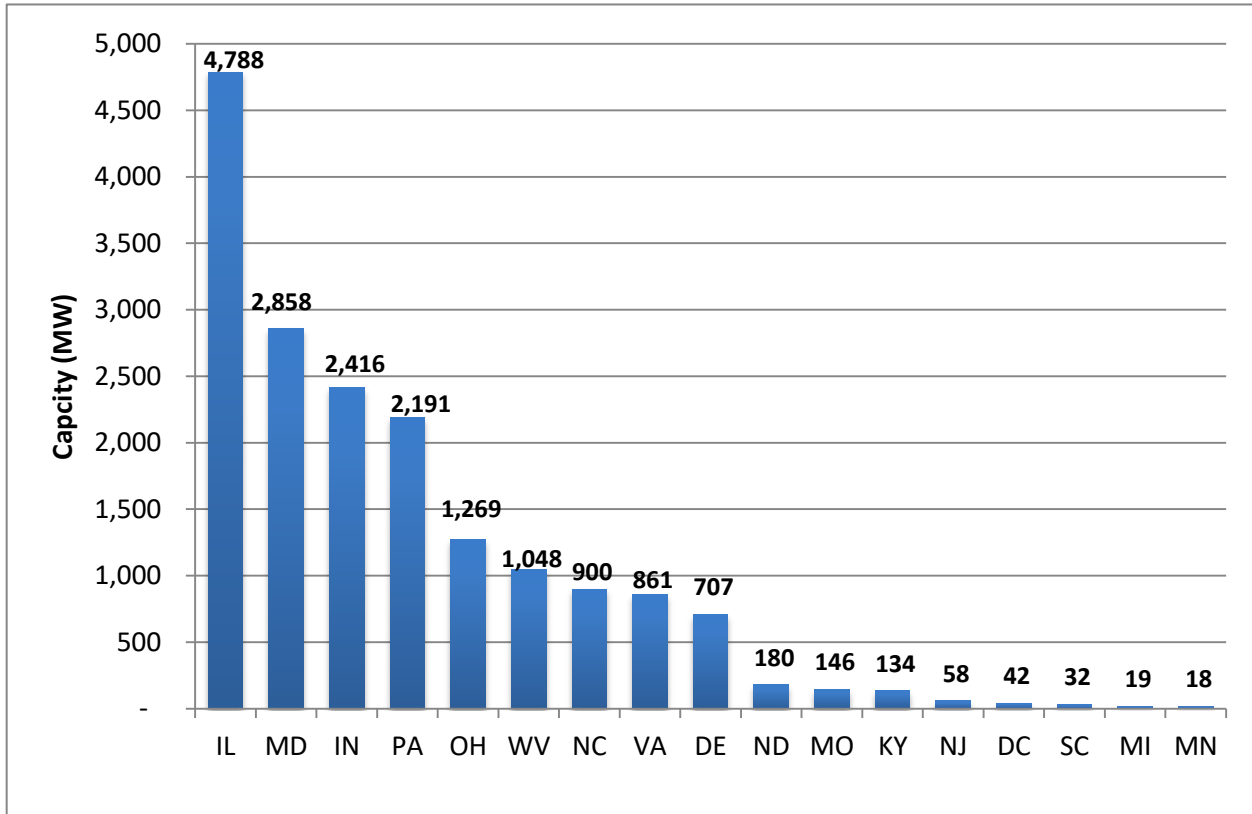


Abbreviations: BLQ, Black Liquor; LFG, Landfill Gas; GEO, Geothermal; MSW, Municipal Solid Waste; OBG, Other Biomass Gas; SUN, PV solar; WAT, Hydroelectric; WDS, Wood and Waste Solids; WND, Wind.

Figure 3 presents the geographical location and the total generating capacity (17,666 MW) for all Maryland RPS-certified facilities regardless of Tier. RPS requirements also exist in the surrounding states, which generally support out-of-state and regional market participation. Illinois is the largest single contributor, with over 98 percent of its registered capacity being wind generation.

<sup>21</sup> WAT includes Tier 1 only. Solar thermal and geothermal contributed too few RECs to be seen on the chart.

**Figure 3 Total Rated Capacity by State (MW)<sup>22</sup>**

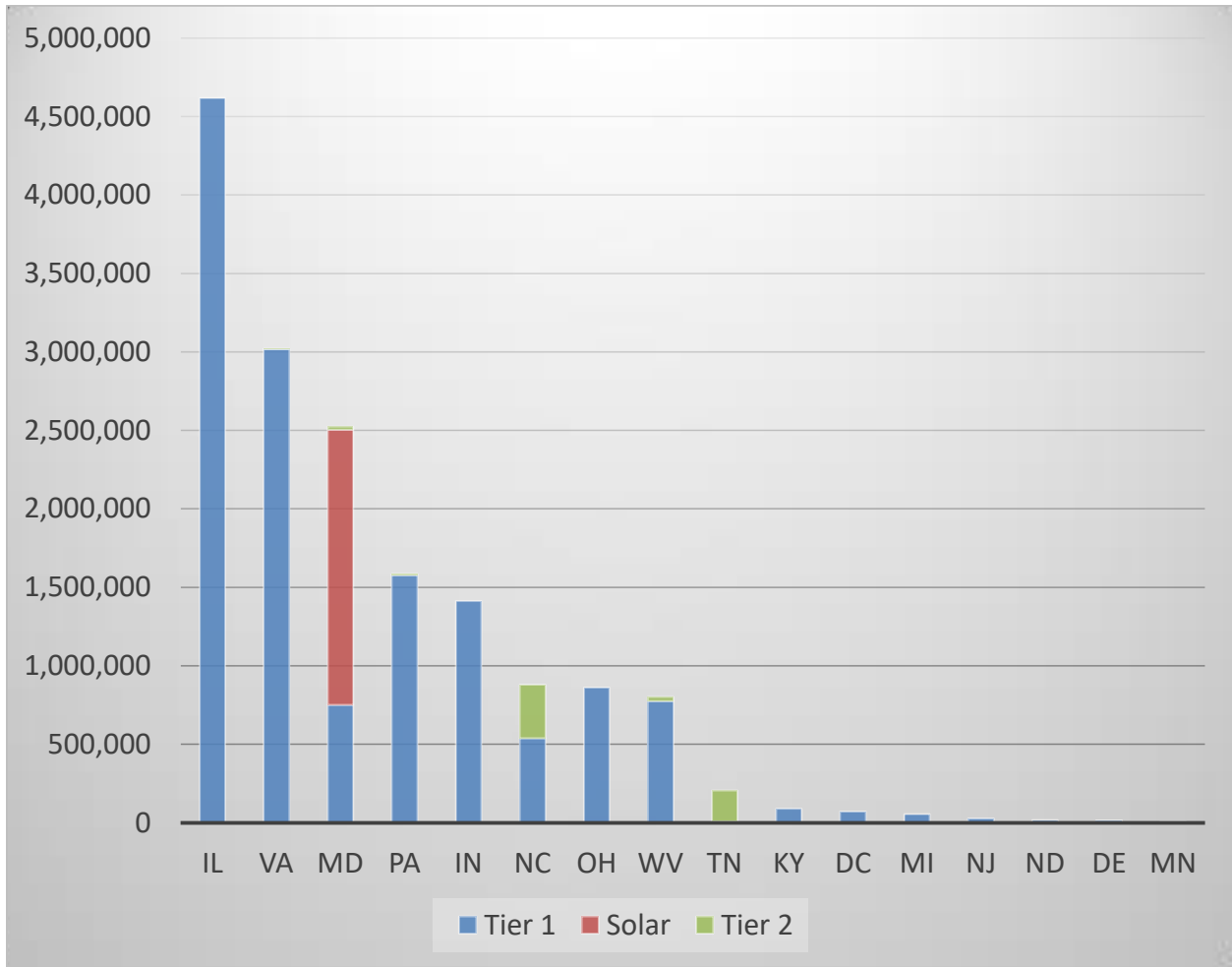


For the 2022 compliance year,.

Figure 4 displays aggregated REC data to convey general relationships among the states that contributed RECs. Illinois supplied the largest number of RECs purchased by retail electric suppliers (28.5 percent), followed by Virginia (18.7 percent), Maryland (15.6 percent), and Pennsylvania (9.8 percent). The remaining 12 states contributed a total of 27.4 percent of all RECs retired in 2022. The majority of RECs from in-State generators were sourced from Tier 1 non-solar (30.5 percent) and solar photovoltaic (69.5 percent).

<sup>22</sup> PJM-EIS, Generation Attribute Tracking System, Database query, (October 1, 2023). The information in this figure does not include Commission-authorized REFs that have not established a REC account with PJM GATS.

**Figure 4 Number of RECs Retired by Facility Location (2022)**



**Table 7 and Table 8 provide the quantitative data in support of the previous figure.**

Table 7 provides the reported levels of RECs retired by Maryland electricity suppliers in 2022 on a tier and aggregate basis, whereas Table 8 provides the information on a percentage basis. As noted above, Illinois-generated RECs, followed by Virginia, Maryland, and



Pennsylvania were used in the largest aggregate amounts by Maryland electricity suppliers for 2022 RPS compliance.

**Table 7 2022 RECs Retired by State**

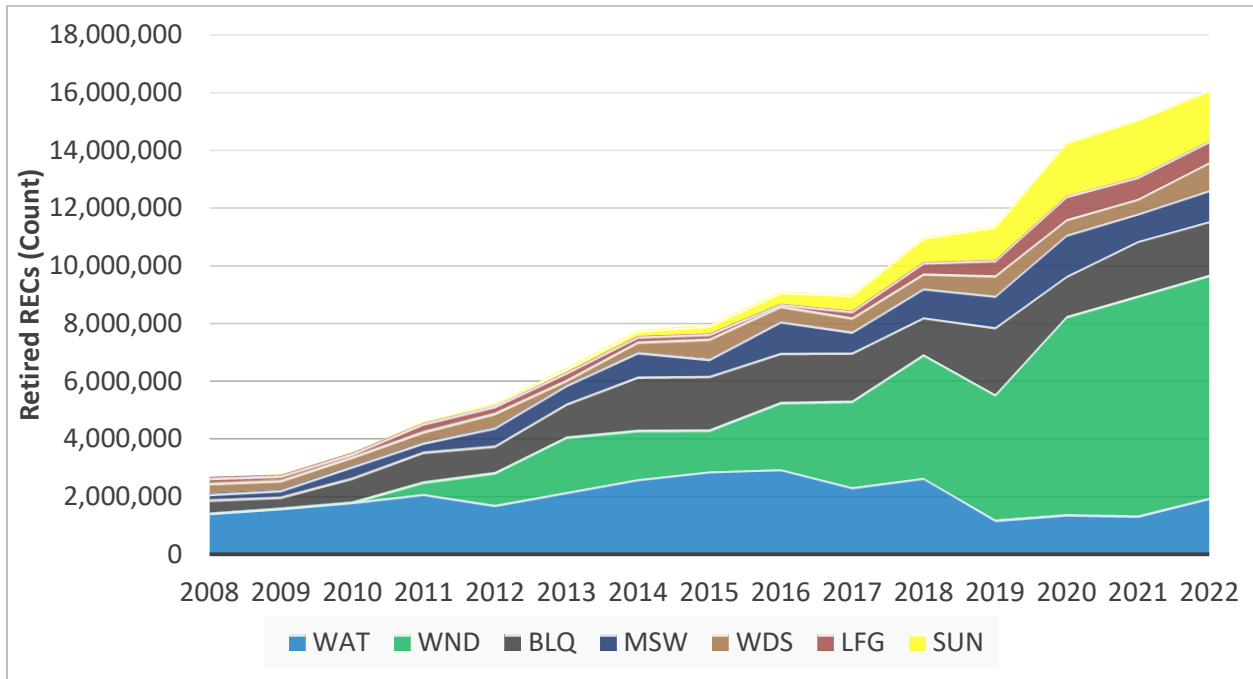
<b>State</b>	<b>Tier 1</b>	<b>Solar</b>	<b>Tier 2</b>	<b>All Tiers</b>
IL	4,617,385	0	0	4,617,385
VA	3,018,067	0	2,500	3,020,567
MD	751,054	1,753,987	20,000	2,525,041
PA	1,578,684	0	7,119	1,585,803
IN	1,412,349	0	0	1,412,349
NC	539,240	0	340,337	879,577
OH	862,708	0	0	862,708
WV	775,926	0	24,685	800,611
TN	10,000	0	195,689	205,689
KY	90,585	0	0	90,585
DC	71,982	0	0	71,982
MI	54,758	0	0	54,758
NJ	27,068	0	0	27,068
ND	17,508	0	0	17,508
DE	15,103	0	0	15,103
MN	7,194	0	0	7,194
<b>Total</b>	<b>13,849,611</b>	<b>1,753,987</b>	<b>590,330</b>	<b>16,193,928</b>

**Table 8 2022 RECs Retired by State (%)**

<b>State</b>	<b>Tier 1</b>	<b>Solar</b>	<b>Tier 2</b>	<b>All Tiers</b>
IL	33.3%	0.0%	0.0%	28.5%
VA	21.8%	0.0%	0.4%	18.7%
MD	5.4%	100.0%	3.4%	15.6%
PA	11.4%	0.0%	1.2%	9.8%
IN	10.2%	0.0%	0.0%	8.7%
NC	3.9%	0.0%	57.7%	5.4%
OH	6.2%	0.0%	0.0%	5.3%
WV	5.6%	0.0%	4.2%	4.9%
TN	0.1%	0.0%	33.1%	1.3%
KY	0.7%	0.0%	0.0%	0.6%
DC	0.5%	0.0%	0.0%	0.4%
MI	0.4%	0.0%	0.0%	0.3%
NJ	0.2%	0.0%	0.0%	0.2%
ND	0.1%	0.0%	0.0%	0.1%
DE	0.1%	0.0%	0.0%	0.1%
MN	0.1%	0.0%	0.0%	0.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Figure 5 illustrates the growth in RECs retired in total and by fuel type from the introduction of the solar carveout of the RPS requirement in 2008. For the fourth year in a row, wind was the largest contributor of total number of RECs. Total wind RECs retired for compliance have tripled since 2016. In 2020, solar REC retirements grew to be the second largest contributor of RECs, but solar was replaced by hydroelectric in 2022, due to the reintroduction of the Tier 2 requirement. Note that the contributions from qualifying biomass sourced from agricultural crops, geothermal, other biomass liquid and gas, and solar thermal are too small to be seen on this chart.

**Figure 5 RECs Retired by Fuel Type (2008 – 2022)<sup>23</sup>**

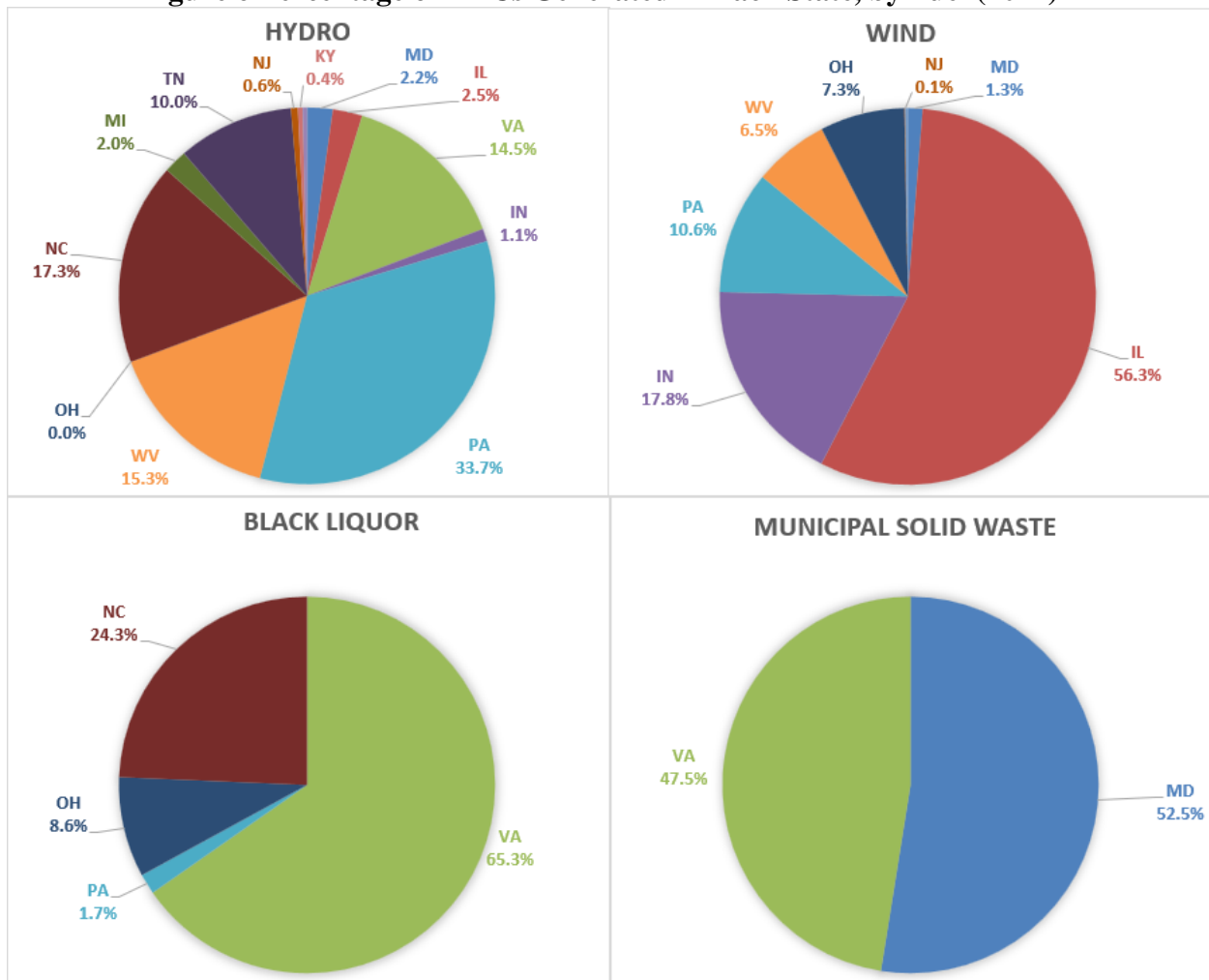


Abbreviations: BLQ, Black Liquor; LFG, Landfill Gas; MSW, Municipal Solid Waste; SUN, Solar Photovoltaic; WAT, Hydroelectric; WDS, Wood and Waste Solids; WND, Wind.

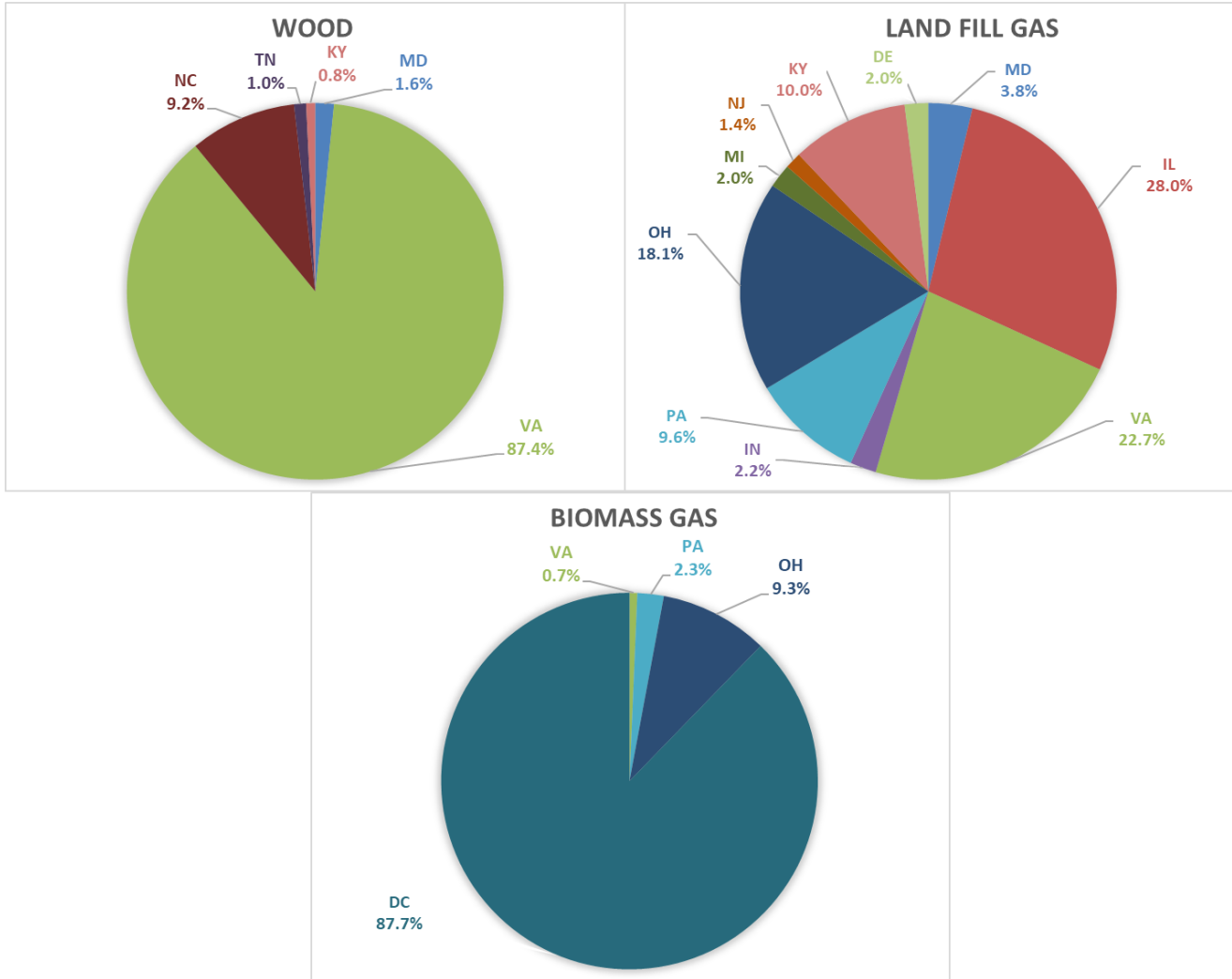
In 2022, all the RECs retired from geothermal and solar sources originated in Maryland. The seven remaining fuels used to comply with Maryland’s 2022 RPS requirements corresponded to RECs generated in multiple other states, and Figure 6 shows the percentage contribution from each state for each of these seven fuels. Facilities located in Maryland provided 52.5 percent of municipal solid waste RECs retired for compliance in 2022. Maryland resources provided only 1.3 percent of wind RECs, 2.2 percent of hydroelectric RECs, 4.0 percent of landfill gas RECs, and 1.6 percent of wood and waste solids RECs. Maryland produced no RECs from black liquor or biomass gas.

<sup>23</sup> Senate Bill 65 of 2021 (Chapter 673) removed black liquor as an eligible resource. However, this law stated that a presently existing obligation or contract right may not be impaired in any way by this Act; so black liquor RECs will remain eligible until certain still existing contracts expire.

**Figure 6 Percentage of RECs Generated in Each State, by Fuel (2022)**<sup>24</sup>



<sup>24</sup> Additional information pertaining to the source of renewable energy used to meet Maryland’s 2022 RPS compliance requirements is presented in Appendices A and B. Appendix A provides a breakdown of the *number of RECs* used by electricity suppliers according to tier, fuel type, and facility location, while Appendix B presents the *number of facilities* by tier, fuel type, and facility location that provided RECs for compliance.



### III. MARYLAND RENEWABLE ENERGY FACILITIES

Implementation of the Maryland RPS Program can provide an incentive for renewable generators to locate in Maryland and generate electricity. The renewable requirement establishes a market for renewable energy, and, to the extent Maryland’s geography and natural resources can be utilized to generate renewable electricity, developers may locate projects within the state. This section of the report provides information about the REFs located in Maryland in 2022.<sup>25</sup> Renewable energy generated in Maryland can be used both in Maryland and in other states for RPS compliance purposes, and also can be sold in support of competitive retail electricity supplier product offerings (*i.e.*, green power products).<sup>26</sup> Green power products are generally

<sup>25</sup> Specific information pertaining to the State’s REFs as described herein was made available by PJM-EIS in the GATS State Agency Report.

<sup>26</sup> Facilities located in Maryland are not necessarily registered by the Commission for the Maryland RPS; rather, certain facilities may seek certification out-of-state in support of a long-term contract for the RECs from an out-of-state counterparty. Counterparties can include an electricity supplier operating in a different state and purchasing the

offered to the public with higher concentrations of electricity generated by renewable energy resources (e.g., 50 or 100 percent) than required by Maryland’s RPS.

As shown in Table 9, in 2022, eligible sources located within Maryland generated approximately 1.2 million Tier 1 non-solar RECs, 1.8 million Tier 1 SRECs, and 1.8 million Tier 2 RECs. Additional analyses pertaining to the Maryland-based renewable generators is presented in Appendices C through E. Appendix C shows the disposition of RECs generated in Maryland in 2022. Appendix D provides the number of renewable energy facilities by county that are both located in Maryland and registered with GATS to participate in any one of the PJM states’ RPS programs. Appendix E provides the total capacity of these facilities, broken out by county and tier.

**Table 9 2022 Maryland-Generated RECs by Fuel Source**

<b>Fuel Type</b>		<b>RECs (Quantity)</b>	<b>RECs (Percent)</b>
<b>Tier 1</b>	Geothermal	30,113	0.6%
	Landfill Gas	63,606	1.3%
	Municipal Solid Waste	590,886	12.5%
	Small Hydro	19,710	0.4%
	Wood Waste	11,972	0.3%
	Wind	503,587	10.6%
<b>Tier 1 Solar</b>	Solar PV	1,761,424	37.2%
	Solar Thermal	2,671	0.1%
<b>Tier 2</b>	Large Hydro	1,756,123	37.0%
<b>Total</b>		<b>4,740,092</b>	<b>100.0%</b>

Table 10 presents additional detail regarding the disposition of Maryland-generated RECs in calendar year 2022. Approximately 17 percent of the RECs generated by renewable facilities located within Maryland during 2022 are available for potential future sale in Maryland or in other states in subsequent compliance years. Almost 63 percent of all RECs generated in Maryland were retired in 2022 to meet the RPS requirements in Maryland and various other PJM states. Labeled as “Other” in Table 10, 20.6 percent of RECs were used for other purposes, which may include pending transfers between parties.

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RECs to satisfy the RPS requirement for another state or other entities, such as brokers, that purchase the REC output for resale.

**Table 10 Disposition of 2022 Maryland-Generated RECs**

REC Tier	Available	RPS Compliance	Other	Total
Tier 1 Non-Solar	546,164	673,401	309	1,219,874
Tier 1 Solar	183,074	1,575,128	5,893	1,764,095
Tier 2	66,030	721,132	968,961	1,756,123
<b>Total</b>	<b>795,268</b>	<b>2,969,661</b>	<b>975,163</b>	<b>4,740,092</b>
(%)	<b>16.8%</b>	<b>62.6%</b>	<b>20.6%</b>	<b>100.0%</b>

Source: PJM-EIS

Table 11 presents, on a state-by-state basis, the distribution of the RECs both generated in-state and retired for RPS compliance purposes. In 2022, Maryland-generated RECs were retired for compliance purposes in five jurisdictions: the District of Columbia, Delaware, Maryland, New Jersey, and Pennsylvania.

**Table 11 2022 Maryland-Generated RECs Retired for RPS Compliance by State**

Tier	Fuel Type	DC	DE	MD	NJ	PA	VA	Total
<b>Tier 1</b>	Geothermal	-	-	20,780	-	-	26	20,806
	Land Fill Gas	-	-	8,624	10,614	9,921	-	29,159
	Mun. Solid Waste	-	-	301,900	-	-	65,000	366,900
	Small Hydro	-	-	19,306	-	-	-	19,306
	Wood Waste	-	-	11,029	-	-	-	11,029
	Wind	-	96,556	50,763	61,900	16,982	-	226,201
	<b>Subtotal</b>	-	<b>96,556</b>	<b>412,402</b>	<b>72,514</b>	<b>26,903</b>	<b>65,026</b>	<b>673,401</b>
	<b>Percentage</b>	<b>0.0%</b>	<b>14.3%</b>	<b>61.2%</b>	<b>10.8%</b>	<b>4.0%</b>	<b>9.7%</b>	<b>100.0%</b>
<b>Tier 1 Solar</b>	Solar PV	5,120	-	1,572,808	-	7	-	1,577,935
	Solar Thermal	-	-	2,313	-	-	-	2,313
	<b>Subtotal</b>	<b>5,120</b>	-	<b>1,575,121</b>	-	<b>7</b>	-	<b>1,580,248</b>
	<b>Percentage</b>	<b>0.3%</b>	<b>0.0%</b>	<b>99.7%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>100.0%</b>
<b>Tier 2</b>	Large Hydro	-	-	20,000	-	-	701,132	20,000
	<b>Subtotal</b>	-	-	20,000	-	-	<b>701,132</b>	20,000
	<b>Percentage</b>	<b>0.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>97.2%</b>	<b>100.0%</b>
<b>All Tiers</b>	<b>2,493</b>	<b>5,120</b>	<b>96,556</b>	<b>2,007,523</b>	<b>72,514</b>	<b>26,910</b>	<b>766,158</b>	<b>2,974,781</b>
	<b>0.1%</b>	<b>0.2%</b>	<b>3.2%</b>	<b>67.5%</b>	<b>2.4%</b>	<b>0.9%</b>	<b>25.8%</b>	<b>100.0%</b>

Source: PJM-EIS.

#### IV. CONCLUSION

The electricity supplier compliance reports for 2022, verified by the Commission, indicate that most Maryland RPS obligations were met via the purchase and retirement of RECs, with \$86.6 million in ACPs. Approximately 19 percent of RECs used for compliance in 2022 came from in-state resources, largely unchanged from 2020. RECs derived from two fuel types—wind (49.6 percent), and black liquor (11.8 percent)—were the predominant sources of

Tier 1 compliance in 2022. The Tier 1 Solar carve-out was met by the retirement of RECs generated exclusively in Maryland. Companies demonstrated Tier 2 compliance by purchasing RECs derived from large hydroelectric sources. Throughout this next year, the Commission will continue to: review applications from facilities requesting certification as a Maryland REF, oversee the RPS Program, and verify that the electricity suppliers in Maryland procure enough electricity generated by renewable resources.



## **APPENDICES**

### Appendix A 2022 Retired RECs by Facility

Facility Name	State	Fuel	Quantity	BLQ %	Tier 1%
Covington Facility - MeadWestvaco Covington	VA	BLQ	480,532	26.1%	3.47%
Domtar Paper Co LLC Plymouth NC - TG 7-9-10	NC	BLQ	280,662	15.2%	2.03%
Franklin Mill - #6 R.B./#9T.G.	VA	BLQ	251,722	13.7%	1.82%
Hopewell Mill - Gen 1	VA	BLQ	191,488	10.4%	1.38%
Johnsonburg Mill - PT1	PA	BLQ	32,174	1.7%	0.23%
Kapstone Kraft Paper Corporation - Generator 1	NC	BLQ	167,895	9.1%	1.21%
Pixelle Specialty Solutions -Chillicothe - T10-T13	OH	BLQ	158,712	8.6%	1.15%
West Point Mill - GEN8-12	VA	BLQ	280,053	15.2%	2.02%
			<b>Total</b>	<b>1,843,238</b>	<b>100.00%</b>
					<b>13.31%</b>
Facility Name	State	Fuel	Quantity	LFG %	Tier 1%
ACE CUMBERLAND CTY 1 LF - 11	NJ	LFG	9,632	1.3%	0.07%
AEP CLOYDS MT 1 LF - 1	VA	LFG	7,351	1.0%	0.05%
AEP ELKHART 1 LF - 1	IN	LFG	9,859	1.3%	0.07%
AEP JAY COUNTY 1 LF - 1	IN	LFG	6,847	0.9%	0.05%
AEP ORCHARD HILLS 1 LF - 1	MI	LFG	15,204	2.0%	0.11%
AP UPTON DG 1 F - 1	PA	LFG	1,622	0.2%	0.01%
Archbald Power Station - GEN1	PA	LFG	12,294	1.6%	0.09%
Bavarian LFGTE - Bavarian	KY	LFG	20,460	2.7%	0.15%
BC MILLERSVILLE 1 LF - 1	MD	LFG	9,833	1.3%	0.07%
Biodyne Pontiac - 1	IL	LFG	57,302	7.7%	0.41%
Blue Ridge LFGTE - 1	PA	LFG	17,350	2.3%	0.13%
Blue Ridge LFGTE - Blue Ridge LFGTE	KY	LFG	4,672	0.6%	0.03%
Broad Mountain BTM - Parasitic Load	PA	LFG	5,184	0.7%	0.04%
CCIA BTM - 2	NJ	LFG	509	0.1%	0.00%
CID - LFG Turbines	IL	LFG	16,781	2.2%	0.12%
COM ORCHARD 1 LF - 1	IL	LFG	52,089	7.0%	0.38%
Croda Atlas Point CHP - Units 1 and 2	DE	LFG	5,992	0.8%	0.04%
DPL CENTRAL 1 LF - 1	DE	LFG	2,844	0.4%	0.02%
DPL NEWLAND PARK 1 LF - 1	MD	LFG	4,903	0.7%	0.04%
DPL SOUTHERN 1 LF - 1	DE	LFG	6,267	0.8%	0.05%
Eastern LFG BTM - 1	MD	LFG	5,014	0.7%	0.04%
Eastern LFG BTM - 2	MD	LFG	2,698	0.4%	0.02%
FE CARBON ALUM 1 LF - 1	OH	LFG	10,108	1.4%	0.07%
FE ERIE COUNTY 1 LF - 1	OH	LFG	9,114	1.2%	0.07%
FE GENEVA 1 LF - 1	OH	LFG	12,446	1.7%	0.09%
FE LORAIN 1 LF - 1	OH	LFG	50,589	6.8%	0.37%
FE MAHONING 1 LF - 1	OH	LFG	14,309	1.9%	0.10%

FE OTTAWA COUNTY 1 LF - 1	OH	LFG	1,686	0.2%	0.01%
Frey Farm Landfill - 1	PA	LFG	7,037	0.9%	0.05%
Green Valley LFGTE - Green Valley	KY	LFG	11,014	1.5%	0.08%
Greene Valley - Landfill Gas Turbines	IL	LFG	16,663	2.2%	0.12%
Hardin County LFGTE - Hardin County	KY	LFG	5,863	0.8%	0.04%
Lake Gas Recovery - Gas Turbines	IL	LFG	7,511	1.0%	0.05%
Lakeview Gas Recovery - 1	PA	LFG	2,645	0.4%	0.02%
Laurel Ridge LFGTE - Laurel Ridge	KY	LFG	6,512	0.9%	0.05%
Lorain County Power Station - Units 1-18	OH	LFG	36,755	4.9%	0.27%
Lycoming Landfill - 1	PA	LFG	12,206	1.6%	0.09%
ME NORTH LEBANON 1 F - 1	PA	LFG	2,749	0.4%	0.02%
Morehead Generating Facility - m3516	KY	LFG	14,661	2.0%	0.11%
PE SE CHESTER COUNTY REFUSE 1 LF - 1	PA	LFG	169	0.0%	0.00%
Pendleton County LFGTE - Pendleton County	KY	LFG	11,720	1.6%	0.08%
Pennsauken Landfill - Pennsauken Landfill	NJ	LFG	374	0.1%	0.00%
PEP OAKS 4 LF - 4	MD	LFG	4,218	0.6%	0.03%
PEP RITCHIE BROWN 2 LF - 2	MD	LFG	261	0.0%	0.00%
PEP RITCHIE BROWN 2 LF - GEN 2	MD	LFG	1,226	0.2%	0.01%
PEP RITCHIE PG COGEN 1 - GEN 2	MD	LFG	1	0.0%	0.00%
PL ARCHBALD PEI 5 LF - 5	PA	LFG	120	0.0%	0.00%
PL ARCHBALD PEI 6 LF - 6	PA	LFG	1,110	0.1%	0.01%
PL PINE GROVE 1 LF - 1	PA	LFG	7	0.0%	0.00%
PN NORTHERN TIER 1 D - 1	PA	LFG	127	0.0%	0.00%
PN SHIPPENSBURG 1 LF - 1	PA	LFG	953	0.1%	0.01%
Prairie View RDF Landfill Gas-to-Energy	IL	LFG	20,935	2.8%	0.15%
Rochelle Energy LLC - Rochelle Energy LLC	IL	LFG	10,348	1.4%	0.07%
Settlers Hill - LFG Turbines	IL	LFG	19,037	2.6%	0.14%
Suffolk Energy Partners, LLC - SU1, SU2	VA	LFG	507	0.1%	0.00%
Tullytown Landfill Gas-to-Energy Facility	PA	LFG	8,299	1.1%	0.06%
VP AMELIA 1 CT - 1	VA	LFG	9,615	1.3%	0.07%
VP BETHEL 1 LF - 1	VA	LFG	8,386	1.1%	0.06%
VP BRUNSWICK 1 LF - 1	VA	LFG	6,983	0.9%	0.05%
VP CHARLES CITY 1 CT - 1	VA	LFG	50,961	6.8%	0.37%
VP CHESTERFIELD 1 LF - 1	VA	LFG	23,274	3.1%	0.17%
VP HENRICO 1 LF - 1	VA	LFG	5,243	0.7%	0.04%
VP KING AND QUEEN 1 D - 1	VA	LFG	21,397	2.9%	0.15%
VP KING GEORGE 1 LF - 1	VA	LFG	27,228	3.6%	0.20%
VP OCCOQUAN 2 LF - 2	VA	LFG	4,250	0.6%	0.03%
VP PENINSULA 3 LF - 3	VA	LFG	3,330	0.4%	0.02%

VP VIRGINIA BEACH 1 LF - 1	VA	LFG	854	0.1%	0.01%
Woodland - LFG Engines	IL	LFG	8,512	1.1%	0.06%
		<b>Total</b>	<b>746,020</b>	<b>100.00%</b>	<b>5.39%</b>
<b>Facility Name</b>	<b>State</b>	<b>Fuel</b>	<b>Quantity</b>	<b>MSW %</b>	<b>Tier 1%</b>
Covanta Fairfax Energy - 1	VA	MSW	511,045	47.5%	3.69%
Montgomery County Resource Recovery - GEN1	MD	MSW	326,649	30.3%	2.36%
Montgomery County Resource Recovery - Gen 2	MD	MSW	55,584	5.2%	0.40%
Wheelabrator Baltimore Refuse - GEN1	MD	MSW	183,101	17.0%	1.32%
		<b>Total</b>	<b>1,076,379</b>	<b>100.00%</b>	<b>7.77%</b>
<b>Facility Name</b>	<b>State</b>	<b>Fuel</b>	<b>Quantity</b>	<b>OBG %</b>	<b>Tier 1%</b>
Allentown Wastewater Treatment Plant	PA	OBG	1,737	2.3%	0.01%
Atlantic Treatment Plant	VA	OBG	454	0.6%	0.00%
Buckeye BioGas - Wooster - OARDC	OH	OBG	2,622	3.4%	0.02%
DC Water Bailey Bioenergy Facility - GTG1	DC	OBG	25,892	33.7%	0.19%
DC Water Bailey Bioenergy Facility - GTG2	DC	OBG	14,733	19.2%	0.11%
DC Water Bailey Bioenergy Facility - GTG3	DC	OBG	26,801	34.9%	0.19%
Haviland Energy - Haviland	OH	OBG	4,267	5.6%	0.03%
Martinsville - IWPF 1	VA	OBG	58	0.1%	0.00%
Zanesville Energy - Zanesville 1	OH	OBG	280	0.4%	0.00%
		<b>Total</b>	<b>76,844</b>	<b>100.00%</b>	<b>0.55%</b>
<b>Facility Name</b>	<b>State</b>	<b>Fuel</b>	<b>Quantity</b>	<b>WAT %</b>	<b>Tier 1%</b>
AEP BUCK-BYLLESBY 1 H - 1	VA	WAT	85,713	6.2%	0.62%
AEP FRIES HYDRO - 1	VA	WAT	32,150	2.3%	0.23%
AEP GLEN FERRIS 1 H - 1	WV	WAT	19,225	1.4%	0.14%
Allegheny 5 - 1	PA	WAT	82,637	6.0%	0.60%
Allegheny Lock& Dam No 6 Hydro Project - 2	PA	WAT	63,663	4.6%	0.46%
Allegheny River Lock and Dam No. 8	PA	WAT	102,619	7.5%	0.74%
Allegheny River Lock and Dam No. 9	PA	WAT	115,663	8.4%	0.84%
AP MISC HYDRO H - 1	WV	WAT	26,926	2.0%	0.19%
Brasfield Hydroelectric Project Facility	VA	WAT	4,609	0.3%	0.03%
Banister Hydro, Inc - Halifax Hydroelectric	VA	WAT	748	0.1%	0.01%
Beaver Valley Patterson Dam - 1	PA	WAT	3,359	0.2%	0.02%
Berrien Springs - 1A	MI	WAT	21,891	1.6%	0.16%
Big Shoals Hydro - Unit # 1	VA	WAT	1,436	0.1%	0.01%
Buchanan - 1	MI	WAT	8,631	0.6%	0.06%
City of Radford Municipal Hydroelectric Project	VA	WAT	4,324	0.3%	0.03%
City of Rock Falls Upper Sterling Hydro	IL	WAT	7,286	0.5%	0.05%
Coleman Falls Hydro - Unit # 1	VA	WAT	10,328	0.8%	0.07%

Conemaugh Hydro Plant - GEN1	PA	WAT	47,449	3.5%	0.34%
Constantine - 1	MI	WAT	2,708	0.2%	0.02%
Cushaw - 1	VA	WAT	24,757	1.8%	0.18%
Deep Creek - 2	MD	WAT	3,399	0.2%	0.02%
Deep Creek - 32	MD	WAT	18,655	1.4%	0.13%
Dixon Hydroelectric Dam	IL	WAT	13,278	1.0%	0.10%
Elkhart - 1	IN	WAT	4,035	0.3%	0.03%
French Paper Co - Unit 1 - 4	MI	WAT	3,509	0.3%	0.03%
Great Falls Hydro Project - HY1	NJ	WAT	11,671	0.9%	0.08%
Holcomb Rock Hydro - Unit # 1	VA	WAT	12,799	0.9%	0.09%
KC Brighton - LLC	MD	WAT	1,193	0.1%	0.01%
Lockport Powerhouse Hydroelectric Facility	IL	WAT	29,199	2.1%	0.21%
London - 1	WV	WAT	54,416	4.0%	0.39%
Marmet - 1	WV	WAT	67,357	4.9%	0.49%
Moomaws Dam - Moomaws Dam	VA	WAT	1,924	0.1%	0.01%
Mother Ann Lee Hydroelectric Station	KY	WAT	3,111	0.2%	0.02%
Mottville - 1	MI	WAT	2,815	0.2%	0.02%
Niagara - 1	VA	WAT	10,994	0.8%	0.08%
Pinnacles Hydro Power Project - Units 1-3	VA	WAT	31,774	2.3%	0.23%
Ravenna Hydroelectric Project	KY	WAT	4,998	0.4%	0.04%
Reusens - 1	VA	WAT	24,768	1.8%	0.18%
Schoolfield Dam - Schoolfield	VA	WAT	16,901	1.2%	0.12%
Snowden Hydro Site - Unit # 1	VA	WAT	14,845	1.1%	0.11%
Swift Creek Hydro, Inc. - Lakeview Hydroelectric	VA	WAT	396	0.0%	0.00%
Twin Branch - 1	IN	WAT	17,256	1.3%	0.12%
Twin Cities Hydro LLC - Eligible - Units 1-4	MN	WAT	7,194	0.5%	0.05%
VP EMPORIA 1 H - 1	VA	WAT	3,184	0.2%	0.02%
Winfield - 1	WV	WAT	106,692	7.8%	0.77%
York Haven - 1	PA	WAT	186,648	13.6%	1.35%
Yough Hydro Power - 1	PA	WAT	52,759	3.8%	0.38%
		<b>Total</b>	<b>1,371,892</b>	<b>100.00%</b>	<b>9.91%</b>
<b>Facility Name</b>	<b>State</b>	<b>Fuel</b>	<b>Quantity</b>	<b>WDS %</b>	<b>Tier 1%</b>
AEP WEST KINGSPORT 1 LF - 1	TN	WDS	10,000	1.0%	0.07%
Covington Facility - MeadWestvaco Covington	VA	WDS	313,275	32.2%	2.26%
Cox Waste-to-Energy Cogeneration Plant	KY	WDS	7,574	0.8%	0.05%
Domtar Paper Co LLC Plymouth NC - TG 7-9-10	NC	WDS	63,439	6.5%	0.46%
Eastern Correctional Institution	MD	WDS	15,536	1.6%	0.11%
Hopewell Mill - Gen 1	VA	WDS	62,941	6.5%	0.45%
Kapstone Kraft Paper Corporation	NC	WDS	25,930	2.7%	0.19%
VP SOUTH BOSTON 1 F - 1	VA	WDS	410,052	42.1%	2.96%

West Point Mill - GEN8-12	VA	WDS	65,418	6.7%	0.47%
		<b>Total</b>	<b>974,165</b>	<b>100.00%</b>	<b>7.03%</b>
<b>Facility Name</b>	<b>State</b>	<b>Fuel</b>	<b>Quantity</b>	<b>WDS %</b>	<b>Tier 1%</b>
Blue Plains Wastewater Treatment Plant	DC	WH	4,100	90.0%	0.03%
DC Water Bailey Bioenergy Facility	DC	WH	296	6.5%	0.00%
HQO - Sharc Wastewater Thermal Facility	DC	WH	160	3.5%	0.00%
		<b>Total</b>	<b>4,556</b>	<b>100.00%</b>	<b>0.03%</b>
<b>Facility Name</b>	<b>State</b>	<b>Fuel</b>	<b>Quantity</b>	<b>WND %</b>	<b>Tier 1%</b>
AE ONTARIO WF - 1	NJ	WND	790	0.0%	0.01%
AEP BITTER RIDGE 1 WF - 1	IN	WND	17,482	0.2%	0.13%
AEP BLUE CREEK 3 WF - 3	OH	WND	133,979	1.7%	0.97%
AEP BLUFF POINT 2 WF - 2	IN	WND	29,941	0.4%	0.22%
AEP FOWLER RIDGE 1A WF - 1	IN	WND	21,672	0.3%	0.16%
AEP FOWLER RIDGE 1B WF - 2	IN	WND	35,578	0.5%	0.26%
AEP FOWLER RIDGE 2-2 WF - 22	IN	WND	71,722	0.9%	0.52%
AEP FOWLER RIDGE 3 WF - 3	IN	WND	27,552	0.4%	0.20%
AEP FOWLER RIDGE 4 WF - 4	IN	WND	50,626	0.7%	0.37%
AEP HEADWATERS 2 WF - 2	IN	WND	41,270	0.5%	0.30%
AEP HOG CREEK 1 WF - 1	OH	WND	215,551	2.8%	1.56%
AEP MEADOW LAKE 1 WF - 1	IN	WND	123,901	1.6%	0.89%
AEP MEADOW LAKE 2 WF - 2	IN	WND	81,369	1.1%	0.59%
AEP MEADOW LAKE 3 WF - 3	IN	WND	81,715	1.1%	0.59%
AEP MEADOW LAKE 4 WF - 4	IN	WND	73,842	1.0%	0.53%
AEP MEADOW LAKE 5 WF - 5	IN	WND	164,565	2.1%	1.19%
AEP MEADOW LAKE 6 WF - 6	IN	WND	223,946	2.9%	1.62%
AEP PAULDING 41 WF - 41	OH	WND	3,233	0.0%	0.02%
AEP PAULDING 42 WF - 42	OH	WND	4,532	0.1%	0.03%
AEP SCIOTO RIDGE 1 WF - 1	OH	WND	79,538	1.0%	0.57%
AEP TRISHE 1 WF - 1	OH	WND	28,268	0.4%	0.20%
AEP WILDCAT 1A WF - 1	IN	WND	72,312	0.9%	0.52%
AEP WILDCAT 1B WF - 2	IN	WND	116,277	1.5%	0.84%
AMP Wind Farm / OMEGA JV 6	OH	WND	958	0.0%	0.01%
AP BEECH RIDGE 1 WF - 1	WV	WND	22,753	0.3%	0.16%
AP BLACK ROCK 1 WF - 1	WV	WND	14,764	0.2%	0.11%
AP CRITERION 1 WF - 1	MD	WND	56,248	0.7%	0.41%
AP GREENLAND GAP 1 WF - 1	WV	WND	144,626	1.9%	1.04%
AP PINNACLE 1 WF - 1	WV	WND	183,053	2.4%	1.32%
AP ROTH ROCK 1 WF - 1	MD	WND	41,404	0.5%	0.30%
AP SOUTH CHESTNUT 1 WF - 1	PA	WND	66,138	0.9%	0.48%

AP TWIN RIDGES 1 WF - 1	PA	WND	43,110	0.6%	0.31%
Ball Metal Beverage Container - Zephyr Wind	OH	WND	11,122	0.1%	0.08%
Bishop Hill Wind Farm - 1	IL	WND	1,042,794	13.5%	7.53%
COM ADAM 1 WF - 1	IL	WND	5,101	0.1%	0.04%
COM BIG SKY 1 WF - 1	IL	WND	45,119	0.6%	0.33%
COM BLOOMING GROVE 1 WF1 - 1	IL	WND	150,521	1.9%	1.09%
COM BRIGHT STALK 1 WF - 1	IL	WND	104,203	1.3%	0.75%
COM CAMP GROVE 1 WF - 1	IL	WND	33,036	0.4%	0.24%
COM CAMP GROVE 2 WF - 2	IL	WND	27,993	0.4%	0.20%
COM CAYUGA RIDGE 1 WF - 1	IL	WND	143,355	1.9%	1.04%
COM ECO GROVE 1 WF - 1	IL	WND	19,021	0.2%	0.14%
COM GRAND RIDGE 1 WF - 1	IL	WND	47,624	0.6%	0.34%
COM GRAND RIDGE 2 WF - 2	IL	WND	20,197	0.3%	0.15%
COM GRAND RIDGE 3 WF - 3	IL	WND	15,445	0.2%	0.11%
COM GREEN RIVER 1 WF - 1	IL	WND	24,286	0.3%	0.18%
COM GREEN RIVER 2 WF - 2	IL	WND	41,687	0.5%	0.30%
COM HIGH TRAIL 1 WIND - 1	IL	WND	132,965	1.7%	0.96%
COM HILLTOPPER 1 WF - 1	IL	WND	238,338	3.1%	1.72%
COM KELLY CREEK 1 WF - 1	IL	WND	190,198	2.5%	1.37%
COM LONE TREE 3 WF - 3	IL	WND	24,584	0.3%	0.18%
COM MINONK 1 WF - 1	IL	WND	355,037	4.6%	2.56%
COM OLD TRAIL 2 WF - 2	IL	WND	356,170	4.6%	2.57%
COM OTTER CREEK 1 WF - 1	IL	WND	69,326	0.9%	0.50%
COM PROVIDENCE HGTS 1 WF - 2	IL	WND	5,796	0.1%	0.04%
COM RADFORDS RUN 1 WF - 1	IL	WND	854,408	11.0%	6.17%
COM SHADY OAKS 1 WF - 1	IL	WND	8,868	0.1%	0.06%
COM SUBLETTE 1 WF - 1	IL	WND	11,216	0.1%	0.08%
COM TOP CROP 1 WF - 1	IL	WND	32,712	0.4%	0.24%
COM TOP CROP 2 WF - 2	IL	WND	37,159	0.5%	0.27%
COM WALNUT RIDGE 1 WF - 1	IL	WND	248,253	3.2%	1.79%
COM WBROOK 1 WF - 1	IL	WND	33,766	0.4%	0.24%
COM WHITNEY HILL 2 WF - 2	IL	WND	38,596	0.5%	0.28%
Findlay Wind Farm - Findlay Wind Farm	OH	WND	8,045	0.1%	0.06%
Fowler Ridge II Wind Farm - Vectren - FR2	IN	WND	140,582	1.8%	1.02%
FPL E Somerset Windpower LLC - EW	PA	WND	4,069	0.1%	0.03%
Harpster Wind - Harpster Wind	OH	WND	3,513	0.0%	0.03%
Haviland Wind Farm - WTG A	OH	WND	5,830	0.1%	0.04%
Haviland Wind Farm - WTG B	OH	WND	5,352	0.1%	0.04%
Haviland Wind Farm - WTG C	OH	WND	4,002	0.1%	0.03%
Holcim-Paulding Wind Project	OH	WND	12,361	0.2%	0.09%
Jersey-Atlantic Wind, LLC - 1-5	NJ	WND	4,092	0.1%	0.03%

Mendota Hills LLC - 1	IL	WND	670	0.0%	0.00%	
Meyersdale Windpower - GE15	PA	WND	7,939	0.1%	0.06%	
Mill Run Windpower - g1	PA	WND	4,336	0.1%	0.03%	
PL LOCUST RIDGE 2 WF - 2	PA	WND	8,549	0.1%	0.06%	
PN ALLEGHENY RIDGE 1 WF - 1	PA	WND	70,677	0.9%	0.51%	
PN ARMENIA MOUNTAIN 1 WF - 1	PA	WND	64,942	0.8%	0.47%	
PN BIG LEVEL 1 WF - 1	PA	WND	1,998	0.0%	0.01%	
PN CASSELMAN 1 WF - 1	PA	WND	2,791	0.0%	0.02%	
PN HIGHLAND 1 WF - 1	PA	WND	181	0.0%	0.00%	
PN LAUREL HILLS 1 WF - 1	PA	WND	371	0.0%	0.00%	
PN LOOKOUT 1 WF - 1	PA	WND	93,950	1.2%	0.68%	
PN MEHOOPANY 1 WF - 1	PA	WND	98,724	1.3%	0.71%	
PN MEHOOPANY 2 WF - 2	PA	WND	83,080	1.1%	0.60%	
PN NORTH ALLEGHENY 2 WF - 2	PA	WND	49,659	0.6%	0.36%	
PN PATTON 1 WF - 1	PA	WND	5,799	0.1%	0.04%	
PN RINGER HILL 1 WF - 1	PA	WND	23,586	0.3%	0.17%	
PN SANDY RIDGE 1 WF - 1	PA	WND	39,538	0.5%	0.29%	
PN STONY CREEK 1 WF - 1	PA	WND	125,881	1.6%	0.91%	
Tatanka Wind Farm - 2 IMPORT	ND	WND	17,508	0.2%	0.13%	
Valfilm Wind Project - Valfilm Wind Project	OH	WND	7,886	0.1%	0.06%	
VP DESERT 1 WF - 1	NC	WND	1,314	0.0%	0.01%	
VP NEW CREEK 1 WF - 1	WV	WND	136,114	1.8%	0.98%	
Waymart Wind - GE15	PA	WND	22,786	0.3%	0.16%	
Whirlpool Corporation - Greenville Wind Farm	OH	WND	11,685	0.2%	0.08%	
Whirlpool Corporation - Ottawa Wind Farm	OH	WND	4,338	0.1%	0.03%	
Whirlpool Corporation-Marion Wind Farm	OH	WND	10,018	0.1%	0.07%	
Zephyr Wind - Zephyr Wind	OH	WND	11,609	0.2%	0.08%	
			<b>Total</b>	<b>7,735,386</b>	<b>100.00%</b>	<b>55.85%</b>
<b>Facility Name</b>						
AEP CALDERWOOD 1 H - 1	TN	WAT	162,707	27.6%	27.56%	
AEP CHEOAH 1 H - 1	NC	WAT	230,856	39.1%	39.11%	
AEP SUMMERSVILLE 1-2 H - 1	WV	WAT	542	0.1%	0.09%	
Belleville - 1	WV	WAT	13,191	2.2%	2.23%	
Cheoah - Eligible - 1	NC	WAT	5,000	0.8%	0.85%	
Chilhowee - Eligible - 1-3	TN	WAT	32,982	5.6%	5.59%	
Conowingo - 99	MD	WAT	20,000	3.4%	3.39%	
Covanta New Martinsville Energy - 1	WV	WAT	10,952	1.9%	1.86%	
Falls - IMPORT	NC	WAT	7,055	1.2%	1.20%	
High Rock - IMPORT	NC	WAT	7,665	1.3%	1.30%	
John H Kerr - 1	VA	WAT	2,500	0.4%	0.42%	



Narrows - IMPORT	NC	WAT	34,373	5.8%	5.82%
Safe Harbor - 8	PA	WAT	7,119	1.2%	1.21%
Santeetlah - Eligible - 1-2	NC	WAT	45,773	7.8%	7.75%
Tuckertown - IMPORT	NC	WAT	9,615	1.6%	1.63%
			<b>Total</b>	<b>590,330</b>	<b>100.00%</b>

Tier 1 REC Total	13,849,611
SREC Total	1,753,987
Tier 2 REC Total	590,330
<u>Grand Total</u>	<u>16,193,928</u>

\*Solar & Geothermal facilities are not represented in this table.

In 2022, 719 facilities produced 21,131 Geothermal RECs.

In 2022, 72,676 facilities produced 1,753,987 SRECs.

**Appendix B Location of Facilities that Provided RECs for 2022 RPS Compliance**

	DC	DE	IL	IN	KY	MD	MI	MN	NC	ND	NJ	OH	PA	TN	VA	WV	Total
<i><b>Tier 1 Non-solar</b></i>																	
Black Liquor	-	-	-	-	-	-	-	-	2	-	-	1	1	-	4	-	8
Geothermal	-	-	-	-	-	719	-	-	-	-	-	-	-	-	-	-	719
Landfill Gas	-	3	9	2	7	7	1	-	-	-	2	7	13	-	13	-	64
Municipal Solid Waste	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	3
Other Biomass Gas	1	-	-	-	-	-	-	-	-	-	-	3	1	-	2	-	7
Small Hydro	-	-	3	2	2	2	5	1	-	-	1	-	8	-	17	5	46
Waste Heat	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Wood Waste	-	-	-	-	1	1	-	-	1	-	-	-	-	1	1	-	5
Wind	-	-	29	14	-	2	-	-	1	1	1	16	20	-	-	5	89
<i><b>Tier 1 Solar</b></i>																	
Solar PV	-	-	-	-	-	75,532	-	-	-	-	-	-	-	-	-	-	75,532
Solar Thermal	-	-	-	-	-	732	-	-	-	-	-	-	-	-	-	-	732
<i><b>Tier 2</b></i>																	
Large Hydro	-	-	-	-	-	1	-	-	6	-	-	-	1	2	1	3	14
<b>Total</b>	4	3	41	18	10	76,998	6	1	10	1	4	27	44	3	39	13	77,222

Note: In order to prevent double counting, facilities using multiple fuels are only listed under their primary fuel.

### Appendix C Disposition of 2022 Vintage RECs Generated in Maryland

Fuel Type and Tier	RECs Retired for RPS Compliance by State							Available	Other	Total RECs Generated
	DC	DE	MD	NJ	PA	VA	Total			
Geothermal	-	-	20,780	-	-	26	20,806	9,307	-	30,113
Landfill Gas	-	-	8,624	10,614	9,921	-	29,159	34,447	-	63,606
Municipal Solid Waste	-	-	301,900	-	-	65,000	366,900	223,986	-	590,886
Small Hydro	-	-	19,306	-	-	-	19,306	404	-	19,710
Wind	-	96,556	50,763	61,900	16,982	-	226,201	277,077	309	503,587
Wood Waste	-	-	11,029	-	-	-	11,029	943	-	11,972
<b><i>Tier 1 Non-solar Total</i></b>	-	96,556	412,402	72,514	26,903	65,026	673,401	546,164	309	1,219,874
Solar PV	5,120	-	1,572,808	-	7	-	1,577,935	182,718	771	1,761,424
Solar Thermal	-	-	2,313	-	-	-	2,313	356	2	2,671
<b><i>Tier 1 Solar Total</i></b>	5,120	-	1,575,121	-	7	-	1,580,248	183,074	773	1,764,095
Large Hydro	-	-	20,000	-	-	701,132	721,132	66,030	968,961	1,756,123
<b><i>Tier 2 Total</i></b>	-	-	20,000	-	-	701,132	721,132	66,030	968,961	1,756,123
<b><i>Grand Total</i></b>	5,120	96,556	2,007,523	72,514	26,910	766,158	2,974,781	795,268	970,043	4,740,092

## Appendix D Number of Renewable Energy Facilities Located in Maryland

<b>Maryland County</b>	<b>Tier 1</b>	<b>Solar</b>	<b>Tier 2</b>	<b>Total</b>
Allegany	-	70	-	70
Anne Arundel	114	10,345	-	10,459
Baltimore	268	9,431	-	9,699
Baltimore City	8	1,404	-	1,412
Calvert	23	1,034	-	1,057
Caroline	-	414	-	414
Carroll	40	2,660	-	2,700
Cecil	34	1,946	-	1,980
Charles	13	3,413	-	3,426
Dorchester	2	415	-	417
Frederick	71	3,558	-	3,629
Garrett	6	74	-	80
Harford	191	4,704	1	4,896
Howard	136	4,991	-	5,127
Kent	4	399	-	403
Montgomery	98	14,448	-	14,546
Prince George's	24	22,958	-	22,982
Queen Anne's	6	822	-	828
Somerset	1	337	-	338
St. Mary's	10	1,807	-	1,817
Talbot	5	300	-	305
Washington	47	1,298	-	1,345
Wicomico	4	1,355	-	1,359
Worcester	2	621	-	623
<b>Total</b>	<b>1,107</b>	<b>88,804</b>	<b>1</b>	<b>89,912</b>

Note: This list includes all renewable generators that are both: 1) located within Maryland, and 2) registered to participate in any one of the PJM states' renewable energy programs as of October 1, 2023.

**Appendix E Capacity of Renewable Energy Facilities Located in Maryland (MW)**

<b>Maryland County</b>	<b>Tier 1 Non-Solar</b>	<b>Tier 1 Solar</b>	<b>Tier 2</b>	<b>Total</b>
Allegany	-	5.7	-	5.7
Anne Arundel	6.5	160.6	-	167.1
Baltimore	77.9	152.6	-	230.4
Baltimore City	0.6	28.1	-	28.6
Calvert	1.0	13.1	-	14.1
Caroline	-	14.3	-	14.3
Carroll	1.4	70.5	-	71.9
Cecil	1.2	43.2	-	44.4
Charles	0.5	53.7	-	54.2
Dorchester	0.0	18.8	-	18.8
Frederick	2.2	101.8	-	104.0
Garrett	210.0	12.8	-	222.8
Harford	6.9	82.5	474.0	563.4
Howard	6.0	116.4	-	122.4
Kent	0.1	22.5	-	22.7
Montgomery	81.8	176.9	-	258.7
Prince George's	14.1	299.2	-	313.3
Queen Anne's	0.2	146.5	-	146.7
Somerset	3.8	153.8	-	157.6
St. Mary's	0.4	20.2	-	20.6
Talbot	70.4	14.7	-	85.1
Washington	1.4	96.8	-	98.2
Wicomico	13.4	50.6	-	64.0
Worcester	7.3	25.4	-	32.7
<b>Total</b>	<b>507.1</b>	<b>1,880.5</b>	<b>474.0</b>	<b>2,861.6</b>

Note: This list includes all renewable generators that are both: 1) located within Maryland, and 2) registered to participate in any one of the PJM states' renewable energy programs as of October 1, 2023.

## Appendix F Maryland Certified Renewable Energy Facilities<sup>27</sup>

Plant Name	Date Online	State	Certification Number
Blue Plains Wastewater Treatment Plant	10/1/2014	DC	MD-20222-WH-01
DC Water Bailey Bioenergy Facility	10/1/2014	DC	MD-40189-OBG-01
DC Water Bailey Bioenergy Facility	1/1/2016	DC	MD-20225-WH-01
DC Water Bailey Bioenergy Facility	1/1/2016	DC	MD-20224-WH-01
DC Water Bailey Bioenergy Facility	1/1/2016	DC	MD-20226-WH-01
DC Water Bailey Bioenergy Facility	1/1/2016	DC	MD-20223-WH-01
HQO	1/1/2019	DC	MD-20221-WH-01
Croda Atlas Point CHP	8/1/2013	DE	MD-40191-LFG-01
DPL CENTRAL 1 LF	12/1/2006	DE	MD-40113-LFG-01
DPL SOUTHERN 1 LF	10/1/2006	DE	MD-40114-LFG-01
Edge Moor	12/1/1954	DE	MD-40103-LFG-01
Edge Moor	4/1/1966	DE	MD-40104-LFG-01
Edge Moor	8/1/1973	DE	MD-40105-LFG-01
Beecher	6/1/2006	IL	MD-40138-LFG-01
Biodyne Pontiac	12/1/1999	IL	MD-40199-LFG-01
CID	3/1/1989	IL	MD-40116-LFG-01
City of Rock Falls Upper Sterling Hydro	6/1/1998	IL	MD-90196-WAT-01
COM ADAM 1 WF	10/1/2007	IL	MD-20160-WND-01
COM BIG SKY 1 WF	8/1/2010	IL	MD-20143-WND-01
COM BISHOP HILL 1 WF	2/1/2012	IL	MD-20159-WND-01
COM BISHOP HILL 2 WF	2/1/2012	IL	MD-20159-WND-01
COM BLOOMING GROVE 1 WF1	10/1/2020	IL	MD-20212-WND-01
COM BRIGHT STALK 1 WF	12/1/2019	IL	MD-20202-WND-01
COM CAMP GROVE 1 WF	12/1/2007	IL	MD-20140-WND-01
COM CAMP GROVE 2 WF	12/1/2007	IL	MD-20140-WND-01
COM CAYUGA RIDGE 1 WF	12/1/2009	IL	MD-20117-WND-01
COM ECO GROVE 1 WF	6/1/2009	IL	MD-20127-WND-01
COM GRAND RIDGE 1 WF	10/1/2008	IL	MD-20144-WND-01
COM GRAND RIDGE 2 WF	12/1/2009	IL	MD-20118-WND-01
COM GRAND RIDGE 3 WF	11/1/2009	IL	MD-20119-WND-01
COM GRAND RIDGE 4 WF	12/1/2009	IL	MD-20152-WND-01
COM GREEN RIVER 1 WF	11/1/2019	IL	MD-20200-WND-01
COM GREEN RIVER 2 WF	11/1/2019	IL	MD-20201-WND-01
COM HIGH TRAIL 1 WIND	3/1/2007	IL	MD-20107-WND-01

<sup>27</sup> This list excludes solar facilities, none of which was installed prior to 1998. Also excluded is geothermal, none of which was installed prior to 2013. A full list of facilities can be found here: <https://gats.pjm-eis.com/gats2/PublicReports/RenewableGeneratorsRegisteredinGATS>.

COM HILLTOPPER 1 WF	11/1/2018	IL	MD-20188-WND-01
COM KELLY CREEK 1 WF	11/1/2016	IL	MD-20176-WND-01
COM LONE TREE 3 WF	11/1/2020	IL	MD-20214-WND-01
COM MINONK 1 WF	10/1/2012	IL	MD-20156-WND-01
COM OLD TRAIL 2 WF	1/1/2008	IL	MD-20108-WND-01
COM OTTER CREEK 1 WF	1/1/2020	IL	MD-20207-WND-01
COM PILOT HILL 1 WF	7/1/2015	IL	MD-20164-WND-01
COM PROVIDENCE HGTS 1 WF	6/1/2008	IL	MD-20155-WND-01
COM RADFORDS RUN 1 WF	10/1/2017	IL	MD-20184-WND-01
COM SHADY OAKS 1 WF	5/1/2012	IL	MD-20218-WND-01
COM SUBLETTE 1 WF	4/1/2007	IL	MD-20145-WND-01
COM TOP CROP 1 WF	10/1/2009	IL	MD-20125-WND-01
COM TOP CROP 2 WF	7/1/2010	IL	MD-20126-WND-01
COM WALNUT RIDGE 1 WF	10/1/2018	IL	MD-20196-WND-01
COM WBROOK 1 WF	4/1/2007	IL	MD-20145-WND-01
COM WHITNEY HILL 2 WF	12/1/2019	IL	MD-20194-WND-01
Crescent Ridge	5/1/2005	IL	MD-20153-WND-01
Dixon Hydroelectric Dam	1/1/1988	IL	MD-90195-WAT-01
Greene Valley	5/1/1996	IL	MD-40102-LFG-01
Lake Gas Recovery	8/1/1988	IL	MD-40101-LFG-01
Lockport Powerhouse Hydroelectric Facility	2/1/1999	IL	MD-90241-WAT-01
Mendota Hills LLC	3/1/2019	IL	MD-20100-WND-01
Rochelle Energy LLC	12/1/2011	IL	MD-40175-LFG-01
Settlers Hill	10/1/1988	IL	MD-40119-LFG-01
Woodland	5/1/1992	IL	MD-40121-LFG-01
AEP BITTER RIDGE 1 WF	9/1/2020	IN	MD-20208-WND-01
AEP BLUFF POINT 2 WF	9/1/2017	IN	MD-20182-WND-01
AEP ELKHART 1 LF	10/1/2010	IN	MD-40206-LFG-01
AEP FOWLER RIDGE 1A WF	2/1/2009	IN	MD-20112-WND-01
AEP FOWLER RIDGE 1B WF	2/1/2009	IN	MD-20112-WND-01
AEP FOWLER RIDGE 2-1 WF	12/1/2009	IN	MD-20138-WND-01
AEP FOWLER RIDGE 2-2 WF	12/1/2009	IN	MD-20138-WND-01
AEP FOWLER RIDGE 2-3 WF	12/1/2009	IN	MD-20138-WND-01
AEP FOWLER RIDGE 3 WF	2/1/2009	IN	MD-20139-WND-01
AEP FOWLER RIDGE 4 WF	12/1/2015	IN	MD-20172-WND-01
AEP HEADWATERS 1 WF	10/1/2014	IN	MD-20163-WND-01
AEP HEADWATERS 2 WF	1/1/2021	IN	MD-20216-WND-01
AEP JAY COUNTY 1 LF	4/1/2005	IN	MD-40205-LFG-01
AEP MEADOW LAKE 1 WF	10/1/2009	IN	MD-20131-WND-01
AEP MEADOW LAKE 2 WF	6/1/2010	IN	MD-20132-WND-01
AEP MEADOW LAKE 3 WF	8/1/2010	IN	MD-20133-WND-01

AEP MEADOW LAKE 4 WF	10/1/2010	IN	MD-20134-WND-01
AEP MEADOW LAKE 5 WF	7/1/2017	IN	MD-20181-WND-01
AEP MEADOW LAKE 6 WF	11/1/2018	IN	MD-20193-WND-01
AEP WILDCAT 1A WF	10/1/2012	IN	MD-20158-WND-01
AEP WILDCAT 1B WF	10/1/2012	IN	MD-20158-WND-01
Elkhart	1/1/1913	IN	MD-90230-WAT-01
Fowler Ridge II Wind Farm - Vectren	12/1/2009	IN	MD-20138-WND-01
Twin Branch	5/1/1989	IN	MD-90228-WAT-01
Bavarian LFGTE	9/1/2003	KY	MD-40176-LFG-01
Blue Ridge LFGTE	11/1/2013	KY	MD-40204-LFG-01
Cox Waste-to-Energy Cogeneration Plant	1/1/2001	KY	MD-30114-WDS-01
DEOK MELDAHL DAM 1 H	8/1/2014	KY	MD-90259-WAT-02
Green Valley LFGTE	9/1/2003	KY	MD-40181-LFG-01
Hardin County LFGTE	1/1/2006	KY	MD-40178-LFG-01
Laurel Ridge LFGTE	9/1/2003	KY	MD-40180-LFG-01
Morehead Generating Facility	6/1/2019	KY	MD-40203-LFG-01
Mother Ann Lee Hydroelectric Station	3/1/2007	KY	MD-90219-WAT-01
Pendleton County LFGTE	2/1/2007	KY	MD-40177-LFG-01
Ravenna Hydroelectric Project	4/1/2021	KY	MD-90252-WAT-01
AP CRITERION 1 WF	12/1/2010	MD	MD-20124-WND-01
AP FAIR WIND 2 WF	11/1/2015	MD	MD-20170-WND-01
AP FOURMILE RIDGE 1 WF	12/1/2014	MD	MD-20167-WND-01
AP ROTH ROCK 1 WF	11/1/2010	MD	MD-20122-WND-01
BC ALPHA RIDGE 1 LF	7/1/2012	MD	MD-40171-LFG-01
BC MILLERSVILLE 1 LF	6/1/2012	MD	MD-40168-LFG-01
BWWTP Co-Gen Plant	11/1/2008	MD	MD-40140-LFG-01
Conowingo	3/1/1928	MD	MD-90176-WAT-02
Deep Creek	7/1/1925	MD	MD-90104-WAT-01
DPL NEWLAND PARK 1 LF	5/1/2007	MD	MD-40167-LFG-01
Eastern Correctional Institution	8/1/1987	MD	MD-30117-WDS-01
Eastern LFG BTM	6/1/2020	MD	MD-40209-LFG-01
Eastern LFG BTM	2/1/2021	MD	MD-402010-LFG-01
Easton	11/1/2004	MD	MD-50001-OBL-01
Easton Utilities - Landfill Gas Facility	1/1/2017	MD	MD-40202-LFG-01
KC Brighton	7/1/1985	MD	MD-90218-WAT-01
Montgomery County Resource Recovery Facility	5/1/1995	MD	MD-80001-MSW-01
Montgomery County Resource Recovery Facility	7/1/1995	MD	MD-80001-MSW-01
PEP RITCHIE BROWN 2 LF	12/1/2003	MD	MD-40137-LFG-01
PEP RITCHIE PG COGEN 1	10/1/1987	MD	MD-40136-LFG-01
Pocomoke Drying Plant	3/1/2007	MD	MD-50508-OBS-01



Salisbury Drying Plant	9/1/2020	MD	MD-50507-OBS-01
Talbot County Bio-Mass Facility	4/1/2011	MD	MD-20130-WND-01
Wheelabrator Baltimore Refuse	5/1/1985	MD	MD-80101-MSW-01
AEP ORCHARD HILLS 1 LF	1/1/2013	MI	MD-40201-LFG-01
Berrien Springs	1/1/1996	MI	MD-90229-WAT-01
Buchanan	1/1/1919	MI	MD-90226-WAT-01
Constantine	1/1/1923	MI	MD-90255-WAT-01
French Paper Co	2/1/2000	MI	MD-90221-WAT-01
Mottville	1/1/1923	MI	MD-90227-WAT-01
Twin Cities Hydro LLC	10/1/1924	MN	MD-90253-WAT-01
XIC FARMER CITY 1 WF	2/1/2009	MO	MD-20171-WND-01
Domtar Paper Co LLC Plymouth NC	9/1/1952	NC	MD-301180-BLQ-01; MD-30118-WDS-01
Falls	12/1/1919	NC	MD-90236-WAT-02
Gaston	2/1/1963	NC	MD-90231-WAT-02
High Rock	12/1/1927	NC	MD-90237-WAT-02
Kapstone Kraft Paper Corporation	1/1/1999	NC	MD-30116-AB-01; MD-30116-BLQ-01; MD-30116-WDS-01
Narrows	12/1/1917	NC	MD-90238-WAT-02
Roanoke Rapids	9/1/1955	NC	MD-90232-WAT-02
Tuckertown	12/1/1962	NC	MD-90239-WAT-02
VP DESERT 1 WF	11/1/2016	NC	MD-20178-WND-01
Tatanka Wind Farm	1/1/2008	ND	MD-20169-WND-01
ACE CUMBERLAND CTY 1 LF	11/1/2008	NJ	MD-40139-LFG-01
AE ONTARIO WF	12/1/2005	NJ	MD-20166-WND-01
CCIA BTM	10/1/2008	NJ	MD-40139-LFG-01
Great Falls Hydro Project	9/1/1984	NJ	MD-90215-WAT-01
JC OCEAN CTY 1 LF	5/1/2007	NJ	MD-40207-LFG-01
Jersey-Atlantic Wind, LLC	12/1/2005	NJ	MD-20166-WND-01
O'brien Edgeboro	9/1/1997	NJ	MD-40172-LFG-01
Ocean County Landfill	2/1/1997	NJ	MD-40208-LFG-01
Pennsauken Landfill	1/1/2005	NJ	MD-40148-LFG-01
PS PENNSAUKEN 1 LF	12/1/2004	NJ	MD-40148-LFG-01
AEP BLUE CREEK 3 WF	10/1/2011	OH	MD-20141-WND-01
AEP HOG CREEK 1 WF	12/1/2017	OH	MD-20186-WND-01
AEP PAULDING 3 WF	11/1/2016	OH	MD-20177-WND-01
AEP PAULDING 41 WF	1/1/2020	OH	MD-20215-WND-01
AEP PAULDING 42 WF	3/1/2020	OH	MD-20215-WND-01
AEP SCIOTO RIDGE 1 WF	10/1/2020	OH	MD-20213-WND-01
AEP TRISHE 1 WF	8/1/2018	OH	MD-20189-WND-01

AMP Wind Farm / OMEGA JV 6	12/1/2004	OH	MD-20183-WND-01
Ball Metal Beverage Container Corp.	8/1/2020	OH	MD-20209-WND-01
Buckeye BioGas	4/1/2010	OH	MD-50500-OBG-01
FE ERIE COUNTY 1 LF	4/1/2010	OH	MD-40174-LFG-01
FE GENEVA 1 LF	7/1/2013	OH	MD-40185-LFG-01
FE LORAIN 1 LF	12/1/2001	OH	MD-40187-LFG-01
FE MAHONING 1 LF	1/1/2013	OH	MD-40186-LFG-01
Findlay Wind Farm	12/1/2015	OH	MD-20175-WND-01
Harpster Wind	1/1/2016	OH	MD-20173-WND-01
Haviland Energy	4/1/2012	OH	MD-50503-OBG-01
Haviland Wind Farm	12/1/2012	OH	MD-20161-WND-01
Holcim-Paulding Wind Project	8/1/2020	OH	MD-20210-WND-01
Lorain County Power Station	12/1/2001	OH	MD-40188-LFG-01
Pixelle Specialty Solutions -Chillicothe	7/1/1978	OH	MD-30102-BLQ-01
Racine	1/1/1983	OH	MD-90217-WAT-02
Valfilm Wind Project	9/1/2018	OH	MD-20191-WND-01
Whirlpool Corporation - Greenville Wind Farm	10/1/2018	OH	MD-20192-WND-01
Whirlpool Corporation - Ottawa Wind Farm	1/1/2018	OH	MD-20187-WND-01
Whirlpool Corporation-Marion Wind Farm	10/1/2017	OH	MD-20185-WND-01
Zanesville Energy	10/1/2010	OH	MD-50502-OBG-01
Zephyr Wind	12/1/2015	OH	MD-20174-WND-01
Allegheny 5	10/1/1988	PA	MD-90180-WAT-01
Allegheny Lock& Dam No 6 Hydro Project	1/1/1989	PA	MD-90181-WAT-01
Allegheny River Lock and Dam No. 8	11/1/1990	PA	MD-90799-WAT-01
Allegheny River Lock and Dam No. 9	11/1/1990	PA	MD-90798-WAT-01
Allentown Wastewater Treatment Plant	7/1/2014	PA	MD-40187-OBG-01
AP ARDEN 1 LF	1/1/2009	PA	MD-40145-LFG-01
AP SOUTH CHESTNUT 1 WF	11/1/2011	PA	MD-20142-WND-01
AP TWIN RIDGES 1 WF	9/1/2012	PA	MD-20149-WND-01
AP UPTON DG 1 F	11/1/2004	PA	MD-40163-LFG-01
Archbald Power Station	9/1/1988	PA	MD-40115-LFG-01
Beaver Valley Patterson Dam	9/1/1982	PA	MD-90256-WAT-01
Blue Ridge LFGTE	11/1/2012	PA	MD-40173-LFG-01
Broad Mountain BTM	1/1/2009	PA	MD-40150-LFG-01
Conemaugh Hydro Plant	4/1/1989	PA	MD-90182-WAT-01
FPL E Somerset Windpower LLC	10/1/2001	PA	MD-20205-WND-01
Frey Farm Landfill	1/1/2006	PA	MD-40141-LFG-01
Johnsonburg Mill	2/1/1993	PA	MD-30133-BLQ-01
Lake Lynn Power Station	5/1/1926	PA	MD-90101-WAT-02
Lakeview Gas Recovery	6/1/1997	PA	MD-40125-LFG-01
Lycoming Landfill	8/1/2012	PA	MD-40183-LFG-01

ME NORTH LEBANON 1 F	9/1/2007	PA	MD-40142-LFG-01
Meyersdale Windpower	12/1/2003	PA	MD-20105-WND-01
Mill Run Windpower	10/1/2001	PA	MD-20204-WND-01
PE SE CHESTER COUNTY REFUSE 1 LF	1/1/2007	PA	MD-40135-LFG-01
Piney	6/1/1924	PA	MD-90103-WAT-02
Pixelle Specialty Solutions - Spring Grove	10/1/1989	PA	MD-30109-BLQ-01
PL ARCHBALD PEI 5 LF	1/1/2010	PA	MD-40115-LFG-01
PL ARCHBALD PEI 6 LF	1/1/2010	PA	MD-40115-LFG-01
PL LOCUST RIDGE 2 WF	11/1/2008	PA	MD-20115-WND-01
PL PINE GROVE 1 LF	8/1/2008	PA	MD-40165-LFG-01
PN ALLEGHENY RIDGE 1 WF	6/1/2007	PA	MD-20106-WND-01
PN ARMENIA MOUNTAIN 1 WF	11/1/2009	PA	MD-20114-WND-01
PN BIG LEVEL 1 WF	11/1/2019	PA	MD-20195-WND-01
PN CASSELMAN 1 WF	12/1/2007	PA	MD-20123-WND-01
PN HIGHLAND 1 WF	6/1/2009	PA	MD-20211-WND-01
PN HIGHLAND NORTH 2 WF	2/1/2012	PA	MD-20146-WND-01
PN LAUREL HILLS 1 WF	9/1/2012	PA	MD-20154-WND-01
PN LOOKOUT 1 WF	10/1/2008	PA	MD-20151-WND-01
PN MEHOOPANY 1 WF	12/1/2012	PA	MD-20148-WND-01
PN MEHOOPANY 2 WF	12/1/2012	PA	MD-20148-WND-01
PN NORTH ALLEGHENY 2 WF	9/1/2009	PA	MD-20190-WND-01
PN NORTHERN TIER 1 D	1/1/2009	PA	MD-40144-LFG-01
PN PATTON 1 WF	11/1/2012	PA	MD-20150-WND-01
PN RINGER HILL 1 WF	12/1/2016	PA	MD-20180-WND-01
PN SANDY RIDGE 1 WF	3/1/2012	PA	MD-20157-WND-01
PN SHIPPENSBURG 1 LF	1/1/2009	PA	MD-40143-LFG-01
PN STONY CREEK 1 WF	11/1/2009	PA	MD-20120-WND-01
Safe Harbor	10/1/1940	PA	MD-90100-WAT-02
Safe Harbor	11/1/1934	PA	MD-90100-WAT-02
Safe Harbor	12/1/1931	PA	MD-90100-WAT-02
Safe Harbor	12/1/1931	PA	MD-90100-WAT-02
Safe Harbor	1/1/1932	PA	MD-90100-WAT-02
Safe Harbor	1/1/1932	PA	MD-90100-WAT-02
Safe Harbor	10/1/1933	PA	MD-90100-WAT-02
Safe Harbor	4/1/1985	PA	MD-90100-WAT-02
Safe Harbor	2/1/1986	PA	MD-90100-WAT-02
Safe Harbor	6/1/1985	PA	MD-90100-WAT-02
Safe Harbor	4/1/1986	PA	MD-90100-WAT-02
Safe Harbor	9/1/1985	PA	MD-90100-WAT-02
Tullytown Landfill Gas-to-Energy Facility	3/1/2013	PA	MD-40184-LFG-01
Waymart Wind	10/1/2003	PA	MD-20206-WND-01

York Haven	12/1/1905	PA	MD-90240-WAT-01
Yough Hydro Power	12/1/1989	PA	MD-90242-WAT-01
Buzzards Roost Hydro	1/1/1940	SC	MD-90260-WAT-01
Lockhart Power Hydro	10/1/1921	SC	MD-90261-WAT-01
AEP BUCK-BYLLESBY 1 H	1/1/1912	VA	MD-90204-WAT-01
AEP CLOYDS MT 1 LF	12/1/2014	VA	MD-40197-LFG-01
AEP FRIES HYDRO	1/1/1933	VA	MD-90177-WAT-01
Appomattox River Associates, LP.	9/1/1992	VA	MD-90214-WAT-01
Atlantic Treatment Plant	5/1/2013	VA	MD-40203-OBG-01
Banister Hydro, Inc	1/1/1915	VA	MD-90212-WAT-01
Big Shoals Hydro	12/1/1925	VA	MD-90183-WAT-01
City of Radford Municipal Hydroelectric Project	8/1/1934	VA	MD-90249-WAT-01
Coleman Falls Hydro	6/1/1983	VA	MD-90184-WAT-01
Covanta Fairfax Energy	3/1/1990	VA	MD-80106-MSW-01
Covington Facility	1/1/1989	VA	MD-30010-BLQ-01; MD-30010-WDS-01
Cushaw	1/1/1930	VA	MD-90231-WAT-01
Franklin Mill	11/1/1977	VA	MD-30106-BLQ-01
Holcomb Rock Hydro	6/1/1920	VA	MD-90185-WAT-01
Hopewell Mill	12/1/1980	VA	MD-30101-BLQ-01; MD-30101-WDS-01
Hydro-FS	10/1/1946	VA	MD-90257-WAT-01
John H Kerr	12/1/1953	VA	MD-90250-WAT-02
Martinsville	4/1/2017	VA	MD-45000-OBG-01
Moomaws Dam	1/1/1984	VA	MD-90245-WAT-01
Niagara	6/1/1954	VA	MD-90202-WAT-01
Philpott Lake	8/1/1953	VA	MD-90251-WAT-01
Pinnacles Hydro Power Project	6/1/1938	VA	MD-90246-WAT-01
Reusens	1/1/1903	VA	MD-90244-WAT-01
Schoolfield Dam	12/1/1990	VA	MD-90193-WAT-01
Snowden Hydro Site	8/1/1987	VA	MD-90186-WAT-01
Suffolk Energy Partners, LLC	11/1/1994	VA	MD-40193-LFG-01
Swift Creek Hydro, Inc.	10/1/1988	VA	MD-90211-WAT-01
VP AMELIA 1 CT	8/1/2001	VA	MD-40157-LFG-01
VP BETHEL 1 LF	10/1/2007	VA	MD-40132-LFG-01
VP BRUNSWICK 1 LF	10/1/2007	VA	MD-40158-LFG-01
VP CHARLES CITY 1 CT	11/1/2003	VA	MD-40159-LFG-01
VP CHESTERFIELD 1 LF	6/1/2004	VA	MD-40160-LFG-01
VP EMPORIA 1 H	1/1/1986	VA	MD-90213-WAT-01
VP HENRICO 1 LF	9/1/2010	VA	MD-40161-LFG-01
VP KING AND QUEEN 1 D	1/1/2008	VA	MD-40162-LFG-01

VP KING GEORGE 1 LF	5/1/2010	VA	MD-40149-LFG-01
VP NORTHEAST 2 LF	12/1/2011	VA	MD-40154-LFG-01
VP OCCOQUAN 2 LF	3/1/1993	VA	MD-40107-LFG-01
VP PENINSULA 3 LF	9/1/2009	VA	MD-40146-LFG-01
VP SOUTH BOSTON 1 F	9/1/2013	VA	MD-30113-WDS-01
VP VIRGINIA BEACH 1 LF	11/1/2001	VA	MD-40166-LFG-01
West Point Mill	10/1/1985	VA	MD-30112-BLQ-01; MD-30112-WDS-01
AEP GLEN FERRIS 1 H	12/1/2011	WV	MD-90220-WAT-01
AEP SUMMERSVILLE 1-2 H	1/1/2001	WV	MD-90178-WAT-02
AP BEECH RIDGE 1 WF	1/1/2010	WV	MD-20137-WND-01
AP BEECH RIDGE 2 WF	3/1/2020	WV	MD-20203-WND-01
AP BLACK ROCK 1 WF	10/1/2021	WV	MD-20217-WND-01
AP GREENLAND GAP 1 WF	12/1/2007	WV	MD-20109-WND-01
AP LAUREL MOUNTAIN 1 WF	5/1/2011	WV	MD-20136-WND-01
AP MISC HYDRO H	6/1/1938	WV	MD-90102-WAT-01
AP PINNACLE 1 WF	11/1/2011	WV	MD-20135-WND-01
AP WILLOW ISLAND 1 H	11/1/2015	WV	MD-90258-WAT-02
Belleville	4/1/1999	WV	MD-90243-WAT-02
Covanta New Martinsville Energy	10/1/1988	WV	MD-90179-WAT-02
London	12/1/1935	WV	MD-90200-WAT-01
Marmet	12/1/1935	WV	MD-90201-WAT-01
VP NEW CREEK 1 WF	11/1/2016	WV	MD-20179-WND-01
Winfield	1/1/1938	WV	MD-90203-WAT-01

## Appendix G Price of RECs by Fuel Source

Fuel Source	Price/REC
Black Liquor	\$14.53
Geothermal	\$17.04
Landfill Gas	\$17.69
Municipal Solid Waste	\$22.96
Other Biomass Gas	\$18.07
Solar Hot Water	\$58.71
PV Solar	\$59.11
Tier 1 Hydroelectric	\$18.75
Wood and Waste Solids	\$13.26
Waste Heat	\$18.57
Wind	\$19.54
Tier 2 Hydroelectric	\$7.70