



**Arkansas Electric
Cooperative Corporation**

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ARK PUBLIC SERV. COMM.

SECRETARY OF COMM.

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FILED

30 March 2012

Ms. Jan Sanders
Secretary of the Commission
Arkansas Public Service Commission
1000 Center Street
P.O. Box C-400
Little Rock, AR 72203

RE: IN THE MATTER OF CERTAIN REPORTS REQUIRED TO BE FILED BY
CRAIGHEAD ELECTRIC COOPERATIVE CORPORATION
DOCKET NO. 08-052-RP

Dear Ms. Sanders:

This letter and the attached filing represent the Electric Cooperatives of Arkansas¹ ("Electric Cooperatives") 2011 Joint Report on Energy Efficiency ("Report") due on 1 April 2012.

Order No. 12 in Arkansas Public Service Commission ("Commission") Docket No. 06-004-R entered on 11 January 2007 ("Order No. 12") granted the Electric Cooperatives an exemption from the Rules for *Conservation and Energy Efficiency Programs* ("EER"). As a condition of that exemption, the Electric Cooperatives were directed to file an annual report with the Commission regarding the Electric Cooperatives' "... EE programs and their results" ("Order No. 12, page 18).

¹ Arkansas Valley Electric Cooperative Corporation; Ashley-Chicot Electric Cooperative, Incorporated; C & L Electric Cooperative Corporation; Carroll Electric Cooperative Corporation; Clay County Electric Cooperative Corporation; Craighead Electric Cooperative Corporation; Farmers Electric Cooperative Corporation; First Electric Cooperative Corporation; Mississippi County Electric Cooperative, Inc.; North Arkansas Electric Cooperative, Incorporated; Ouachita Electric Cooperative Corporation; Ozarks Electric Cooperative Corporation; Petit Jean Electric Cooperative Corporation; Rich Mountain Electric Cooperative, Incorporated; South Central Arkansas Electric Cooperative, Incorporated; Southwest Arkansas Electric Cooperative Corporation; Woodruff Electric Cooperative Corporation; and Arkansas Electric Cooperative Corporation.

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The Report contains the following:

Attachment A is a summary of the Electric Cooperatives' energy efficiency ("EE") programs. In addition to a written summary of the various EE programs, Attachment A contains examples of EE educational material used by the Electric Cooperatives, a report on the effectiveness of the Electric Cooperatives' various demand response programs, and a report on the Electric Cooperatives' current and planned use of Smart Grid technologies. Attachment A also serves as Arkansas Electric Cooperative Corporation's EE Report.

Attachment B contains each member cooperative's 2011 EE Report with supporting material.

While the Electric Cooperatives are exempt from the EER, they are voluntary participants in two programs which are mandatory for natural gas and electric investor owned utilities. These programs are:

1. The Energy Efficiency Arkansas program. The Electric Cooperatives contributed \$112,463.35 for the period 1 January 2011 through 31 December 2011; and
2. The development and updating of the Deemed Savings Report. The Electric Cooperatives contributed \$17,307.23 for the period 1 January 2011 through 31 December 2011.

Please direct any questions regarding the Electric Cooperatives' 2011 Joint Report on Energy Efficiency to Doug White (501-570-2291) or Forest Kessinger (501-570-2422).

Sincerely,



Forest Kessinger
Manager, Rates and Forecasting

Attachment

cc: Member Managers
Duane Highley

**Electric Cooperatives of Arkansas
Joint Report**

Docket No. 08-061-RP

Attachment A

Arkansas Electric Cooperative Corporation

Docket No. 08-060-RP

AECC Programs & Services for Collective ARPSC Report

The Electric Cooperatives of Arkansas were early promoters and educators of energy efficiency and building science. History reminds us of the 1970's energy crisis that created challenges and opportunity for the electric cooperatives. Fast-forward to 2012, and the electric cooperatives are addressing similar challenges and opportunity stemming from current politics, regulatory requirements, energy policy and other influences.

The influences of forty years ago prompted the genesis for energy efficiency education and awareness. The electric cooperatives business philosophy, business model and principles were the foundation to explore, learn and teach our members how they could take charge of their utility bills, home comfort and how to wisely use electricity.

Sharing energy efficiency knowledge and proven building science (with our membership) helped the cooperatives offset base load generation resources then, and even now 40 years later. Since our core business model is to provide service to those we serve, with provisions for reliable electricity at an affordable price, the Electric Cooperatives will continue to include energy efficiency education in future work plans. The following report identifies those areas and provides an update of progress in 2011.

Residential Energy Audits

Participating distribution cooperatives offer varying energy audit programs. Some offer walk-through and checklist inspections. Others offer comprehensive audits including blower-door tests, duct blaster leakage tests and infrared thermography for verification of air infiltration and thermal analysis. Some incorporate theatrical smoke/fog devices in conjunction with the duct blaster for visual reference.

AECC's Manager of Residential Energy Marketing is available to assist all distribution cooperatives with comprehensive energy audits when requested. He is a Building Performance Institute (BPI) credentialed Building Analyst. He is also certified by Forward Looking Infrared (FLIR's) Infrared Training Center as an Infrared Building Investigator. (Exhibit One)

The following electric cooperatives requested energy audit assistance in 2011:

First Electric, Ozarks Electric, Petit Jean Electric, Craighead Electric, North Arkansas Electric, Ouachita Electric, Woodruff Electric, South Central Electric, Mississippi County Electric and C&L.

Audit results and a prescriptive list of retrofit or repairs are left with each homeowner. The host cooperative retains the test results. Also, the hosting cooperative may offer reputable resources to repair or retrofit each component or measure on the list.

Blower-Door and Infrared Equipment

AECC maintains two sets of Energy Conservatory blower-door diagnostic equipment with DG-700 computers and Tech-Tite software operating systems. AECC also has one Energy Conservatory duct-blaster unit and maintains two FLIR B40 and one B360 infrared cameras. Trained personnel from the distribution cooperatives may borrow the diagnostic equipment and FLIR infrared thermal imaging cameras through an equipment loan program.

An additional Energy Conservatory duct-blaster unit is budgeted for purchase in 2012.

AECC is prepared to remain on the cutting edge of technology and offered to become a beta test site for a new energy audit technology. Currently the Energy Conservatory is experimenting with a "smart tablet" application technology. Essentially, both the blower-door and duct-blaster equipment can be remotely operated with tablet technology via Bluetooth technology. Customer reports can be generated and distributed electronically from the tablet device via a personal hotspot or wireless Internet connection.

Furthermore, AECC is planning to upgrade its infrared equipment with a higher resolution FLIR infrared camera that will transmit images via Bluetooth to the final blower-door and duct-blast customer report. Work in progress.

Comprehensive Training and Certification

AECC is committed to training, education and information. Staying on the cutting edge of building-science technology and providing the proper training to representatives at the distribution cooperative level remains an annual goal.

A key benefit of this training directly impacts the electric cooperative membership. Since electric cooperatives are local, its members have direct contact with knowledgeable employees that reside in their hometown or proximity.

FLIR Certified Thermographer

The 4-day certification course gives students a depth of the knowledge necessary to perform infrared (IR) surveys of single or multifamily dwellings to identify weatherization issues. The class covers IR camera operation, and basic report

generation, fundamentals of IR science, heat transfer principles; IR weatherization surveys techniques, tips, and application examples.

Students are trained to identify thermal anomalies that indicate missing insulation and insulation defects due to damage, moisture and improper installation. The IR survey can also provide indication of moisture or wetness as well as air infiltration and exfiltration. The course covers the caveats and environmental conditions necessary for a successful energy audit IR survey, as well as pitfalls to avoid.

Certification credentials require successful completion of course requirements, passing a written exam, and submission of an energy audit case study field assignment.

AECC's Manager of Residential Energy Marketing, Ozarks Electric Cooperative Key Accounts Manager and Member Services Representative earned FLIR's Level I-Thermal Imaging for Energy Audits Certification in February 2010.

Thirteen more electric cooperative individuals received the same FLIR credentials in 2011. They were:

First Electric Cooperative

Doug Brandon
Anthony Galloway
David Hannah
David Copeland

Clay County Electric Cooperative

Nick Manatt
Lyndal Hutsell

Ouachita Electric Cooperative

Alan Ferguson

Arkansas Valley Electric Cooperative

Aaron Mantooth

Carroll Electric Cooperative

Joe Magnini
Brian Ayers
Brian Wise
Mike Jones

Petit Jean Electric Cooperative

Dale Smith

Building Performance Institute-Building Analyst Credentials

AECC's Manager of Residential Energy Marketing and Member Services Representative from Arkansas Valley Electric Cooperative earned the Building Performance Institute Building Analyst credentials in 2010.

The Building Performance Institute (BPI) is a recognized leader in developing and supporting high quality energy audit training courses. BPI training is recognized by Energy Star, the Department of Energy and numerous electric utilities.

The 5-day comprehensive Building Analyst class teaches students that the house is a system and most construction components are interconnected. The relationship between all interconnected systems of the house is the key to its overall performance, efficiency, and durability. Moreover, home performance is essential to the health, safety, and comfort of occupants. Certified BPI professionals are trained to quickly target, diagnose, and solve household performance problems such as high utility bills, air infiltration, mold, mildew and ice dams to name a few.

The course outline focuses on principles of energy and building science, the energy process, the building shell and thermal envelope, airflow, moisture management, air quality, combustion safety and carbon monoxide monitoring, HVAC-Lighting-Appliance-Domestic Hot Water as building systems and diagnosis of common building problems, blower-door and duct blaster testing and combustion appliance testing.

Certification credentials require successful completion of the comprehensive 5-day course requirements, passing a 2-hour, 100 question written exam, and passing a 3-hour field exam.

Building Performance Institute-Building Analyst Credentials Class 2011

AECC sponsored the BPI Building Analyst certification class March 7-11, 2011. The class was facilitated by the Kansas Building Science Institute from Manhattan, Kansas. KBSI is an authorized BPI facilitator and was utilized by the Arkansas Energy Office for 2010 BPI training.

The following individuals earned the BPI Building Analyst credentials:

Joey Magnini-Carroll Electric

Brian Wise-Carroll Electric

Doug Brandon-First Electric

David Copeland-First Electric

Anthony Galloway-First Electric

David Hannah-First Electric
Keith Kaderly-Ozarks Electric
James Reid-Ozarks Electric
Dale Smith-Petit Jean Electric
Jerry Pleasants-Woodruff Electric

Commercial & Industrial Energy Efficiency and Audits

Three commercial and industrial energy audits were conducted in 2011.

These audits are designed to take a comprehensive look at the facility and make recommendations for improved energy efficiency measures. Prior to the audit, data is collected concerning the physical characteristics of the facility and energy usage. Then a detailed walk-through and tour of the facility is conducted. Following the investigation, an analysis report is produced for the company. It highlights various recommendations for decreased waste and improved efficiency. These may involve lighting, HVAC, windows, boilers/chillers, processes, etc.

2011 C&I Audits:

- Arkansas Sherriff's Youth Ranch Facility near Amity South Central Electric Cooperative Corporation. (Exhibit Two)
- Roach's Grocery in Lepanto served Craighead Electric Cooperative Corporation. (Exhibit Three)
- Thriftway Grocery in Clinton served by Petit Jean Electric Cooperative Corporation. (Exhibit Four)

Website Based Energy Efficiency Information & Communications

In an effort to reach additional audiences, the Electric Cooperatives of Arkansas offer the *Arkansas Living* magazine via electronic and web-based communications programs. These include the cooperative website, Facebook page and an "opt-in" e-newsletter.

Website Visitors

The total number of visitors to the www.ecark.org website for 2011 was 133,425. The average number of monthly visitors was 11,119. The largest numbers of hits were obtained during June with 19,293. This surge is attributed to the Energy Efficiency Makeover contest promotional campaign.

Rural Arkansas Living e-newsletter

In June 2009, the Electric Cooperatives of Arkansas launched an "opt-in" electronic newsletter, *Arkansas Living*. The newsletter is e-mailed to "opt-in" subscribers prior to the mailing of the print version. This medium was available throughout 2011.

The e-newsletter highlights key areas of the publication and provides a link to the flipping book version of the magazine. The newsletter has 3,000 opt-in subscribers. Subscriptions increase during June, July and August when the application process for the Energy Efficiency Home Makeover are underway.

The *Arkansas Living* e-newsletter is archived on the www.ecark.org website. This medium provides additional access to energy efficiency information printed in the magazine. (Exhibit Five)

Arkansas Living Social Media

In 2011, AECC Corporate Communications launched Facebook, Twitter and YouTube site for *Arkansas Living* magazine. The sites have improved interaction with its member owners. In addition to conventional mediums, energy efficiency education, awareness, components and measures are also conveyed regularly via social media.

The *Arkansas Living* online “flipping book” version draws additional readers to the electronic version of the publication. New status updates appear on the news feed of a person that has opted to “like” the *Arkansas Living* page.

Website Resources

A wide array of energy efficiency tips, do-it-yourself measures and methods are available on the site and a unique URL is promoted also: www.smartenergytips.org. The URL is the repository for energy efficiency resources.

In 2011, the site averaged 2,125 visits per month with a total of 27,629. The month of peak visits was June with 10,271. It should be noted that this was during the media campaign for the 2011 Energy Efficiency Home Makeover.

Participating distribution cooperatives and AECC continue to offer and host a wealth of energy efficiency information and resources online. Information includes:

Intuitive energy usage calculators including heat pumps, lighting and televisions

Appliance usage calculators

Do-it-yourself audits

101 energy saving tips

Doug Rye’s weekly radio show MP3’s and iTunes Podcasts

Marathon water heaters

General Electric “Geo-Springs” hybrid water heater

Energy efficiency “Makeover” program

Energy efficient model home program

CFL energy saver

Water heater energy saver

HVAC energy saver

How to read an electric meter
Commercial energy efficiency guide
Old appliance information
Energy Star information
Green Power
Renewable energy
LED Christmas lighting information
Guide for where energy dollars are spent
Silent plug loads/standby power and more...

The website is also a repository for all “image” and “energy efficiency” television and radio spots. For complete website details and to view all television commercials and listen to radio spots visit www.aecc.com or www.smartenergytips.org (Exhibit Six)

Web Based Real-Time Hydroelectric Power Generation

The Electric Cooperatives of Arkansas completed the first of three hydropower plants on the Arkansas River in one of their most ambitious generation projects ever in December of 1988.

The plant, the Clyde T. Ellis Hydroelectric Generating Station, was built at the James W. Trimble Lock and Dam near Fort Smith. It marked the cooperatives' commitment to a long-term, low-cost power source for their members, as well as their dedication to environmentally-friendly power, long before it was fashionable to do so. Later in the 1980s and 90s, the cooperatives completed two other hydropower plants, making the total investment in renewable energy resources at about \$330 million.

Daily, monthly and lifetime cumulative generation output totals from AECC's hydroelectric power plants is available real-time to all cooperative members and the general public at: <http://www.aecc.com/renewable-resources/hydroelectric-power/> (Exhibit Seven)

Web Based Real-Time Solar Power Generation System

The Electric Cooperatives of Arkansas are testing another source of renewable power generation – solar energy. In early 2009, solar panels were installed as part of a pilot program to test small-scale solar power systems. Preformed Line Products installed the system which has 33 panels at a cost of approximately \$47,000. In addition to the panels, the system has an inverter that converts the DC power produced by the panels to AC power that is used in the AECC Utility Sales building. The system has a generation capacity of 7kW.

Daily, monthly and lifetime cumulative generation output total for the solar project is available real-time to all cooperative members and the general public at: <http://www.aecc.com/renewable-resources/solar-power/> (Exhibit Eight)

Informational Brochures

AECC's marketing collateral includes new energy efficiency brochures. AECC offers a mix of brochures that are customizable for specific electric cooperatives, or an Electric Cooperatives of Arkansas version. New energy efficiency creative includes the following brochures:

Energy Efficiency
General Electric GeoSpring hybrid electric water heater
Compact Fluorescent Lighting
Energy Efficiency In A Manufactured Home
Marathon Water Heaters
Airs Source Heat Pumps
Geothermal Heat Pumps
Copies of the brochures are attached. (Exhibit Nine)

2011 Energy Efficiency Calendar

A 2011 energy-efficiency themed calendar was created for statewide distribution to cooperative members. All seventeen cooperatives participated in the distribution of the calendar through their local and district offices. Each month contained energy savings tips and educational information. (Exhibit Ten)

Doug Rye Radio Show Sponsorship & Consulting Services

"Home Remedies" Radio Show Sponsorship

In 2011, the Electric Cooperatives of Arkansas continued to underwrite sponsorship for the radio show "Home Remedies" hosted by energy efficiency consultant Doug Rye. The weekly Saturday morning live, talk-radio show airs statewide and focuses solely on energy efficiency education and awareness. Doug's co-host is Tom Hunt, long time founding member of the Arkansas Heat Pump Association and HVAC instructor for Pulaski Technical College.

The Troufion Radio Network indicated the "Home Remedies" radio program is the highest-rated show in Arkansas during the Saturday 9:00-10:00 a.m. time slot. The popular weekly show has statewide coverage and more Arkansas electric consumers than any other single broadcast program in the state with thousands of weekly listeners. A large percentage of the listeners are electric cooperative members. Many listeners who are not electric cooperative members benefit from the radio show.

The Electric Cooperatives of Arkansas are the presenting sponsor of this statewide radio program. Two, 30-second energy efficiency educational advertisements are

part of the sponsorship package. The show aired live 48 out of 52 weeks. Weekly updates on the energy efficiency makeover project were made each Saturday throughout the eight-week project. Two new-home and retrofit “best of” shows were pre-recorded for the Christmas holiday season. ECA has a repository for previous radio shows. To listen to one of Rye’s shows visit:

<http://www.aecc.com/energy-efficiency/doug-rye/doug-rye-radio/>

Due to the popularity of the show and the strong interest in energy efficiency by our members, AECC will continue sponsorship of the radio show in 2012.

Doug Rye’s “Home Remedies” Radio Show Podcast

In January 2010, AECC began uploading each Home Remedies radio show to Apple’s iTunes interface so that listeners could listen to previously aired show in a podcast format. 2011 shows are available via podcast.

Podcasts » Education » Educational Technology » Doug Rye



Subscribe Free

Category: Educational Technology
Language: English
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More From Doug Rye

Website

Links

Report a Concern

Doug Rye's Home Remedies

Podcast Description

Doug Rye may be the best-known residential energy efficiency consultant in the nation. Since 1990, his weekly “Home Remedies” radio show has provided practical insight into energy-efficient new home construction and implementation of energy efficiency measures in existing homes. Doug is known nationwide for his honest down-to-earth and friendly style. His show airs live each Saturday morning from 9:00 a.m. to 10:00 a.m. (Central Time) on Little Rock’s KABZ, 103.7 FM “Home... [More](#)

#	Name	Time	Released	Description	Popularity	Price
1	February 12th, 2011	40:59	2/14/11	Doug Rye answers your energy questions!	100%	FREE
2	February 5th, 2011	40:59	2/7/11	Doug Rye answers your energy questions!	100%	FREE
3	January 29th, 2011	40:59	1/31/11	Doug Rye answers your energy questions!	100%	FREE
4	January 22nd, 2011	40:59	1/22/11	Doug Rye answers your energy questions!	100%	FREE
5	January 15th, 2011	40:59	1/17/11	Doug Rye answers your energy questions!	100%	FREE
6	January 8th, 2011	40:59	1/11/11	Doug Rye answers your energy questions!	100%	FREE
7	December 25th, 2010	40:59	12/20/10	Doug Rye answers your energy questions!	100%	FREE
8	December 11th, 2010	40:59	12/13/10	Doug Rye answers your energy questions!	100%	FREE
9	December 4th, 2010	40:59	12/5/10	Doug Rye answers your energy questions!	100%	FREE
10	November 27th, 2010	40:59	11/29/10	Doug Rye answers your energy questions!	100%	FREE
11	November 20th, 2010	40:59	11/22/10	Doug Rye answers your energy questions!	100%	FREE
12	November 13th, 2010	40:59	11/15/10	Doug Rye answers your energy questions!	100%	FREE
13	November 6th, 2010	40:59	11/6/10	Doug Rye answers your energy questions!	100%	FREE
14	October 30th, 2010	40:59	11/1/10	Doug Rye answers your energy questions!	100%	FREE
15	October 23rd, 2010	40:58	10/25/10	Doug Rye answers your energy questions!	100%	FREE

Total: 58 Episodes

Doug Rye Energy Efficiency Consulting Services and Seminars

The Electric Cooperatives of Arkansas also retain Doug Rye as an energy efficiency consultant and underwrite sponsorship of numerous energy efficiency educational seminars throughout the state. The co-ops have utilized Rye’s expertise for years to promote total electric energy efficient home construction, Marathon and GE GeoSpring Hybrid water heaters, heat pumps, and geothermal technology. Doug has a loyal statewide following and his energy efficiency measures are more popular than ever.

During 2011, distribution cooperatives continued to host his popular energy efficiency educational seminars. A total of 25 seminars were held in 2011. Attendance varies from city to city. Yet, it's not uncommon for attendance to reach 100+ per seminar.

DOUG RYE APPEARANCES FOR LOCAL COOPS IN 2011

DATE	COOP.	PURPOSE	TOWN	ATTENDANCE
22-Jan	CRAIGHEAD ELECTRIC	MODEL HOME OPEN HOUSE	JONESBORO	350
24-Jan	CRAIGHEAD ELECTRIC	SEMINAR	WALNUT RIDGE	20
25-Jan	CRAIGHEAD ELECTRIC	SEMINAR	JONESBORO	25
26-Jan	CRAIGHEAD ELECTRIC	SEMINAR	PARAGOULD	20
3-Mar	WOODRUFF ELECTRIC	SEMINAR	WYNNE	50
11-Mar	OZARKS ELECTRIC	SEMINAR FOR APPRAISERS	FAYETTEVILLE	35
24-Mar	CLAY COUNTY ELECTRIC	SEMINAR	POCAHONTAS	20
7-Apr	CARROLL ELECTRIC	SEMINAR	SHELL KNOB, MO	20
14-Apr	PETIT JEAN ELECTRIC	ENERGY AUDIT VISIT-BUFFALO RIVER VISITOR CENTER	MARSHALL	8
19-May	CARROLL ELECTRIC	SEMINAR	JASPER	25
20-May	CARROLL ELECTRIC	SEMINAR	HOLIDAY ISLAND	25
24-May	OZARKS ELECTRIC	SEMINAR	FAYETTEVILLE	40
25-May	OZARKS ELECTRIC	SEMINAR	FAYETTEVILLE	30
31-May	C & L ELECTRIC	EAST STUDENTS AND COMMUNITY	STAR CITY	40
3-Jun	CLAY COUNTY ELECTRIC	ANNUAL MEETING	CORNING	100
7-Jun	PETIT JEAN ELECTRIC	SEMINAR	CLINTON	25
9-Jul	OZARKS ELECTRIC	MEMBERS APPRECIATION MODELHOME	FAYETTEVILLE	200
21-Jul	OZARKS ELECTRIC	EAST TEACHERS STATE MEETING	ROGERS	200
9-Sep	FIRST ELECTRIC	SEMINAR - GREEN CONFERENCE	STUTT GART	50
20-Sep	FIRST ELECTRIC	SEMINAR	BRYANT/BENTON	30
27-Sep	PETIT JEAN ELECTRIC	SEMINAR	MARSHALL	35
29-Sep	FIRST ELECTRIC	EAST STUDENTS AND COMMUNITY	HOT SPRINGS	40
3-Oct	CRAIGHEAD ELECTRIC	EAST STUDENTS AND COMMUNITY	HARRISBURG	50
5-Oct	FIRST ELECTRIC	EAST STUDENTS AND COMMUNITY	MORRILTON	150

15- Nov	CRAIGHEAD ELECTRIC		EAST STUDENTS AND COMMUNITY	LYNN	150
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Doug also fielded numerous energy efficiency related telephone calls from cooperative members. He is also directly responsible for the referral of several high-efficiency Marathon electric water heater sales annually. Doug also endorses and promotes the new Energy Star rated General Electric Geo-Springs hybrid water heater, which has an energy factor (EF) 2.3.

Rye's energy efficiency consulting services and educational energy seminar programs are part of AECC's overall 2012 energy education work plan.

Doug Rye Model Home Program

Promotion and education of energy-efficient heat pumps, energy-efficient home construction, technologies and appliances has been an important goal of the electric cooperatives for decades.

The Doug Rye model home program began in 1998 and is a collaborative effort between the cooperative member homeowner, their builder and the host electric cooperative. The program requires the cooperative member and builder to consider the home as an integrated energy-efficient system rather than a random assortment of building materials. The model home is also an excellent educational tool for marketing all electric, energy-efficient homes.

During construction, the energy auditor from the host cooperative and AECC's manager of residential energy marketing monitors each component and measure within the home. Once satisfied the component is installed properly, the auditor photographs and video documents for future teaching opportunities.

The model home provides an important resource to member owners, homebuilders and related trade allies about the construction of energy-efficient homes, the use of heat pumps, energy-efficient appliances and properly installed measures and components.

Ozarks Electric Cooperative sponsored a home in 2011, in part with the northwest Arkansas Parade of homes. Ozarks model home was part of the open house weekend that hosted hundreds of interested visitors. Some visitors even drove in from neighboring states.

With 27 total homes built since its origin, the model home program continues in popularity. And with the continuing importance of energy efficiency education and awareness, we recommend retaining this successful program in 2012.

For complete details about the model home program visit:

<http://www.aecc.com/energy-efficiency/model-home-program/>

Doug Rye Arkansas Living Column

Doug Rye provides a home science and energy efficiency column to the Arkansas Living magazine. The column is shared among 30+ electric cooperatives around the country. The ECA website is a repository for previous columns. To read previous columns visit: <http://www.aecc.com/energy-efficiency/doug-rye/doug-ryes-column/>

Touchstone Energy Customer Service Representative Contacts & Energy Efficiency Education

The “local” nature of electric distribution cooperatives and their business offices offer opportunities for one-on-one personal contact with those we serve. Many member services employees have general energy efficiency knowledge and resources designed to answer questions about utility costs, consumption, home comfort, Energy Star appliances, HVAC and building science.

AEEC sponsored specialized statewide training in 2011 for customer service representatives. National Rural Electric Cooperatives and its national brand, Touchstone Energy, designed the curriculum. The curriculum focuses entirely on energy efficiency, awareness and education.

The following electric cooperative individuals attended one day course which ran October 19 ad 20, 2011:

Lynn Moore

Candy Robbins

Michael Counts

Amber Herren

Steve Cate

Mike Caldwell

Amber Foster

David Copeland

Shelley Burrow

Tina Crossland

Wayne Winter

Greg Knight

Holly Pate

Sandy Hodges

Konnie Coleman

DeAnn Arnhart

Leah Rouse

Carolyn Hayes

Beth Vespero

Instructor

Ashley Chicot Electric

Clay County Electric

Clay County Electric

Clay County Electric

Clay County Electric

First Electric

First Electric

First Electric

First Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

Woodruff Electric

Woodruff Electric

Vera Dawson

Mickey Hudson

Terry Shadwick

Camella Davis

Lynn Moore

James Pipkin

Tony Hudson

Kara Townsend

David A. Markum

Brady Davis

Jenn Wilburn

Karen Hook

Justin Etter

Danielle Singleton

Kathy Harkey

Dianna Robinson

Danielle LeMay

Jerry Estes

Sherry Jackson

Becki Griffin

Heather Busch

Melissa Wagner

Kristi Grant

Terry Pleasants

Cindy Holland

B.J. Lane

Woodruff Electric

Woodruff Electric

Woodruff Electric

Woodruff Electric

Instructor

Clay County Electric

Clay County Electric

Clay County Electric

Clay County Electric

Craighead Electric

Craighead Electric

Craighead Electric

Craighead Electric

First Electric

First Electric

First Electric

First Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

North Arkansas Electric

Woodruff Electric

Woodruff Electric

Woodruff Electric

Marathon Energy Efficient Water Heaters

Marathon, a subsidiary of Rheem, is a manufacturer of energy efficient electric water heaters. The Marathon design has been on the forefront of efficient units for years. Their hot water storage tanks are insulated with six inches of open-cell foam insulation on both the top and bottom. The sides are also insulated with three inches of open-cell foam insulation. Units range from 40-105 gallons and have an Energy Factor rating of .91-.95 depending on the unit. Marathon research and development are currently working on units that will qualify for Energy Star rating. That development is still a work in progress.

The Marathon is a perfect storage medium when used in conjunction with a geothermal domestic hot water/desuperheater feature. All of the distribution cooperatives support and promote this concept.

All of the AECC electric distribution cooperatives promote use of this specific brand. Most offer them for sale locally or promote availability from Arkansas Electric Cooperatives, Inc., (AECI) Utility Sales & Services division located in Little Rock.

AECI Utility Sales and Services lead the nation in Marathon water heater sales within their five state service territory. This is attributed continuous promotion of all components of energy efficiency via Doug Rye radio and seminars, ECA website information and earned media events.

General Electric Geo-Spring Hybrid Heat Pump Water Heater

Initially, ECA was chosen as one of nine electric utilities nationwide to partner with General Electric to promote and sell their new industry-exclusive GE GeoSpring™ Hybrid Electric Water Heater. The unit is designed to provide the same hot water homeowners are accustomed to, but requires only about half the energy to produce it. For example, based on the same standard tank water heater that uses approximately 4800 kWh per year, the new GE GeoSpring™ Hybrid Water Heater is designed to:

1. Consume up to 62% less energy than a standard electric water heater
2. Result in energy savings of \$320 per year

**Based on DOE test procedure and comparison of a 50-gallon standard electric tank water heater using 4881 kwh per year vs. the GE heat pump water heater using 1856 kwh per year.*

The GE GeoSpring™ Hybrid Water Heater combines energy-saving heating technology with traditional electric heating systems used in most standard water heaters on the market today without sacrificing the amount of hot water it can deliver.

This hybrid technology is designed to absorb heat in ambient air and transfer it into the water. Since it requires much less energy to absorb and transfer heat than it does to generate it – as a standard electric water heater would – the GE GeoSpring™ Hybrid Water Heater provides the same amount of hot water while using less energy.

The GE GeoSpring™ Hybrid Water Heater features a user-friendly electronic control system that offers both simplicity and flexibility, giving consumers as much or as little control of operating modes as they like. Water temperature may be precisely set from 100 to 140 degrees to maximize energy benefits and comfort.

The unit exceeds the ENERGY STAR® minimum requirement of a 2.0 energy factor (EF) with a 2.35 EF or 235% efficient.

Similar to Marathon, the General Electric GeoSpring unit is available for purchase to all electric cooperative members through their local electric cooperative or the AECC Utility Sales Division.

During 2011, the electric cooperatives also promoted the Federal energy tax credit and the Arkansas Energy Office Energy Star rebate programs.

For more information visit: <http://www.aecc.com/energy-efficiency/ge-hybrid-water-heater> and <http://www.geappliances.com/heat-pump-hot-water-heater/>

Air Source & Geothermal Heat Pump Information

All of the AECC electric distribution cooperatives promote use of air-source and geothermal heat pumps. Cooperatives offer information with brochure marketing collateral and personal one-on-one consultation with members.

AECC is a current and longtime member of the Arkansas Heat Pump Association.

Compact Fluorescent Lamp Programs

All of the AECC distribution cooperatives promote the use of compact fluorescent lighting. Some offer sale of the product from their local and district offices. Some have implemented creative promotional and distribution campaigns.

LED Lamp Technology

All of the AECC distribution cooperatives are promoting the emergence of LED lighting technology. Many have LEDs installed in test applications. Work in progress.

Building Guidelines for Energy Efficiency Booklet

The Electric Cooperatives of Arkansas published the first edition of this booklet in 1997. The informational booklet was written to provide energy efficiency guidelines and measures for builders, sub-contractors and homeowners. Proper installation of components into a new or existing home will provide energy savings; improve comfort and lower utility bills. ECA promotes the idea that it is far more cost effective to incorporate energy efficiency measures into a new home, than to add them after construction has been completed.

The booklet is available from AECC and any distribution cooperative. Over 6000 copies have been distributed since 1997.

The booklet underwent a complete revision in 2011. The new version includes current building science endorsed by industry experts.

The latest edition is available online or a printed version is available at every local electric cooperative office. <http://aecc.com/energy-efficiency/building-guidelines/> (Exhibit Eleven)

Arkansas Living Magazine

The Electric Cooperatives of Arkansas continue to promote energy efficiency practices, measures, components and appliances via the cooperatives' statewide magazine, *Arkansas Living*. The publication is the largest circulated publication in Arkansas as it is distributed to approximately 380,000 readers each month.

In 2011, energy efficiency topics were covered in 69 articles, or approximately 5.75 articles per month. The articles range from easy do-it-yourself tips, general information, and comprehensive energy efficiency messages. The November 2011, edition was focused entirely on energy efficiency education, awareness, tips and much more. (Exhibit Twelve)

Each month the magazine includes a column by Doug Rye on a variety of energy efficiency tips. This column also runs in cooperative publications across the United States as the Electric Cooperatives of Arkansas provide the columns to the other electric cooperatives across the nation free of charge. Each edition of the magazine is posted to the statewide association's website. (Exhibit Thirteen)

Energy efficiency is promoted within the publication via news articles and advertisements. Additionally, the publication's contents are promoted through an "opt-in" e-newsletter that is distributed each month. The e-newsletter and entire publication is also posted and achieved at www.ecark.org, which allows viewers to review the publication in an electronic format.

In 2011, social media was also used to promote the magazine and, in turn, the energy efficiency data.

News Articles

Energy efficiency topics were covered in 38 articles, or approximately 3.16 articles per month. The articles range from easy do-it-yourself tips, general information, and comprehensive energy efficiency messages. Each month the magazine includes a column by Doug Rye on a variety of energy efficiency tips. This column also runs in cooperative publications across the United States as the Electric Cooperatives of Arkansas provide the columns to the other electric cooperatives across the nation free of charge. The columns are archived at: <http://www.aecc.com/energy-efficiency/doug-rye/doug-ryes-column/>.

Month	Article
January	New Year's Resolution: Seal Leaks Do You Have an Incandescent Bulb in Your Closet? A Comforting Thought

February	<p>Give Your Valentine The Gift of Energy Efficiency</p> <p>White Walls Can Cut Need for More Lights</p> <p>Familiar Light Bulb On Its Way Out</p> <p>Sealing Your Home from the Elements</p> <p>"Happy" Summer Comfort</p>
March	<p>Upgrade Your Windows and Save</p> <p>Happy Winner and Winter Comfort</p>
April	<p>Tame the Humidity in Your Home's Air</p> <p>The Truth About Heat Pumps</p>
May	<p>Heat Pump Graduation: Class of 2011</p>
June	<p>Time for Apply for the Makeover</p> <p>Save Energy and Stay Comfortable this Summer</p> <p>Recycle Your Old Refrigerator</p> <p>Planning is Important</p> <p>Cool Energy Costs with a New Refrigerator</p>
July	<p>Cut Bills with New Heating, Cooling System</p> <p>Keep CFLs from Burning Out Too Soon</p> <p>It Is Hot and I Hope that You Have Your Plan Ready</p>
August	<p>Keep the Sun Out to Stay Cool</p> <p>"The More Things Change, The More They..."</p>
September	<p>Makeovers, MACT Rule and More</p> <p>Cooperatives Offer Building Guidelines for Energy Efficiency</p> <p>Big TVs are Big Energy Hogs</p> <p>Fall Planting Can Save Energy Next Summer</p> <p>Cooperative Employees Receive Certification for Energy Audits</p> <p>Cleburne County Couple Wins \$50,000 Energy Efficiency Home Makeover</p> <p>"The More Things Change, The More They Remain the Same" – Part 2</p> <p>Beyond the Swirly Bulbs</p>
October	<p>Have Heating Inspection Before Halloween</p> <p>It May Be Time for Geothermal</p>
November	<p>Turning Off Isn't Enough: Unplug</p> <p>Saving Energy: Cooperatives are Energy Efficiency Leaders</p> <p>Cooperatives Celebrate Completion of Makeover 2011</p> <p>It's That Time of Year Again</p>
December	<p>Help for Mobile Homes</p> <p>Giving the Gift of Efficiency</p>

Advertisements

During 2011, there were 12 energy efficiency advertisements placed in *Arkansas Living*. The advertisers were the Arkansas Energy Office and the Electric Cooperatives of Arkansas. The Arkansas Energy Office advertisements were two-pages of information focused on energy efficiency facts, which included locating and sealing leaks, cooling systems, lighting and appliances, and heating systems. The cooperatives' advertisements promoted energy efficient water heaters, an energy efficiency home makeover and LED lighting.

Month	Advertisement
January	Arkansas Energy Office: <i>Energy Efficiency Facts: Locating and Sealing Leaks</i> Electric Cooperatives of Arkansas: <i>It's Time to Turn on Hot Technology and Hot Savings at Your House</i>
March	Electric Cooperatives of Arkansas: <i>Spring/Summer Energy Efficiency Tips</i>
April	Arkansas Energy Office: <i>Energy Efficiency Facts: Lighting and Appliances</i>
May	Arkansas Energy Office: <i>Energy Efficiency Facts: Cooling</i> Electric Cooperatives of Arkansas: <i>\$50,000 Energy Efficiency Home Makeover</i>
June	Arkansas Energy Office: <i>Energy Efficiency Facts: Locating and Sealing Leaks</i> Electric Cooperatives of Arkansas: <i>\$50,000 Energy Efficiency Home Makeover</i>
July	Electric Cooperatives of Arkansas: <i>\$50,000 Energy Efficiency Home Makeover</i>
November	Electric Cooperatives of Arkansas: <i>\$50,000 Energy Efficiency Home Makeover</i>
December	Arkansas Energy Office: <i>Energy Efficiency Facts: Heating</i> Electric Cooperatives of Arkansas: <i>Light Up the Holidays (LED lights)</i>

E-newsletter

The *Arkansas Living* e-newsletter has about 2,800 "opt-in" subscribers with an average growth of 10 percent per month. During 2011, there were links to seven energy efficiency articles.

Month	Article
January	New Year's Resolution: Seal Leaks
May	\$50,000 Energy Efficiency Home Makeover
June	\$50,000 Energy Efficiency Home Makeover
August	Keep the Sun Out to Stay Cool

September Cleburne County Couple Wins \$50,000 Energy Efficiency Home Makeover Beyond the Swirly Bulbs

November Saving Energy: Cooperatives are Energy Efficiency Leaders

Website

The www.aecc.com and www.ecark.org website averaged 11,119 visits per month in 2011. The total visits for the year was 133,425 with June being the peak month with 19,293 visits.

A wide array of energy efficiency tools and tips are available with the site and a unique URL is promoted also: www.smartenergytips.org. The URL is the warehouse for energy efficiency data. The site averaged 2,125 visits per month with a total of 27,629 for 2011. The month of peak visits was June with 10,271. It should be noted that this was during the media campaign for the 2011 Energy Efficiency Home Makeover.

Social Media

Arkansas Living magazine and the Electric Cooperatives of Arkansas launched social media efforts in 2011 with energy efficiency messages being a focal point for messaging. The mediums were Facebook and YouTube. The Arkansas Living Facebook page is <https://www.facebook.com/ArkansasLivingMagazine>. Energy efficiency articles mentioned in the magazine were spotlighted on the page throughout the year. The page was approaching 1,000 "Likes", but was re-launched due to the evolution of the magazine's name from *Rural Arkansas* to *Arkansas Living*. Currently, the Facebook page has approximately 500 "Likes". The cooperative's YouTube channel is <http://www.youtube.com/RuralArkLiving>. During Makeover 2011 staffers delivered weekly video updates regarding the progress of the makeover project. These videos included educational information to show viewers energy efficiency applications.

ERC Loan Programs

Energy Resource Conservation (ERC) loans are available from participating distribution cooperatives at low interest rates. ERC loans can be used to finance energy-saving devices and heating, ventilation and air-conditioning systems. Loans are available for weatherization improvements including: attic insulation, floor insulation, wall insulation, water pipe wrap, duct wrap, duct sealing, caulking and weather-stripping, ground cover for crawl space, attic ventilation, window and door replacement, storm doors and windows and minor repair work associated with installation.

The Magic of Energy Efficiency Educational Magic Show

Overview of Program

The Electric Cooperatives of Arkansas offer a very successful Making Accidents Disappear program to school age children. The program has stressed electrical safety to millions of children in Arkansas and across the United States since 2003.

In 2011, the show added a very simple energy efficiency message for your children. The message stressed turning off appliances and lights when not in use, or asking their parents to do so. Additionally, a magic program to promote energy efficiency to consumers was launched in 2009.

The program, The Magic of Energy Efficiency stresses the consumer's can save energy, save money and live comfortably by following a few energy efficiency tips. The message is intertwined with a wonder array of magic that empowers to consumers to see real results.

Messages

Practicing proven energy efficiency is more than a popular trend. Paying attention to responsible electricity use and consumption can help to preserve resources, save money and improve comfort in homes and businesses.

Components and Measures

Lighting

Replace traditional incandescent light bulbs with energy-efficient compact fluorescent bulbs which are up to four times more energy efficient and last nine times longer than incandescent bulbs. You could save up to \$57 in electricity costs over the life of each bulb. Turn off lights in rooms you aren't using, or install timers or occupancy sensors to reduce light consumption.

Heating & Cooling

Service accordingly. Have heating and cooling systems tuned up in the fall and spring. Make sure ductwork is intact and sealed properly. Clean or replace filters on air conditioners and heat pumps regularly. Use an air conditioner with a seasonal energy efficiency ratio (SEER) of 13 or higher. Use the proper size for your home.

If building a new home, consider installing an energy efficient geothermal system to cool and heat the home. Contact a reputable HVAC contractor to properly size the unit required for your home. Insulate. Make sure insulation levels are appropriate in the attic, exterior and basement walls, ceilings, floors and crawl spaces.

You can increase the comfort of your home and reduce annual heating and cooling usage up to 10 percent just by investing in proper insulation—cellulose is recommended—and sealing air leaks. Ceiling fans can bring energy saving benefits to the home. Most ceiling fans use only

about as much power as a 100-watt light bulb. When used properly, ceiling fans can save money on utility bills year-round.

Appliances

Replace aging, inefficient appliances with Energy Star appliances. Look for the Energy Star label to select energy-efficient models. Energy Star models use much less power than their counterparts.

Wash full loads of laundry using cold water when possible. Don't over-dry clothes, and clean the dryer's lint filter after every load to maximize air circulation.

Use the energy-saving settings on refrigerators, dishwashers, washing machines and clothes dryers. Air-dry dishes by opening the dishwasher instead of using the heated drying cycle.

Keep your refrigerator or freezer at recommended temperatures of 37° to 40°F for the refrigerator and 5°F for the freezer. Clean the coils regularly.

Cook smarter! Match the size of the pan to the heating element. Use electric pans, toaster ovens or microwaves for small meals. You will use less energy and reduce cooking time.

Turn off the television when no one is watching. Today's state-of-the-art, high definition sets offer amazing viewing, but also use more electricity than older televisions.

Use power strip cords and turn off when not in use. Shut down the computer. Conserve energy by turning off or using sleep mode for computers not in use for two hours or more.

Use power strip cords and turn off when not in use.

Water Heater

Set the temperature on water heaters to 120°F, and install an insulating blanket on the water heater (which should pay for itself in less than a year.) Consider replacing old units with a lifetime warranted, high energy-efficient Marathon water heater and save up to \$100 per year. Take a shower. In most households, it uses far less hot water than bathing.

List of Program, Location and Number of Attendees

1 program on 1/5/11 at Camden Child Enrichment for Ouachita Electric	35
1 program on 1/5/11 at Camden Child Development Center for Ouachita Electric	30
1 program on 1/12/11 at Young Elementary in Springdale for Ozarks Electric	497
2 program on 1/12/11 at Parson Hills Elementary in Springdale for Ozarks Electric	576
2 programs on 1/19/11 at McCrory Elementary for Woodruff Electric	355
2 programs on 1/21/11 at Malvern Elementary for First Electric Cooperative	350
2 programs on 1/24/11 at TG Smith Elementary in Springdale for Ozarks	658
1 program on 1/24/11 at Shaw Elementary in Springdale for Ozarks	475

1 program on 1/25/11 at West Fork Elementary for Ozarks Electric	517
1 program on 1/25/11 at Folsom Elementary in Farmington for Ozarks Electric	261
2 programs on 1/26/11 at Tyson Elementary in Springdale for Ozarks Electric	519
1 program on 1/28/11 at Lake Hamilton Primary for First Electric	587
1 program on 1/28/11 at Lake Hamilton Elementary for First Electric	570
1 program on 2/14/11 at London Elementary for Arkansas Valley Electric	179
1 program on 2/15/11 at Westside Elementary in Hartman for Arkansas Valley	340
1 program on 2/16/11 at Mansfield Middle School for Arkansas Valley Electric	316
1 program on 2/17/11 at Booneville Elementary for Arkansas Valley Electric	783
1 program on 2/24/11 at Malvern Boys and Girls Club for First Electric	112
1 program on 3/10/11 at Scott Elementary for First Electric	206
1 program on 3/11/11 at Fountain Lake Elementary for First Electric	864
1 program on 3/14/11 at Mountainburg Elementary for Arkansas Valley Electric	277
2 programs on 4/25/11 at Mountain Springs Elementary for First Electric	185
1 program on 4/25/11 at Northside Elementary for First Electric	520
1 program on 4/25/11 at Jacksonville Charter School for First Electric	80
2 programs on 4/26/11 at Westside Elementary in Cabot for First Electric	481
1 program on 4/26/11 at Magness Creek Elementary for First Electric	539
1 program on 4/27/11 at Ellen Smith Elementary for First Electric	461
1 program on 4/28/11 at AECC for Bring Your Son/Daughter to Work Day	30
1 program on 4/29/11 at Billy Mitchell Boys Club for First Electric	50
2 programs on 5/2/11 at Clinton Primary in Hope for SWREA	1062
1 program on 5/2/11 at Springhill Elementary for SWREA	549
1 program on 5/3/11 at Nashville Primary for SWREA	753
1 program on 5/3/11 at Nashville Elementary for SWREA	418
1 program on 5/4/11 at Fouke Elementary for SWREA	546
1 program on 5/4/11 at Lafayette County Elementary for SWREA	431
1 program on 5/6/11 at Saratoga Elementary for SWREA	111
1 program on 5/6/11 at Mineral Springs Elementary for SWREA	213
1 program on 5/6/11 at Lockesburg Elementary for SWREA	184
1 program on 5/9/11 at Taylor Elementary for SWREA	174
1 program on 5/9/11 at Bradley Elementary for SWREA	209
1 program on 5/10/11 at Union Elementary for SWREA	280
1 program on 5/10/11 at Trinity Christian Elementary for SWREA	340
4 programs on 5/11/11 at Genoa Elementary for SWREA	387
1 program on 5/12/11 at Horatio Elementary for SWREA	448
1 program on 5/12/11 at Foreman Elementary for SWREA	268
1 program on 5/13/11 at DeQueen Elementary for SWREA	505
1 program on 5/13/11 at Wickes Elementary for SWREA	324
1 program on 5/23/11 at Nelson Wilkes Elementary for North Arkansas Electric	925

1 program on 5/24/11 at Eagle Heights Elementary for Carroll Electric	230
2 programs on 5/25/11 at Pea Ridge Elementary for Carroll Electric	740
2 programs on 5/25/11 at Eastside Elementary for Carroll Electric	554
2 programs on 5/26/11 at Bonnie Grimes Elementary for Carroll Electric	570
1 program on 5/27/11 at Mathias Elementary for Carroll Electric	527
1 program on 5/27/11 at Mary Mae Jones Elementary for Carroll Electric	648
1 program on 5/31/11 Lakeside Middle School for First Electric	690
1 program on 6/2/11 at Mountain Home Elementary for North Arkansas Electric	320
1 program on 7/25/11 at Directors Conference for AECC	100
2 programs on 8/29/11 at University Heights Elementary for Craighead Electric	387
2 programs on 8/29/11 at Micro-Society Elementary for Craighead Electric	485
2 programs on 8/30/11 at Harrisburg Elementary for Craighead Electric	446
2 programs on 8/30/11 at Riverside Elementary for Craighead Electric	263
2 programs on 8/31/11 at Cedar Park Elementary for Craighead Electric	719
3 programs on 8/31/11 at Fox Meadow Elementary for Craighead Electric	534
1 program on 9/1/11 at BIC West Elementary for Craighead Electric	220
1 program on 9/1/11 at Nettleton Intermediate for Craighead Electric	389
1 program on 9/2/11 at BIC East Elementary for Craighead Electric	274
4 programs on 9/2/11 at Brookland Elementary for Craighead Electric	844
2 programs on 9/7/11 at SAU Tech for Ouachita Electric	120
1 program on 9/7/11 at Harmony Grove Elementary for Ouachita Electric	434
2 programs on 9/8/11 at Hermitage Elementary for Ouachita Electric	263
1 program on 9/9/11 at Arkadelphia Rotary for South Central Electric	55
1 program on 9/14/11 at Park Elementary for Clay County Electric	283
2 programs on 9/15/11 at Central Elementary for Clay County Electric	313
2 programs on 9/16/11 at Maynard Elementary for Clay County Electric	280
1 program on 9/16/11 at Alma Spikes Elementary for Clay County Electric	468
1 program on 9/23/11 at Jacksonville Homeschool Day at First Electric	157
1 program on 10/3/11 at Lavaca Elementary for Arkansas Valley	378
2 programs on 10/3/11 at Scranton Elementary for Arkansas Valley	226
1 program on 10/4/11 at Clarksville Rotary for Arkansas Valley	22
1 program on 10/4/11 at Oark Elementary for Arkansas Valley	83
1 program on 10/5/11 at Clarksville Primary for Arkansas Valley	502
2 programs on 10/5/11 at Ozark Kindergarten for Arkansas Valley	148
2 programs on 10/6/11 at Museum of Discover for First Electric	75
2 programs on 10/7/11 at Museum of Discover for First Electric	60
3 programs on 10/8/11 at Museum of Discover for First Electric	45
3 programs on 10/10/11 at Greene County Tech Elem. for Craighead Electric	875
2 programs on 10/10/11 at Black Rock Elementary for Craighead Electric	176
2 programs on 10/11/11 at Ridgefield Christian for Craighead Electric	354

1 program on 10/11/11 at Concordia School for Craighead Electric	52
1 program on 10/11/11 at Marmaduke Elementary for Craighead Electric	454
2 programs on 10/12/11 at Manila Elementary for Craighead Electric	432
1 program on 10/12/11 at Blessed Sacrament for Craighead Electric	139
1 program on 10/13/11 at Valley View Primary for Craighead Electric	1349
1 program on 10/13/11 at Earle Elementary for Craighead Electric	309
1 program on 10/14/11 at Riverside East Elementary for Craighead Electric	202
1 program on 10/14/11 at Tyronza Elementary for Craighead Electric	232
1 program on 10/14/11 at Lepanto Elementary for Craighead Electric	242
1 program on 11/7/11 at Blue Eye Elementary for Carroll Electric	204
2 programs on 11/7/11 at Watson Elementary in Huntsville for Carroll Electric	458
2 programs on 11/8/11 at Central Park Elementary for Carroll Electric	760
2 programs on 11/8/11 at Elm Tree Elementary for Carroll Electric	646
1 program on 11/9/11 at Berryville Elementary for Carroll Electric	506
1 program on 11/9/11 at Forest Heights Elementary for Carroll Electric	360
2 programs on 11/10/11 at Tucker Elementary for Carroll Electric	544
1 program on 11/10/11 at NWA Children's Shelter for Carroll Electric	12
1 program on 11/11/11 at Ozark Adventist School for Carroll Electric	99
2 programs on 11/11/11 at Lingle Middle School for Carroll Electric	747
1 program on 11/16/11 at Melbourne Headstart for North Arkansas Electric	20
1 program on 11/16/11 at Brockwell Headstart for North Arkansas Electric	24
1 program on 11/16/11 at Calico Rock Headstart for North Arkansas Electric	35
1 program on 11/17/11 at Viola Headstart for North Arkansas Electric	22
1 program on 11/17/11 at Salem Headstart for North Arkansas Electric	22
1 program on 11/17/11 at Highland Headstart for North Arkansas Electric	24
1 program on 11/18/11 at Peake Elementary for South Central Arkansas Electric	307
1 program on 11/18/11 at Central Elementary for South Central Arkansas Electric	313
Total	41751

Energy Efficient Home Makeover Project

About the program

Each Sunday night ABC airs an exciting reality show called "Extreme Home Makeover." It's a race against time on a whole home improvement project that would ordinarily take months to achieve. A team of designers, along with hundreds of workmen and neighbors, have just seven days to completely renovate an entire house, including every single room, the exterior and landscaping for a deserving family nominated by friends and family. Many of the home makeover recipients

have experienced catastrophic loss due to natural disasters or face some personal challenge.

AECC customized a similar format and created the "Electric Cooperatives of Arkansas Energy Efficiency Makeover" project. ECA members with all electric homes and who were in good standing with their local electric cooperative are qualified to submit an application. Print and television advertisements are used to promote the contests. Print ads are placed in Rural Arkansas magazine, and thirty-second television energy efficiency advertisements with the makeover contest details are aired over statewide television networks. Applicants are required to complete an on-line for printed entry form listing general information about the home, each energy component within their dwelling, then attach a copy of their electric bill and a photograph of their home.

2011 marked the third year for this successful educational project. Approximately 2,000 applications were received from May-July. Finalists were chosen from each of the 17 distribution cooperatives. The field was narrowed down to three remaining applicants from a comprehensive and objective selection process. The three semi-finalists received a thorough energy audit of their homes and the winner was chosen from First Electric Cooperative.

The 2011, makeover project was a huge success and was featured in the September and October editions of *Arkansas Living* magazine. The educational aspect was phenomenal and the earned media coverage exceeded our expectation. AECC continues to receive earned media from all three projects. Civic and service clubs and homebuilder's associations continue to request presentations on the makeover project.

AECC proposes a similar project for 2012, following similar work plans that incorporate refurbishing the home, incorporating energy saving components and measures.

Details including the application, television spots, print ads and more can be reviewed at: <http://www.aecc.com/energy-efficiency/energy-efficiency-makeover/>

Performance Details from the 2011 Makeover Project

The 2011, makeover project was a small, 40 year old, 1,400 square foot FHA ranch-style dwelling. The home had a mismatched HVAC system and the backup heat strips were partially functional. The thermal barrier was in poor condition to non-existent. The windows were in poor condition and the duct supply and return system had over 1-ton of tested leakage. Interestingly, the air-infiltration was not too bad and tested near 50%. Electric bills were averaging \$225 and much higher

during seasonal summer and winter months. AND...the home was heated with firewood!

The makeover consisted of a complete air-infiltration reduction package, insulation, new energy-efficient windows, Energy Star appliances, geothermal heat pump and a high-efficiency Marathon water heater. The combination of components and measures transformed the house into an energy efficiency marvel.

The comfort level of the home improved dramatically and the HVAC system is averaging an operating cost of \$1.10 daily. The water heater is averaging \$.50 daily. The overall average electric bill was reduced by sixty percent. Plus, the humidity levels are averaging 45-50 percent.

The 2011 Makeover

The 2011 winner was located in the small community of Hopewell in Cleburne County. Qualified AECC and distribution cooperative personnel diagnosed the home and recommend applicable energy components and measures.

A blower door test was administered for pre and post-analysis purposes. The pre-makeover air-infiltration tested at .50 ACH. Post-makeover blower-door test revealed fifty percent reduction of .25 ACH.

Infrared thermal imaging technology was implemented by trained thermographers during the pre- and post analysis.

Energy Components and Measures

The home was built in the early 1970's and consisted of little or no energy-efficient characteristics. Thus, the following energy-efficient components and measures were implemented:

1. Insulated the roof decking within the attic with bio-based open-cell foam. Also foamed the gable ends.
2. Insulated the crawl space with open-cell insulation.
3. Replace the windows with Low-E and U-value vinyl framed units.
4. Replaced old appliances with Energy Star units (Range, refrigerator, freezer, dishwasher, washer & dryer)
5. Installed Water Furnace Envision Geothermal ultra-efficient heat pump.
6. Installed high-efficiency Marathon water heater.
7. Converted lighting to CFL.
8. Installed new energy-efficient storm doors
9. Caulked and seal all accessible areas of air infiltration.
10. Caulked and seal inside building envelope.

11. Installed foam gaskets around all light switches and outlets.
12. Removed fireplace and sealed chimney.

Performance is still being monitored. Currently, the kwh consumption is averaging 50% to 60% lower following the makeover improvements.

Project Budget

2011 Energy Efficiency Makeover Expenses

Name	Description	Amount
BPSI	Foam Insulation	7,210.00
Buckman Well Drilling	Geo Wells & Loops	3,300.00
Rood HVAC	HVAC Install-Geo Fuse	2,094.05
General Electric	Energy Star Appliances	3,856.19
Wilco Siding & Gutters	Siding & Gutters	6,928.00
Max Allen	Bed to replace water bed	1,086.25
Doug Evans	Landscape	531.34
FECC	GenerLink Device	1,582.09
FL Davis	Building Materials	3,687.69
Straight Line Roofing	Roofing Labor	1,200.00
Lowes	Building Materials	3,448.16
Home Depot	Building Materials	561.81
Lawson Shutters	Shutters	276.15
Mt. Top Water	Rural Water	850.00
Total		36,611.73

Donated Materials for Makeover:

- 17, 40-gallon Marathon water heaters. One for the makeover project and one each for the 16 finalists
- Water Furnace-Envision geothermal heat pump
- WeatherBarr energy efficient window

Public Service Commission Docket 06-004-R

In Order No. 12 issued in Docket No. 06-004-R, the Arkansas Public Service Commission (the "Commission") called for utilities to take actions jointly with the Arkansas Economic Development Commission-Energy Office (the "AEO") to design, construct, and fund a statewide education program that has a consistent message promoting the efficient use of electricity and natural gas.

Pursuant to this action, the AEO and the participating utilities (collectively, the "Parties") entered into a Memorandum of Understanding (the "First MOU"), which set forth the elements of a statewide education program that was named ENERGY EFFICIENCY ARKANSAS ("EEA"). The EEA's purpose is to communicate and promote fuel neutral, cost effective energy efficiency information and programs. The Parties agreed that the EEA would be funded by the participating utilities and administered by the AEO.

The Parties jointly filed the first MOU for the Commission's approval on July 2, 2007, in Docket No. 07-083-TF. The EEA Program proposed in the first MOU had programs and associated activities based on a total proposed budget of approximately \$1.2 million. On September 19, 2007, the Commission issued Order No. 4 in Docket No. 07-083-TF, which directed the Parties to revise and refile the EEA Program plan with the Commission based on a total budget of \$2.4 million. Consequently, the Parties entered into an amended MOU, which was approved by the Commission in Order No. 5, in Docket No. 07-083-TF, on November 16, 2007.

AECC's contribution to the EEA program in from January 1, 2009 through June 30, 2010 was \$246,784. The prorated amount through June 2010 was \$82,261 and the contribution for July 1, through December 31, 2010, was \$ 95,605. A total of \$177,866 was contributed in 2010. AECC contributed \$112,463 in 2011. (Exhibit Fourteen)

AECC's contribution to the Frontier Deemed Savings report in 2011 was \$17,307. (Exhibit Fifteen)

Energy Efficiency Program Expenditures

2011 Expenditures for Energy Efficiency Programs & Services

Description	Expenditure
AECC Web Maintenance for EE	\$11,400.00
Apogee Online Energy Suite/Calculators	\$54,100.00
Doug Rye's Home Remedies Radio Show Sponsorship	\$106,258.00
Doug Rye Consulting Services	\$75,000.00
Marathon Water Heater Advertising	\$11,000.00
Arkansas Living EE Print Advertisement	\$21,984.00
Arkansas Living Makeover Print Advertisement	\$7,669.00
2011 Makeover/Promotional Ideas	\$3,515.00
2010 Makeover Project Expenses	\$36,612.00
General EE Ads, Makeover Creative and Placement, Calendars, Misc EE Advertising/Education	\$359,135.00
Commercial & Industrial Energy Audits	\$11,700.00
Contribution to EEA Program-AR Energy Office	\$112,463.00
Deemed Savings Report Contribution/Frontier	\$17,307.00
Kansas Building Institute/BPI Training & Certification	\$22,275.00
FLIR Training & Certification	\$17,000.00

Civic-Magic of Energy Efficiency Educational Shows	\$3,900.00
Arkansas HVACR	\$200.00
Rock River/Roby Brock/Talk Business/EE Ad	\$12,000.00
Safety and The Magic of Energy Efficiency Educational Shows	\$50,896.00
Total	\$934,414.00

AECC's Demand Response

The Electric Cooperatives of Arkansas, consisting of Arkansas Electric Cooperative Corporation ("AECC") and its seventeen member cooperatives¹, have been the most aggressive and successful utility system in the nation with regard to offering and implementing demand response programs.

The Electric Cooperatives' success in demand response has been achieved through many years of steady effort. In 1978, certain member cooperatives began using clock timer switches to control water heaters and irrigations loads. Clock switches were eventually replaced by radio-controlled load switches. As demand response became more prevalent, a statewide System Control and Data Acquisition ("SCADA") system was installed to provide the Electric Cooperatives with more sophisticated and timely load data. The receipt of virtually instantaneous data allowed the Electric Cooperatives to more surgically direct their demand response efforts.

The Electric Cooperatives continue to maintain their state-of-the-art approach to demand response by using the Internet to directly provide participating commercial and industrial ("C&I") retail consumers with current, minute-by-minute, AECC load data. This data allows participating C&I consumers to better choose how to operate their businesses during peak summer periods.

To encourage demand response, the Electric Cooperatives have maintained rates and charges that closely adhere to their cost of service. These rates and charges provide the economic incentives for retail consumers to voluntarily participate in demand response.

Perhaps the SPP Report best summarized the Electric Cooperatives' approach when it stated: "The very high penetration levels of demand response in Arkansas cooperatives can be traced to three factors: (i) long-term stability in the type of price signals sent; and (ii)

¹ Arkansas Valley Electric Cooperative Corporation; Ashley-Chicot Electric Cooperative, Incorporated; C&L Electric Cooperative Corporation; Carroll Electric Cooperative Corporation; Clay County Electric Cooperative Corporation; Craighead Electric Cooperative Corporation; Farmers Electric Cooperative Corporation; First Electric Cooperative Corporation; Mississippi County Electric Cooperative, Inc.; North Arkansas Electric Cooperative, Incorporated; Ouachita Electric Cooperative Corporation; Ozarks Electric Cooperative Corporation; Petit Jean Electric Cooperative Corporation; Rich Mountain Electric Cooperative, Incorporated; South Central Arkansas Electric Cooperative, Incorporated; Southwest Arkansas Electric Cooperative Corporation; and Woodruff Electric Cooperative Corporation

sufficient bill savings potential to gain active customer participation and interest; and (iii) avoiding over-payment of incentives, so there is sufficient savings for participants, non-participants, and utility management.”

A complete report is attached.

Exhibit 1

Certificate of Excellence

is awarded to

Bret Curry

who has successfully completed a comprehensive
evaluation and is certified as a

Building Analyst Professional

as of August 31, 2010

Expires: 08 31 2013



Larry Zarker
Chief Executive Officer



Mathew Anderson
Manager of Certifications

BUILDING PERFORMANCE INSTITUTE, INC.

CERTIFICATE OF ATTENDANCE

THIS IS TO CERTIFY THAT

BRET CURRY

HAS ATTENDED

**THERMAL IMAGING FOR ENERGY AUDITS
CERTIFICATION
FEBRUARY 8-11, 2010**



**INERARED
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CENTER**

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APPROVED BY RESNET FOR 32 CONTINUING EDUCATION CREDITS
BPI RECOGNIZED FOR 16 CEU CREDITS.



REGISTERED
TRAINING



Residential Energy Services Network

A handwritten signature in black ink, appearing to read 'D. Curry', is written over a horizontal line.

INSTRUCTOR

PI 8 ITC 129 B 2009-09-28

Exhibit 2



Building Design Services, Inc.

electrical, mechanical, plumbing, energy design consultants

Barry G. Ferguson John W. Reed

144 Professional Drive, Suite 1

Cabot, AR 72023 (501)843-1553 Fax: (501)843-1566

bdsmc@bdsenergy.com www.bdsenergy.com

January 31, 2011

Kirkley Thomas
Electric Cooperatives of Arkansas
1 Cooperative Way
P.O. Box 194208
Little Rock, AR 72219-4208

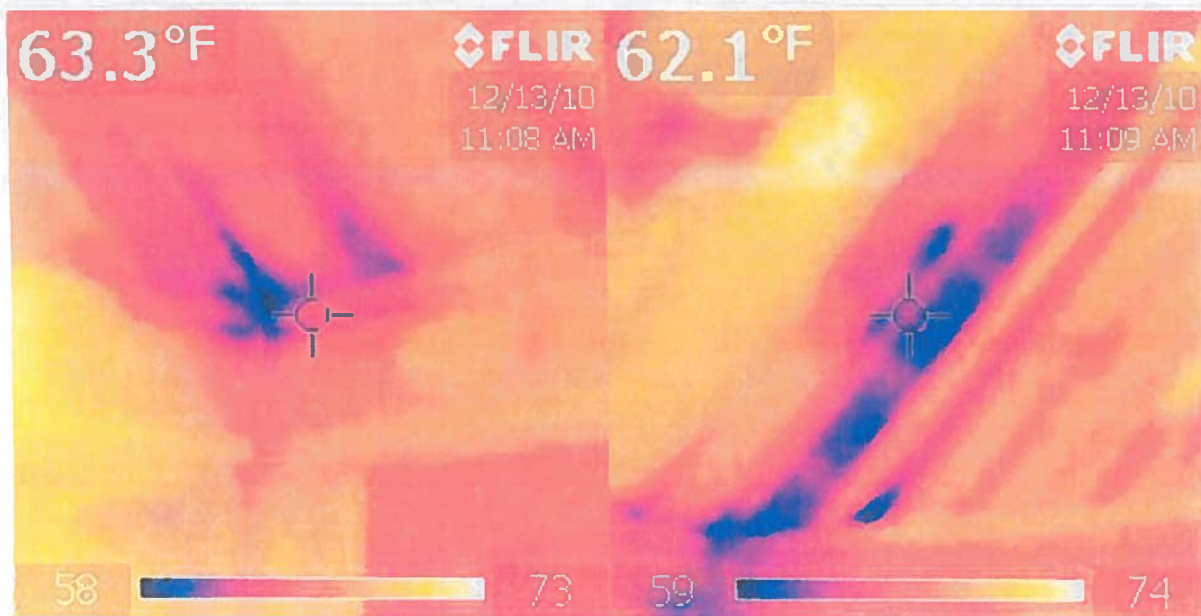
Re: [REDACTED] – Amity, AR

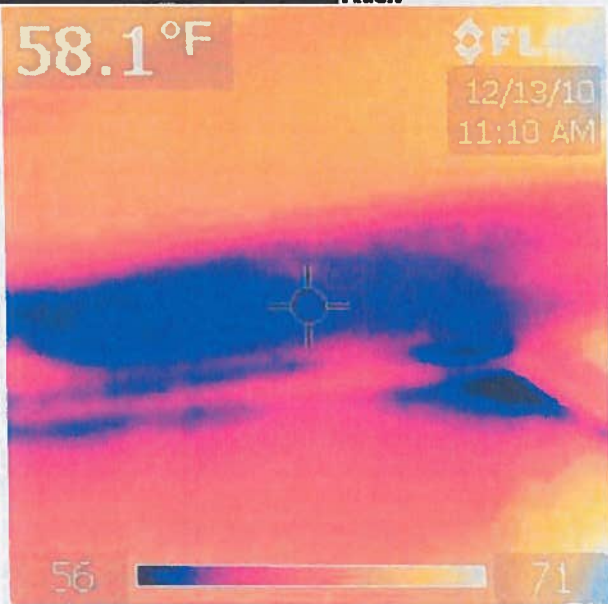
Dear Kirkley:

Survey

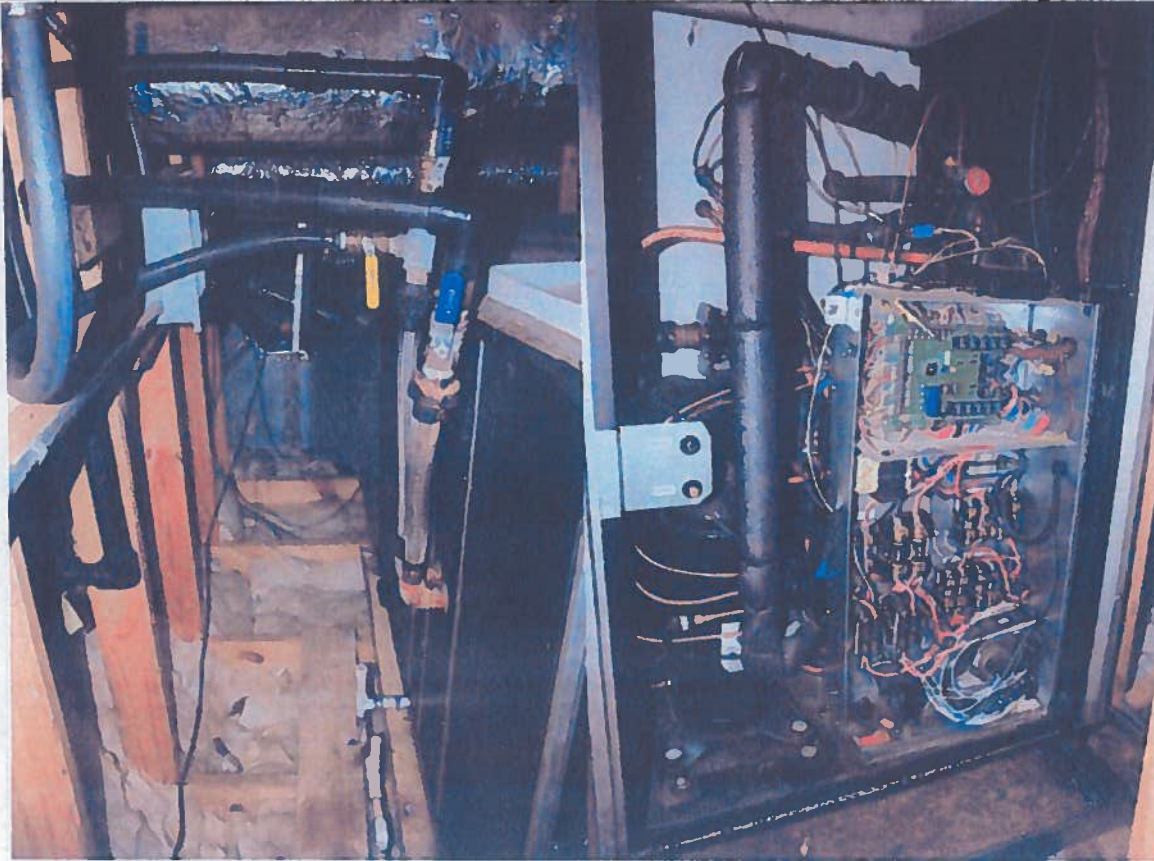
On December 13, 2010 I made a survey of the facility along with [REDACTED] and yourself.

The building is wood frame construction with a ventilated attic and gypboard ceilings. It is heated with a geo-exchange heat pump system. The facility was built in 2004. Mr. [REDACTED] reported that the geo system has never cooled the building properly during the summer. The facility is about 7000 square feet. The building seems to be fairly tight, but has some areas of the attic insulation that have been disturbed, allowing cold spots to form on the ceiling. See the Flir images below. Because the geo system has multiple problems this audit will focus primarily on the equipment problems.





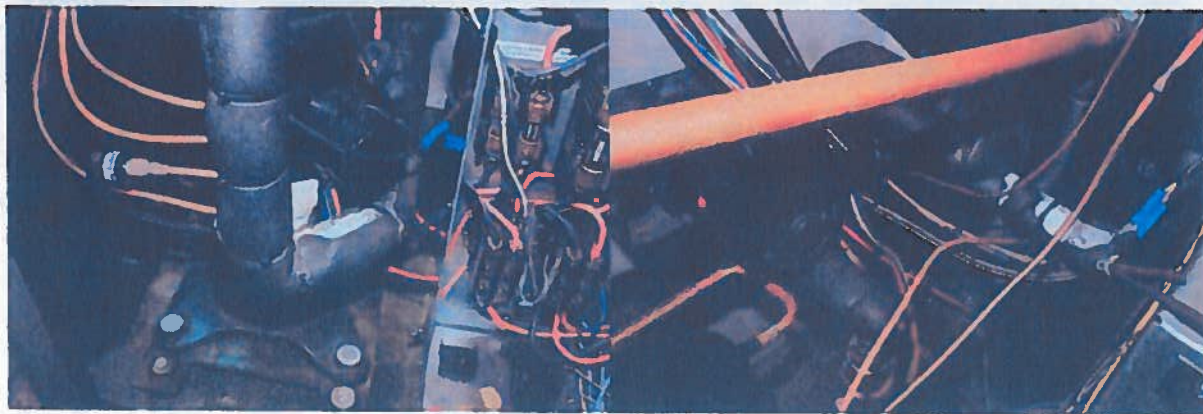
The attic has rock-wool blown in insulation that is about 8" thick. An additional 4" layer of cellulose would greatly enhance the R-Value of the ceiling insulation system and would act as a seal for the rock-wool.



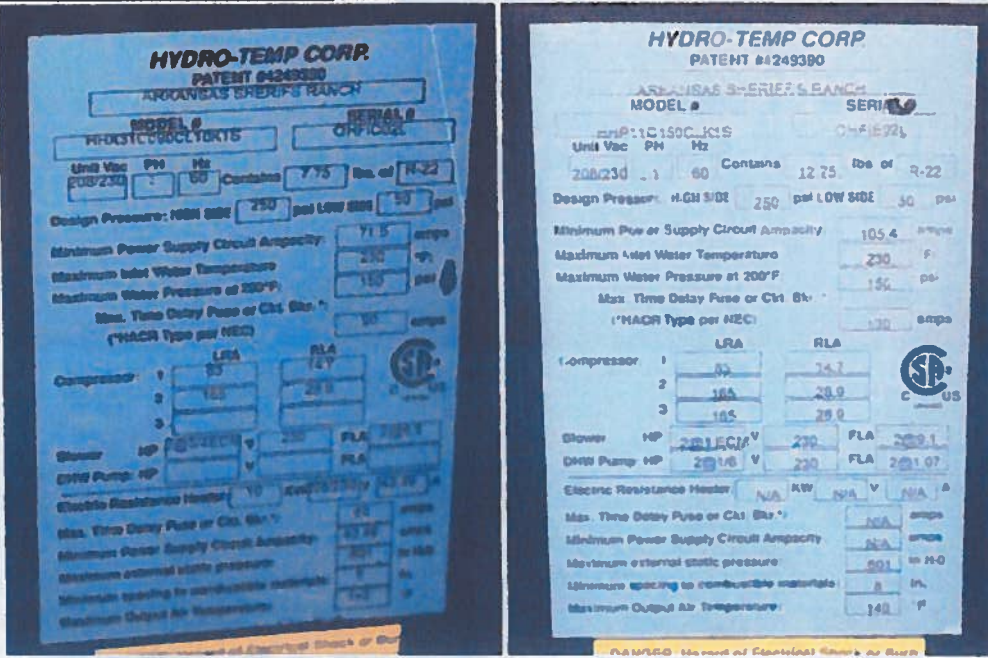
The geo-exchange system has been worked on multiple times by the manufacturer, all access doors were left open as shown. At the time of the survey only one machine was working at all and it was not putting out warm air.



There was evidence of compressor overloads, requiring multiple fuses to be replaced.



Only one unit was operating. The refrigerant lines were frozen indicating that the unit was not absorbing heat from the water loop.



One machine is 7.5 tons, one is 12.5 tons. This is roughly 350 square feet per ton, which is about right for this type of facility. The larger machine was completely turned off, so I was unable to determine if it was working. The smaller machine was running, but did not appear to be producing warm air.



At least one of the reasons soon became apparent as to why the system was not working. Apparently the loop water has leaked out. The pictures above show the filler bucket/ air-separator was completely

empty!



The geo-exchange loop is a closed lake loop. A closed loop of poly pipe is submerged in the lake and uses the lake water as a heat sink, drawing heat out of the lake in winter and rejecting heat in the summer. Unfortunately the lake level has fallen and exposed the loop, so that even if the loop had water it may have frozen and certainly doesn't have full capacity. Only about 25% of the loop is currently underwater.

Correcting the System

Because there are multiple problems with this system it is hard to see how it can be salvaged as it is. Even if the heat pumps were repaired, there is still the problem of the low lake level. Also why did the water leak out? Did the pipes freeze and burst, letting out all the loop water? According to Mr. Fortner the staff has had to put water in the filler bucket many times in the past, so the leak has gone on for a long time. He also reports that the system has never worked properly since opening in 2004. Currently there is virtually no heat from the system and he is heating the building with a fireplace and plug-in space heaters.

Probably the best solution would be to remove the geo-exchange heat pumps and replace them with air-to-air units of the same size. There are large louvers on the end of the building that may be large enough to remove the units. The most straight forward solution would be to replace the geo-exchange units in the attic with new split system air handlers. New heat pump condensing units could be added outside to serve the new air handlers. The air handlers would need to have back-up electric heat strips. The circuits serving the geo units are probably large enough to supply this load. This leaves the outdoor condensing units.

The electrical service is 400 amp single phase 120/240 volt. This is probably not large enough to supply both the air-handlers with strip heat and the outdoor condensing units. A second 200 amp main lugs only panel needs to be added next to the 400 amp switch shown. This panel would contain two breakers that would feed the condensing units. The circuits could be routed underground around the back of the building to the condensing unit locations. This would give the facility 3 main disconnects in-lieu of just one, but this is allowed by the National Electrical Code. The second panel would be fed directly from the existing pad-mount transformer located nearby. South Central Arkansas Electric Coop needs to verify if the small single phase transformer can carry the additional load.



Since the existing ductwork can be reused only the equipment itself would have to be replaced. The installed cost of the new condensing units and air handlers is approximately \$50,000. The electrical cost to add the panel and circuits for the outside condensing units is another \$5000. I would recommend that the owner retain an engineer to produce bid documents so that all details of the project can be fully coordinated and the project could be bid if desired.

The building appears to be fairly tight and well-constructed, so if the heating and cooling issues were resolved I believe it would be a fairly energy efficient facility. Of course geo-exchange is a wonderful system and practically nothing can beat it for energy efficiency. Unfortunately since the lake loop is proving to be problematic keeping the geo-system would involve drilling wells and using a more conventional vertical loop. This would cost substantially more than the air-to-air heat pumps noted above and the payback would be over 10 years for a facility of this type. Because of this I would recommend air-to-air heat pumps over geo.

Yours truly,

John W. Reed, PE, CEM

Exhibit 3



Building Design Services, Inc.

electrical, mechanical, plumbing, energy design consultants

Barry G. Ferguson John W. Reed

144 Professional Drive, Suite 1

Cabot, AR 72023 (501)843-1553 Fax: (501)843-1566

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February 17, 2011

Kirkley Thomas
Electric Cooperatives of Arkansas
1 Cooperative Way
P.O. Box 194208
Little Rock, AR 72219-4208

Re: An energy audit for [REDACTED]
[REDACTED], AR.

Dear Kirkley:

Survey

On December 1, 2010 I surveyed the facility along with you, [REDACTED] (the owner) and Monty Williams of Craighead Electric Coop. During the interview we discussed the following:

1. The store is open 6 days a week and is open 8am to 8 pm.
2. The building is 10,200 square feet.
3. Some of the refrigeration dates from 1978 and some was replaced in 1997.
4. Most of the refrigeration is accomplished by "Stand Alone" cases, some with indoor condensers and some with outdoor condensers. The store does not use a central refrigeration system.
5. The building is heated with natural gas.
6. In July the building began to use significantly more electricity. The owner felt that this was caused by a change in how the store is operated and hotter weather.
7. The ceiling is lay-in with fiberglass batts on top, but there is also metal building type "blanket" insulation at the roof deck.
8. The building air-conditioning units are approximately 4 years old.
9. The dock doors are open 8 to 9 times per day.
10. The stockroom is heat only, no air conditioning.
11. The domestic water is heated by an electric water heater.

Following the interview I made the following observations:



Examined the refrigeration equipment, noting that some of the coils were dirty and needed cleaning.



The store lighting is the older T12 technology. As ballasts fail these should be converted to T8 lamps with electronic ballasts.



The case on the right has good seals and glass. The case on the left has a damaged seal that allows cold air to leak out on the floor.



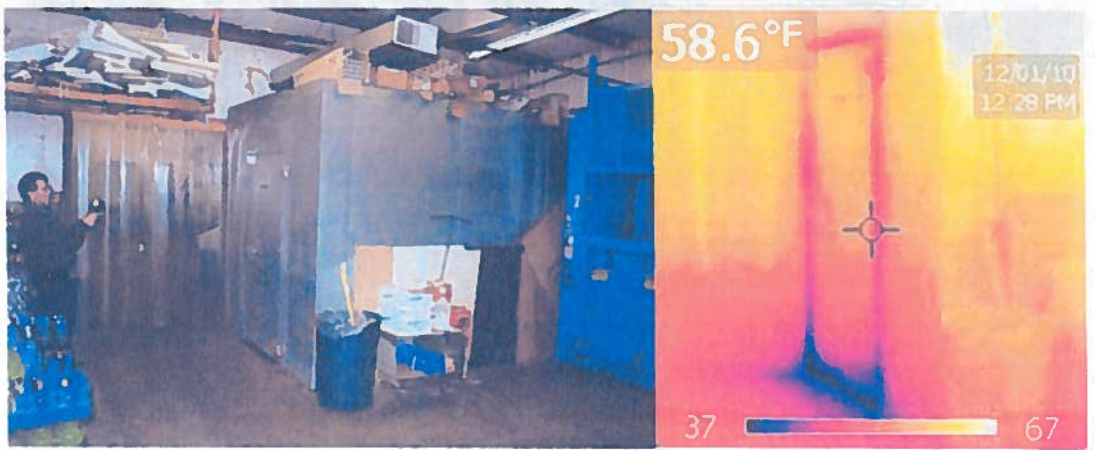
Case lighting is fluorescent.



One of the case doors has lost the seal between the double pane glass, letting heat transfer into the refrigerated interior.



The electric water heater appears to have a bad lower element so that hot water only resides near the top.



One of the walk-in freezers in the back had a damaged door, allowing cold air to leak at the bottom.



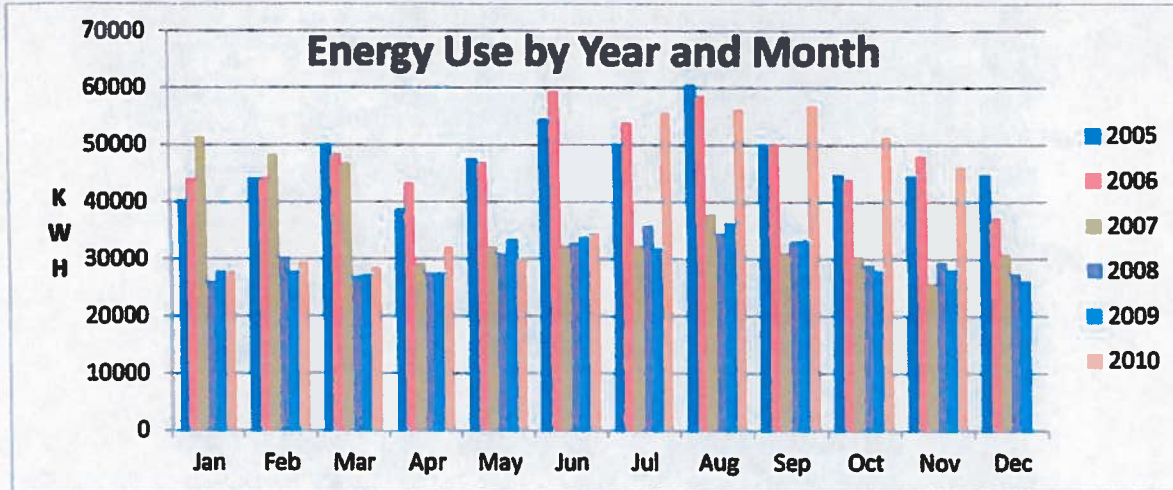
The door to the exterior walk-in was experiencing some leakage around the seals.



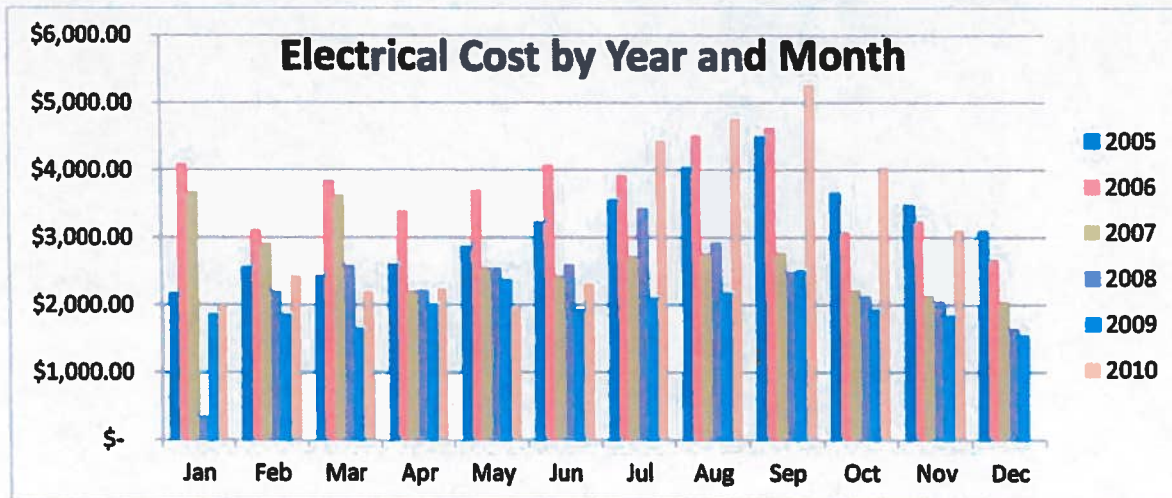
The space above the sales area ceiling is open to the stock room. Since the stockroom is unconditioned in the summer, this negates the batt insulation on the lay-in ceiling.

Electrical Utility History

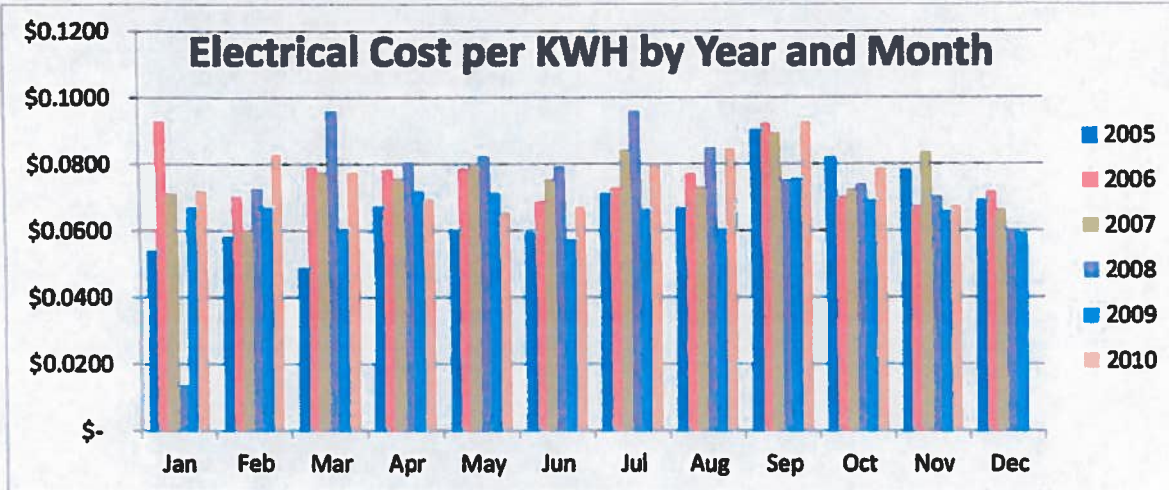
I acquired an electrical utility history for the facility going back to 2005 thanks to Monty Williams of Craighead Electric. Graphs of usage are as follows:



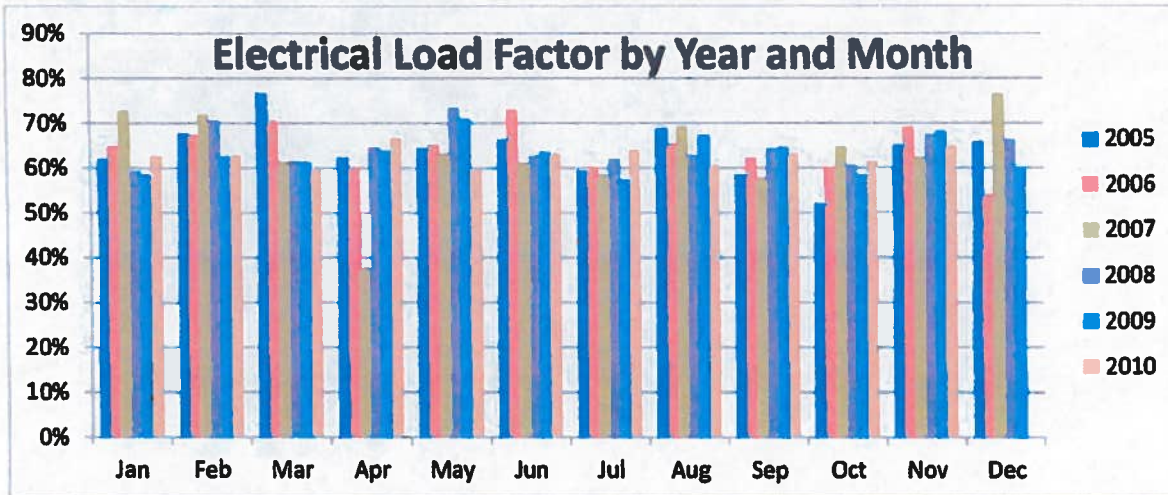
This is the raw electrical energy use in Kilowatt-hours. Apparently the building used to have heat-pumps that caused the winter usage to be higher in 2005-2007, but these were replaced with natural gas units in 2007. In July 2010 the summer usage took a big jump. While the owner believes that this is caused by a change in operation and hot weather, I'm not convinced that that is all there is to the problem.



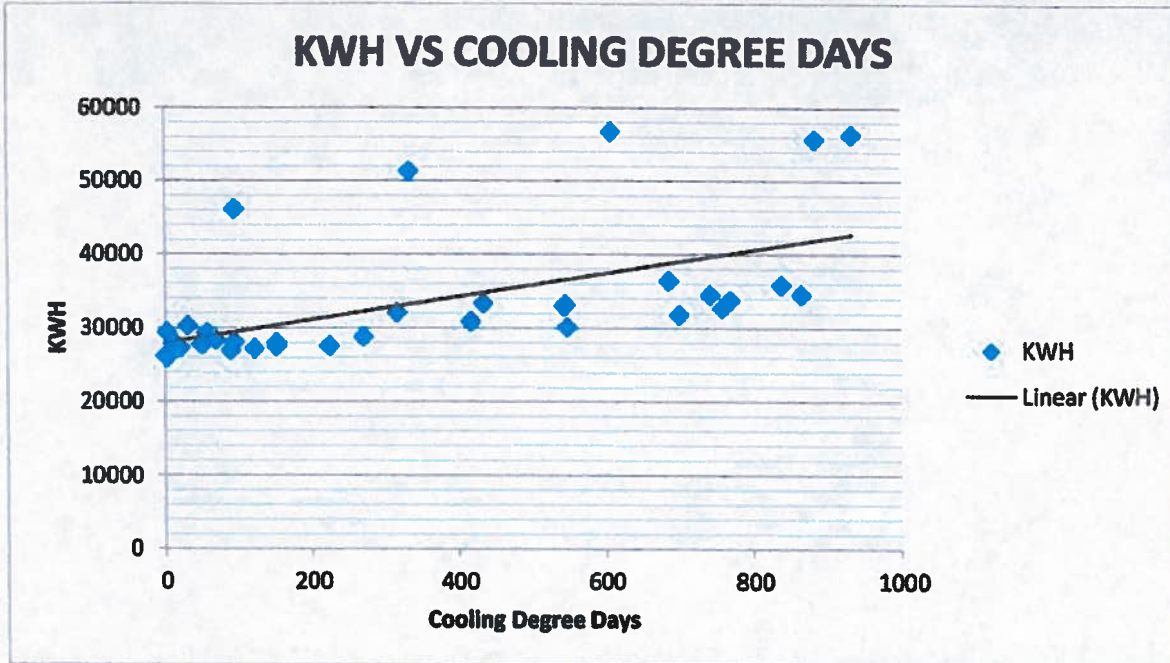
Replacing the air conditioners in 2007 reduced the summer costs by about \$1500 per month.



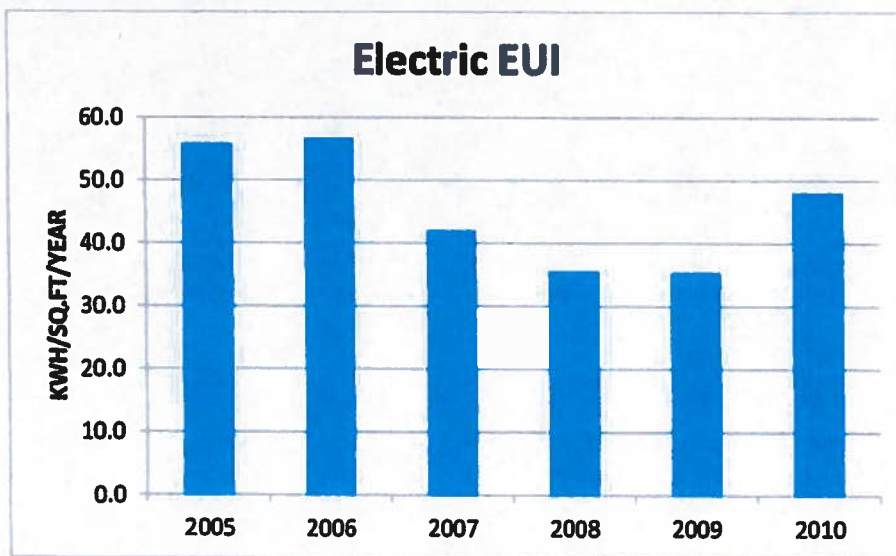
The per-unit cost of electricity has remained fairly constant over the past 6 years.



The electrical load factor is fairly high, which means that a lot of equipment is running day and night. Air-conditioning and lights can be set back or turned off at night. Obviously the refrigeration keeps running 24/7 which is a prime energy user for this facility.



This graph shows how the building responds to climate. As the cooling degree days increase due to more and warmer days the facility very gradually uses more electrical energy. This response is really pretty flat compared to other types of buildings and shows that the building's energy usage is dominated by the refrigeration rather than air conditioning. Also note that the July 2010 anomaly shows up, with these points much higher than the previous years.



The above graphs show the electrical utilization index (EUI) for the building. This is the electrical use per square foot per year. The EUI can now be compared to others similar buildings. I used the following web site to do this:

Commercial Buildings Energy Consumption Survey commercial energy uses and costs

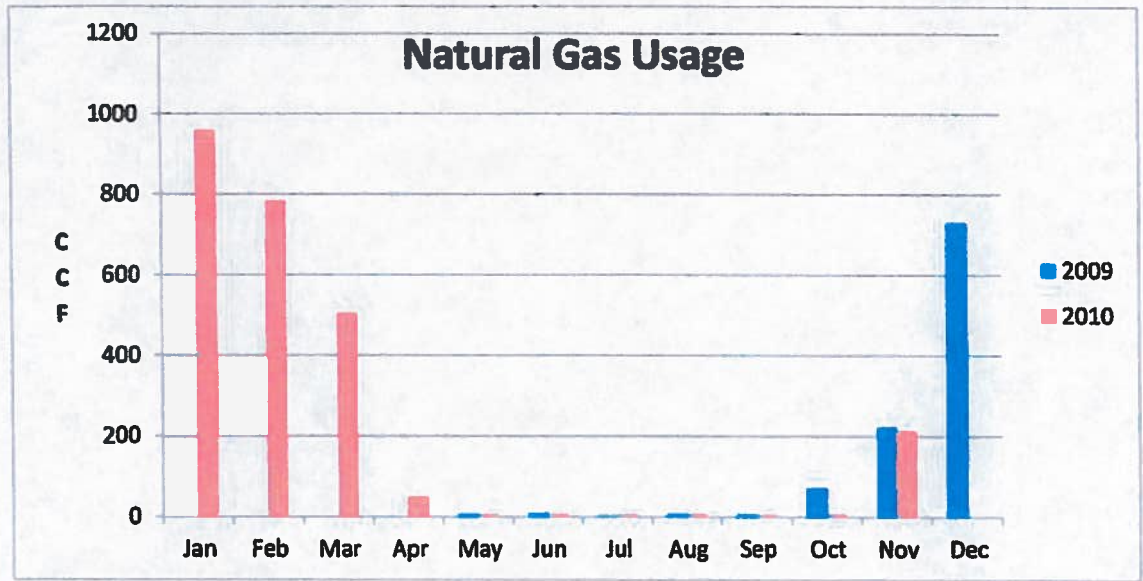
<http://www.eia.doe.gov/emeu/cbecs/>

Table C20. Electricity Consumption and Conditional Energy Intensity by Climate Zone^a for Non-Mall Buildings, 2003

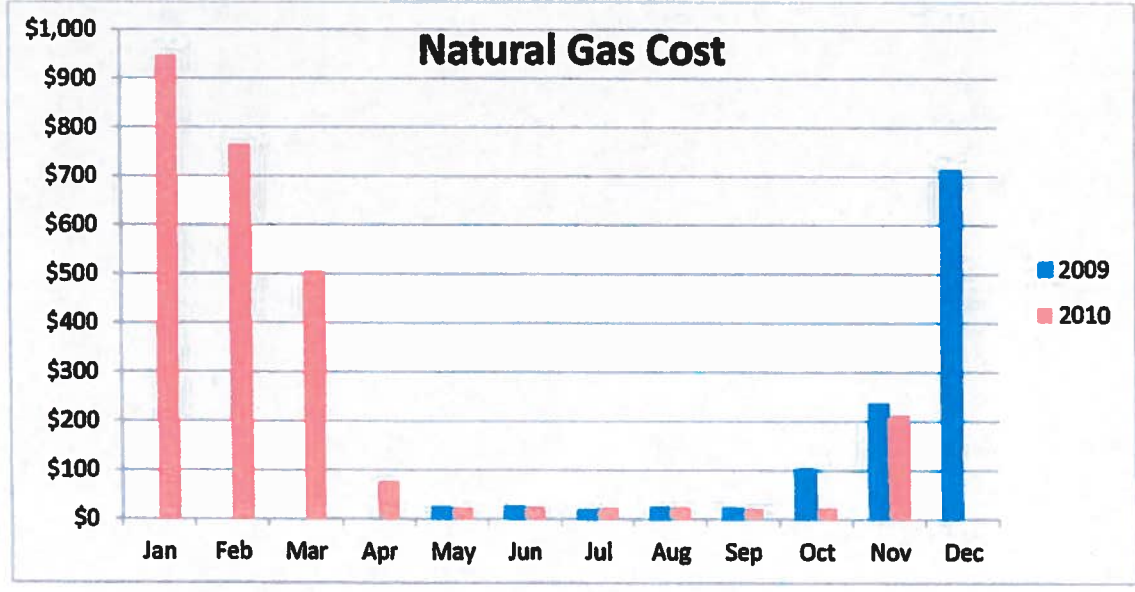
	Total Electricity Consumption (billion kWh)					Total Floorspace of Buildings Using Electricity (million square feet)					Electricity Energy Intensity (kWh/square foot)				
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Principal Building Activity															
Education	13	23	16	31	27	1,537	2,800	1,401	2,435	1,698	8.2	8.0	11.1	12.7	16.0
Food Sales	12	Q	Q	Q	Q	271	Q	Q	Q	Q	43.0	Q	Q	Q	Q
Food Service	7	12	Q	20	17	227	400	Q	440	366	29.3	30.6	Q	45.7	46.3
Health Care	10	18	11	20	14	475	784	564	844	496	20.6	23.3	19.2	23.7	27.6
Inpatient	6	12	8	17	9	262	450	323	592	278	23.7	27.7	23.3	28.2	34.0
Outpatient	4	6	3	3	Q	213	334	240	252	Q	16.7	17.4	13.7	13.4	Q
Lodging	8	21	12	18	10	768	1,314	1,132	1,275	808	10.1	15.9	Q	14.0	16.7
Retail (Other Than Mall).....	10	10	10	16	15	710	865	695	1,454	592	14.2	11.0	14.8	11.3	25.9
Office	22	58	53	39	38	1,593	3,165	3,125	2,341	1,985	13.9	18.2	17.1	16.8	19.2
Public Assembly	8	8	6	18	9	876	818	806	906	529	9.1	9.5	Q	19.7	17.0
Public Order and Safety	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Religious Worship	1	5	2	5	5	408	1,320	499	1,039	488	3.0	3.5	4.9	4.8	10.1
Service	10	11	Q	7	Q	911	1,179	639	946	Q	10.6	9.6	Q	7.6	Q
Warehouse and Storage	11	24	11	16	9	1,564	2,539	1,428	2,186	1,710	7.0	9.6	7.9	7.5	5.0
Other	Q	11	Q	Q	Q	Q	467	Q	Q	Q	Q	24.6	Q	Q	Q
Vacant	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q

At 48 KWH/sq.ft./Year the facility falls above the national average for Climate Zone 1 Food Sales. Climate Zone 4 (Arkansas) is not listed and would probably be higher than Zone 1 (which is a northern zone). While the facility is not too far above average, I think there is room for improvement. Also note that in 2009 it was only 35.4, which is really good. Apparently the facility has back-slid in 2010 with energy use increasing by 35%.

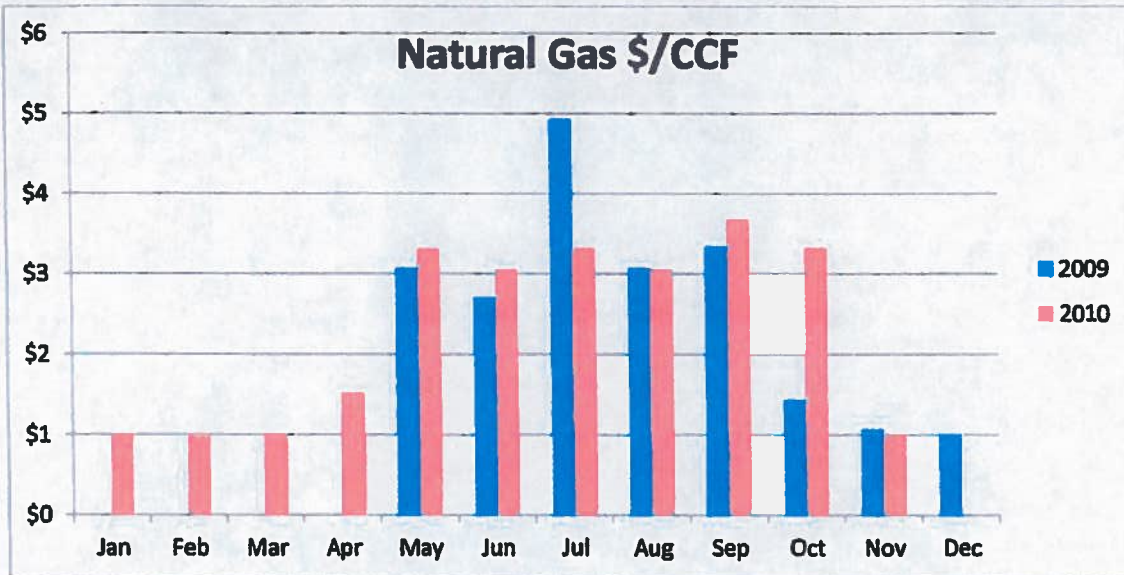
Natural Gas Utility History



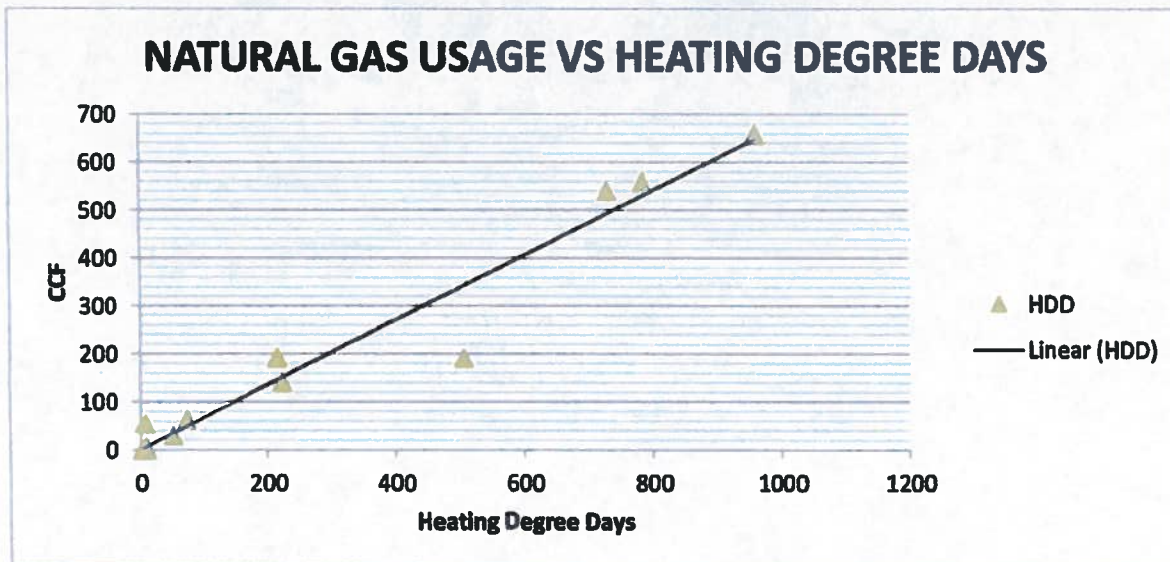
This graph shows that natural gas is used only for heat with little or no summer usage.



The summer shows only the minimum charge; very little actual gas was used in the summer.



The natural gas per unit charge has been running around 1\$/CCF except in the summer when the service connection charge dominates the bill.



The graph shows how the building responds to winter seasonal temperatures. The natural gas is used only for heating, so its use increases in a straight line as there are more and colder days.

The EUI for Natural Gas is 32CF/sq.ft./year for December 2009 thru November 2010. Consulting CBECS (below) the facility is above Mercantile for Zone 4. Apparently there is no data for Food Sales for Natural Gas. This higher number may be due to dock doors being open, but could also be due to the extra heat load caused by the refrigeration cases. Either way the gas is about 1/10th the electric bill, so my focus remains on electricity.

Table C30A. Natural Gas Consumption and Conditional Energy Intensity by Climate Zone^a for All Buildings, 2003

Principal Building Activity	Total Natural Gas Consumption (billion cubic feet)					Total Floorspace of Buildings Using Natural Gas (million square feet)					Natural Gas Energy Intensity (cubic feet/square foot)				
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Education	65	113	26	48	9	1,227	2,281	968	1,700	869	53.0	49.4	26.4	28.2	10.1
Food Sales	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Food Service	27	49	Q	64	31	174	368	Q	393	277	154.3	134.4	Q	161.9	110.9
Health Care	38	69	36	64	29	383	665	454	720	323	98.4	103.5	78.3	89.5	89.4
Inpatient	27	56	30	59	26	237	414	302	589	264	114.1	136.3	99.9	99.4	98.8
Outpatient	Q	12	Q	Q	Q	Q	251	Q	Q	Q	Q	49.4	Q	Q	Q
Lodging	34	86	36	34	18	609	1,183	958	967	538	55.5	72.8	Q	35.3	32.8
Mercantile	63	83	46	46	17	1,433	1,867	1,308	2,219	1,044	43.8	44.6	35.3	20.9	16.6
Retail (Other Than Mall)	27	27	16	16	Q	593	595	451	931	Q	46.1	45.8	36.1	17.0	Q
Enclosed and Strip Malls	35	56	30	30	Q	840	1,272	857	1,287	Q	42.2	44.1	34.9	23.7	Q
Office	60	106	60	22	14	1,252	2,575	1,977	1,539	865	48.0	41.0	30.1	14.4	16.1
Public Assembly	32	30	Q	25	Q	639	537	Q	700	Q	49.7	55.0	Q	35.4	Q
Public Order and Safety	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Religious Worship	14	38	14	13	Q	277	973	412	774	Q	49.2	38.9	32.8	16.5	Q
Service	49	37	18	23	Q	697	717	422	511	Q	70.9	52.1	Q	44.8	Q
Warehouse and Storage	33	44	33	16	Q	963	1,672	1,071	1,463	Q	34.5	26.4	30.7	11.2	Q
Other	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Vacant	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q

Summary

There are several items of possible energy improvement. The following is a list of my thoughts on this:

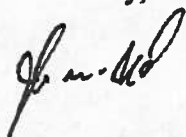
1. Clogged refrigeration coils should be cleaned first. Up until July 2010 refrigeration has been costing an average of \$2000 per month, lighting about \$500 per month and air conditioning up to \$500 per month in the summer months. So as you can see the biggest impact to the energy picture is the refrigeration. Let's say cleaning coils makes a 10% improvement over what it is now, this could save \$200 per month!
2. Leaky case doors and walk-in doors should also be checked as well. Even a 1% improvement would save \$20 a month. If there are very many doors with bad seals this number could be two or three times higher.
3. If the plenum above the lay-in ceiling were to be sealed, this would save about \$500 a year in air conditioning. This will also keep humidity out of the sales area which help comfort and helps the refrigeration by reducing required defrost.
4. Making sure the air-conditioning equipment is working properly and putting out properly dehumidified air can also help save on refrigeration as well as air-conditioner energy. Have all air conditioners checked for refrigerant charge and proper air flow. The discharge air should be no higher than 60 degrees.
5. Changing store lighting to T-8 lamps and electronic ballasts. If the entire store were converted from standard T12 with magnetic ballasts the savings would be about \$100 per month off the \$500 the store is currently using. Usually it is not feasible to group re-ballast and re-lamp a building unless the system is wore out and the lighting needs replacing anyway. But as ballasts and lamps

wear out replacing them with the newer technology will save on that portion.

6. Case lighting can be changed to LED. Replacing fluorescent case lighting with LED's can save about \$50 per door per year, allowing for a 1 to 2 year payback. LED lighting actually works better in cold temperatures, whereas fluorescent gets dimmer and uses the same energy. LED lighting also makes less heat for the refrigeration equipment to remove.
7. Now we come to the big July 2010 jump in energy cost. Looking at the monthly energy costs it appears that the increase has been fairly constant since July. Also the increase is higher than all the air-conditioning and lighting put together so it really can't be these systems. What this must mean is that some of the refrigeration equipment has a problem. The \$2000 part of the monthly bill due to refrigeration has become \$4000, so the cost has doubled. As noted in item 1 the equipment needs to be checked or replaced. In all likelihood a compressor is going bad or the refrigerant levels are low, causing the compressors to labor. Another possible problem is one of the systems is going into defrost too often, wasting a lot of energy. Clean and check all coils, check expansion valves, refrigerant levels, defrost function and timing etc. If the systems are corrected or replaced that extra \$2000 should go away, returning the facility to pre July 2010 levels.

As you can see there are several opportunities for saving energy. Please feel free to call if there are any questions.

Yours truly,



John W. Reed, PE, CEM

Exhibit 4



Building Design Services, Inc.

electrical, mechanical, plumbing, energy design consultants

Barry G. Ferguson John W. Reed

144 Professional Drive, Suite 1

Cabot, AR 72023 (501)843-1553 Fax: (501)843-1566

bdsmc@bdsmcenergy.com www.bdsmcenergy.com

April 28, 2011

Kirkley Thomas
Electric Cooperatives of Arkansas
1 Cooperative Way
P.O. Box 194208
Little Rock, AR 72219-4208

Re: An energy audit for [REDACTED]
Clinton, AR.

Dear Kirkley:

Survey

On November 4, 2010 I surveyed the facility along with you, Dale Smith of Petit Jean Electric Coop and the owner. During the interview we discussed the following:

1. The building was built in 1974.
2. The hours of operation are from 6am to 9pm 7 days a week.
3. The refrigeration runs 24 hours per day.
4. Most of the refrigeration is 30 years old.
5. The building has natural gas heating.
6. The refrigeration compressors are an old style and don't un-load properly during part load times.

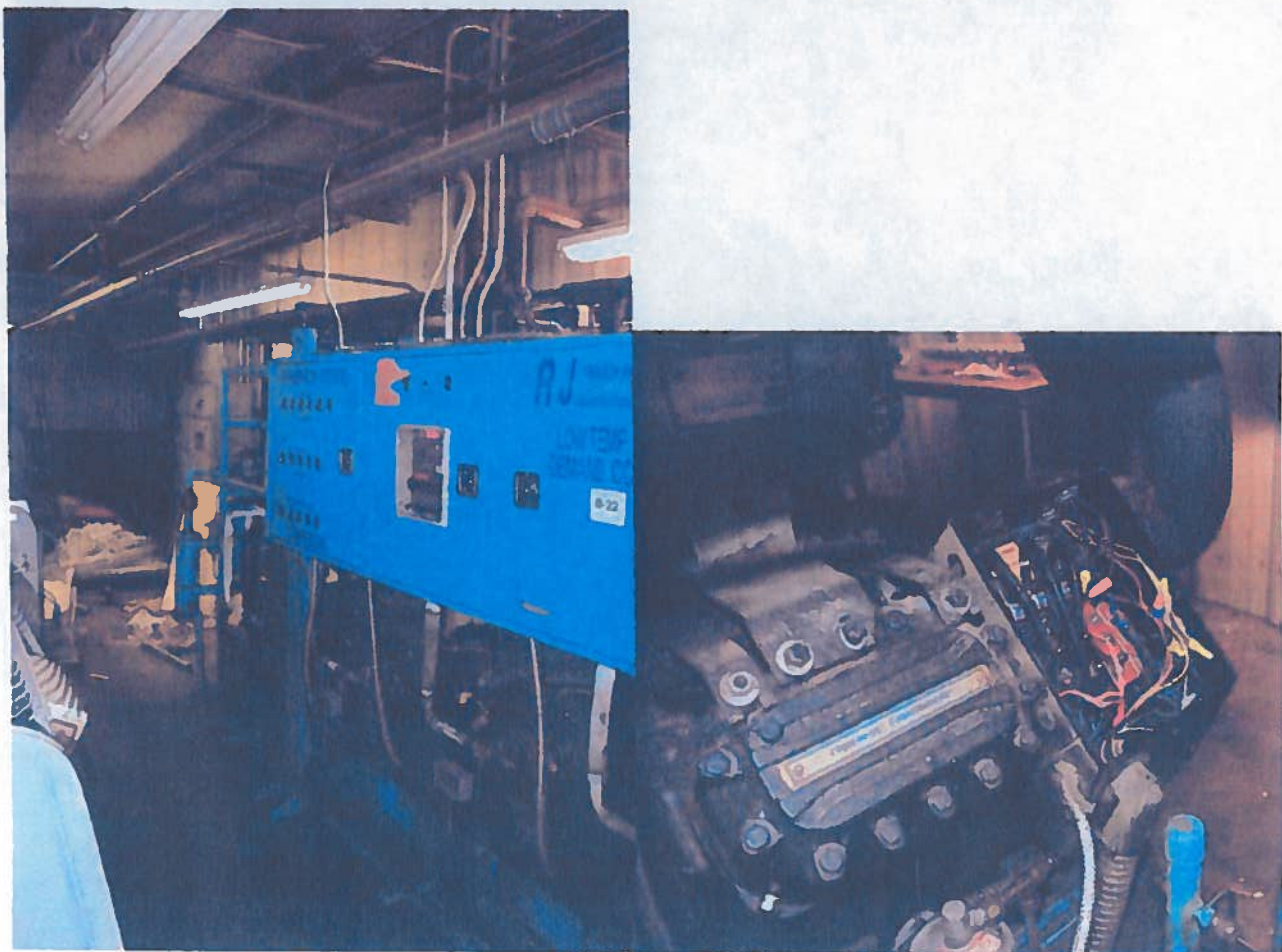
Following the interview I made the following observations:



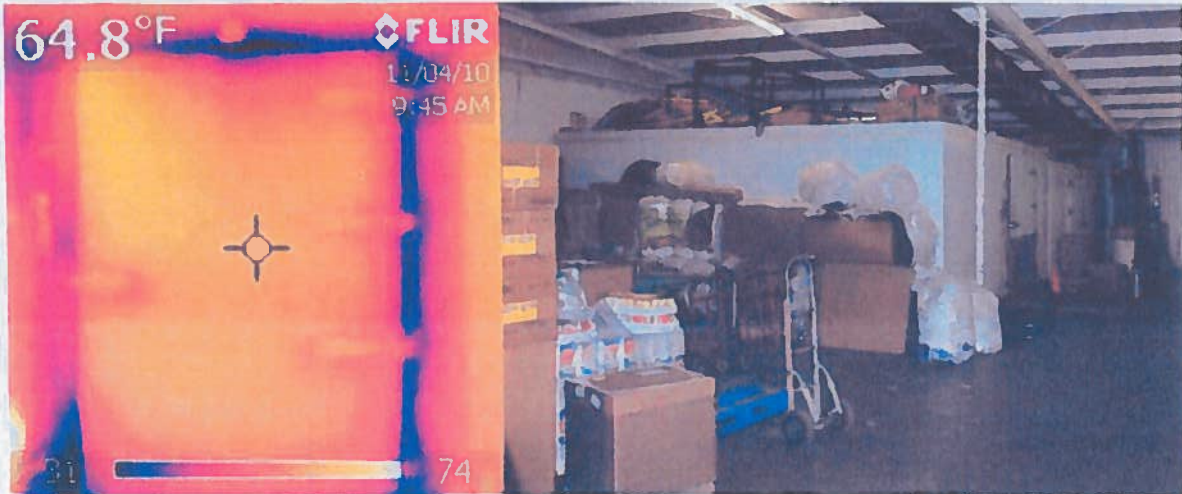
The outdoor condensing coil was badly damaged and had reduced air-flow.



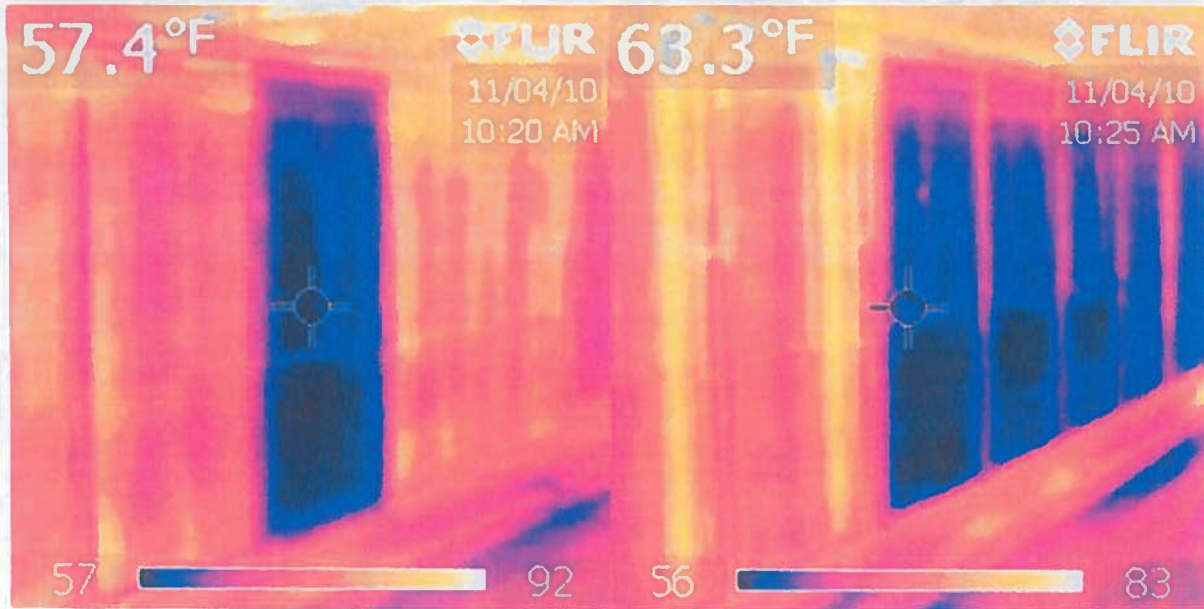
This split system air-conditioner dates from 2001 so is about 75% through its expected life.



The refrigeration equipment is 30 years old and is not efficient.



The doors to the Walk-In Freezer have leaks around the seals, letting cold air out.



Several reach-in doors have double pane glass that has lost its internal seal.



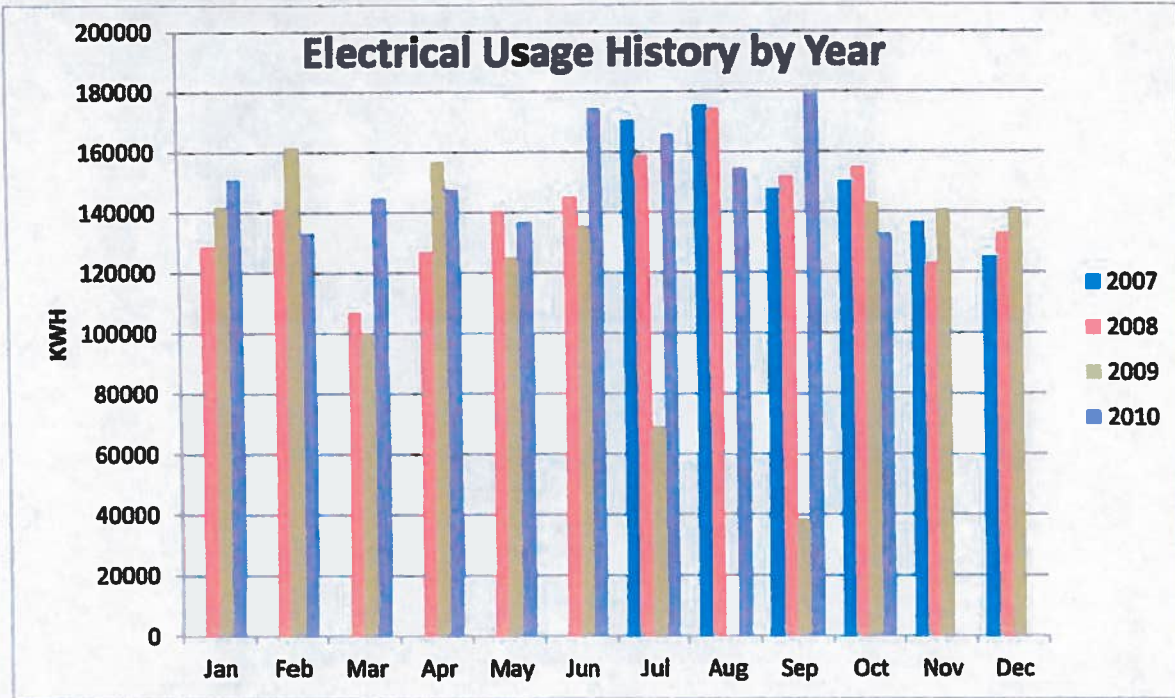
These split system condensing units are newer and date from 2005.



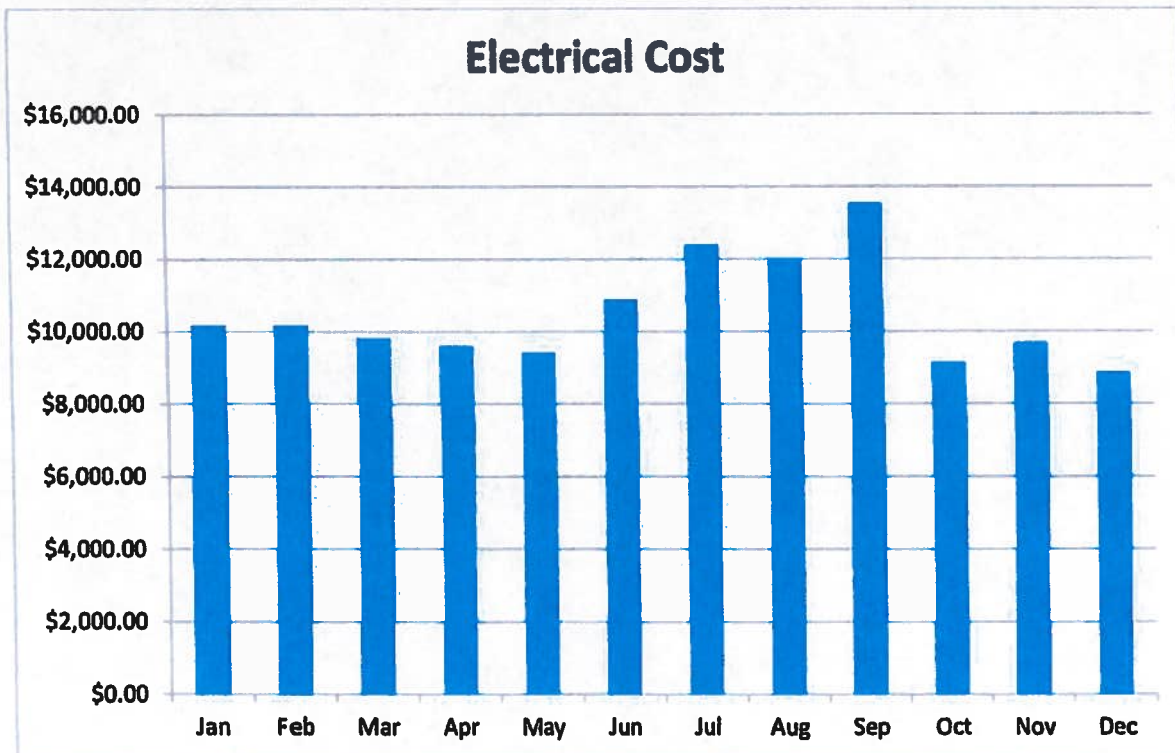
The fixtures are old style T12 lamps with magnetic ballasts.

Electrical Utility History

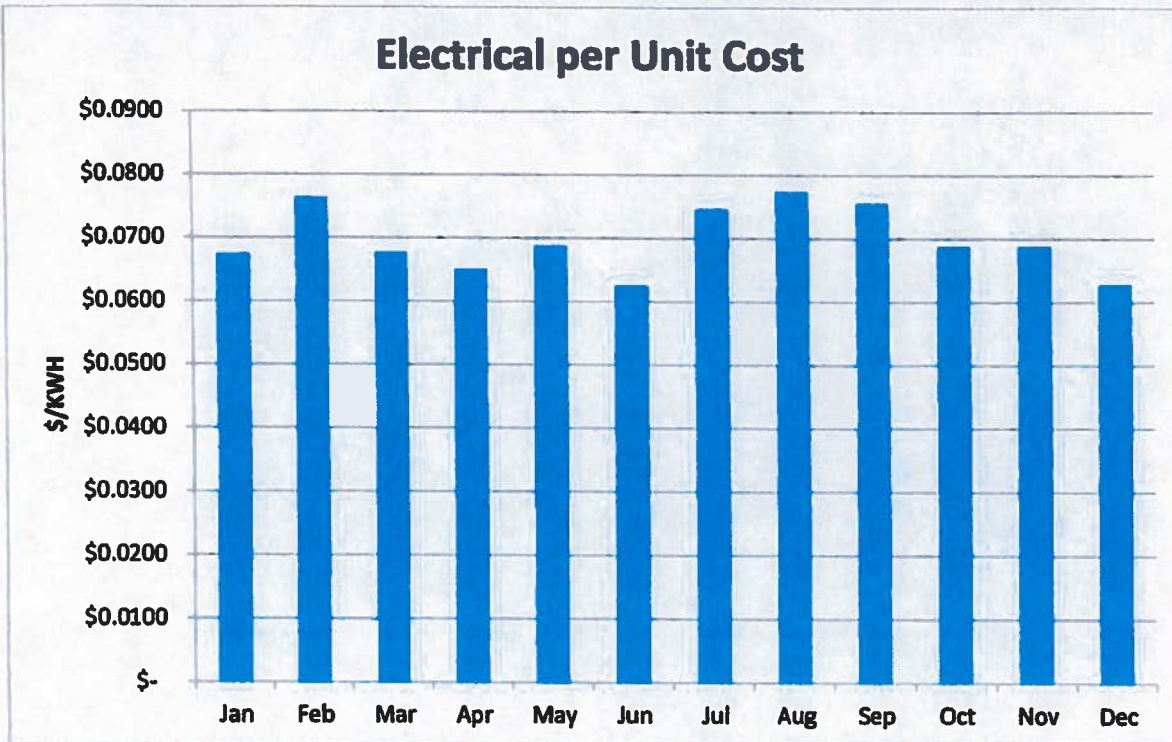
I acquired an electrical utility history for the facility going back to July 2007 thanks to Dale Smith of Petit Jean Electric. Graphs of usage are as follows:



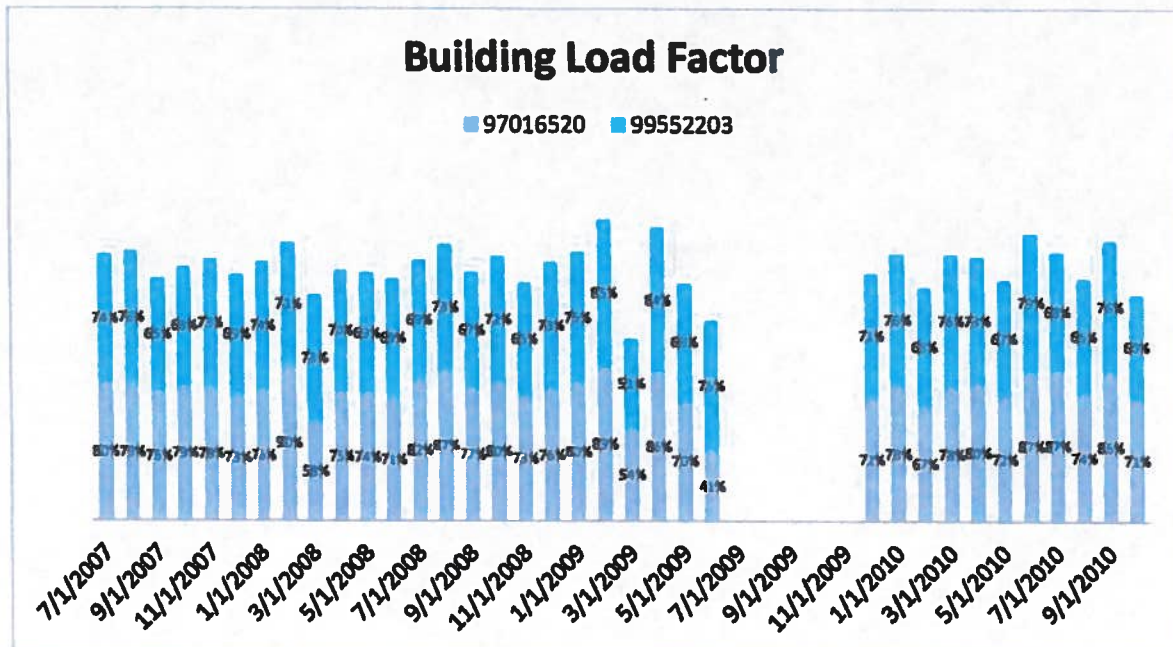
In February 2008 the electric meters were changed when the store was converted from a [REDACTED] to [REDACTED]. Usage didn't change that much due to the changeover. July and September of 2009 are lacking data.



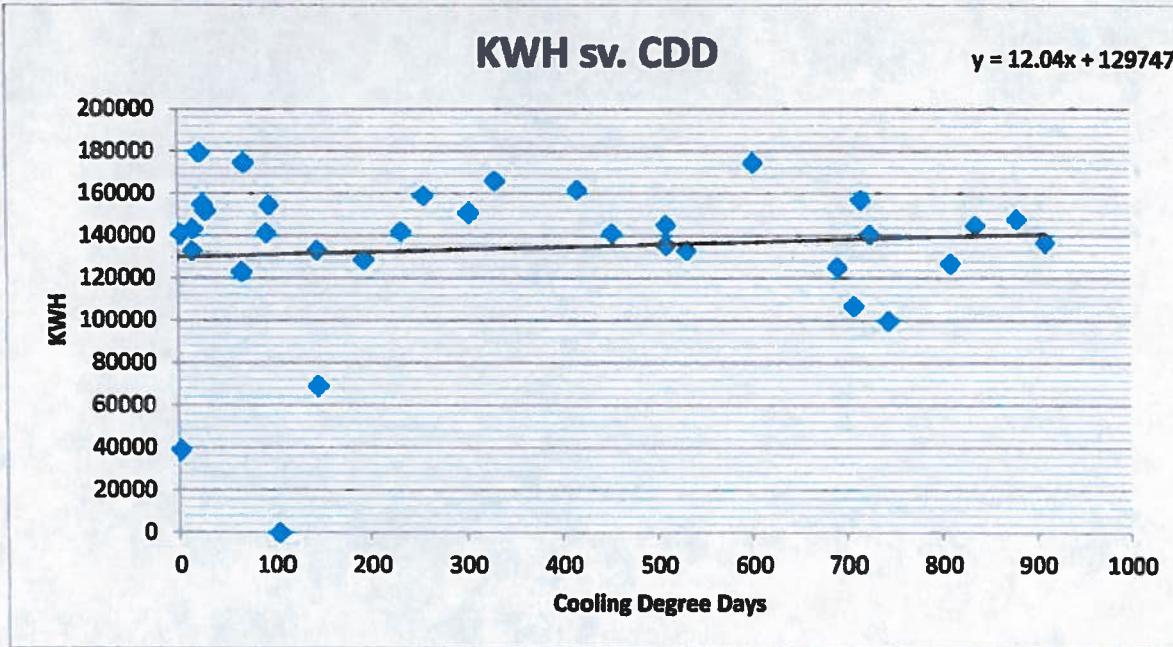
The above graph shows electrical cost for the last 12 months.



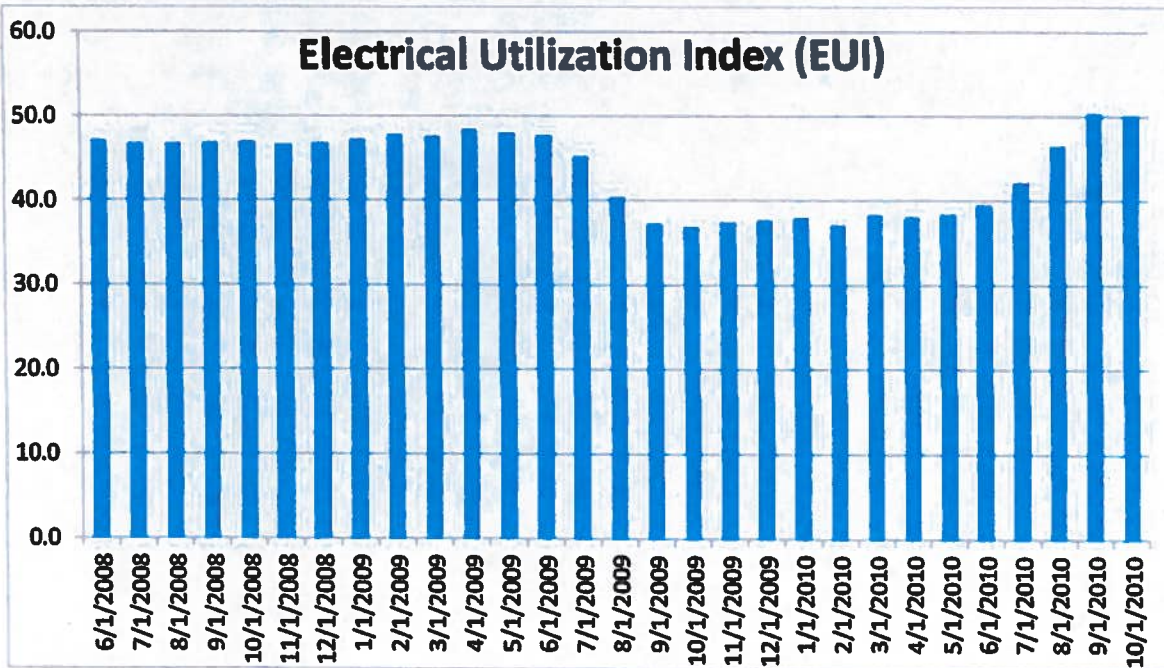
The average cost of electricity has been around \$0.07 per KWH for the last 12 months.



The building’s load factor stays consistently around 75% for both meters, an indication that most loads run day and night which is consistent with refrigeration loads.



This graph shows how the building responds to climate. As the cooling degree days increase due to more and warmer days the facility very gradually uses more electrical energy. The response is very weak even for a grocery store. This indicates that the store energy use is completely dominated by refrigeration and that the use of energy for space cooling is very small compared to refrigeration use. The store uses about 130,000 kWh per month all 12 months of the year on average.



The above graphs show the electrical utilization index (EUI) for the building. This is the electrical use per square foot per year. The EUI can now be compared to others similar buildings. I used the following web site to do this:



Commercial Buildings Energy Consumption Survey commercial energy uses and costs

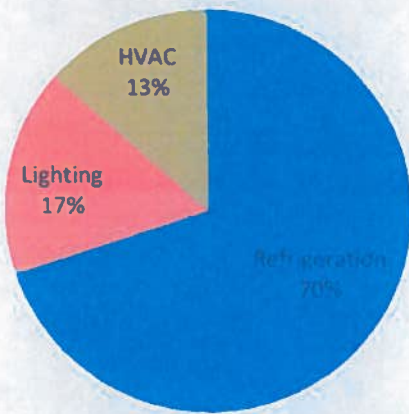
<http://www.eia.doe.gov/emeu/cbecs/>

Table C20. Electricity Consumption and Conditional Energy Intensity by Climate Zone^a for Non-Mail Buildings, 2003

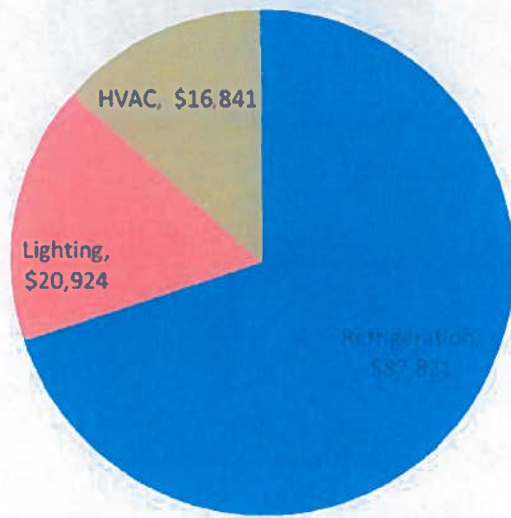
Principal Building Activity	Total Electricity Consumption (billion kWh)					Total Floorspace of Buildings Using Electricity (million square feet)					Electricity Energy Intensity (kWh/square foot)				
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Education	13	23	16	31	27	1,537	2,800	1,401	2,435	1,698	8.2	8.0	11.1	12.7	16.0
Food Sales	12	Q	Q	Q	Q	271	Q	Q	Q	Q	43.0	Q	Q	Q	Q
Food Service	7	12	Q	20	17	227	400	Q	440	366	29.3	30.6	Q	45.7	46.3
Health Care	10	18	11	20	14	475	784	564	844	496	20.6	23.3	19.2	23.7	27.6
Inpatient	6	12	8	17	9	262	450	323	592	278	23.7	27.7	23.3	28.2	34.0
Outpatient	4	6	3	3	Q	213	334	240	252	Q	16.7	17.4	13.7	13.4	Q
Lodging	8	21	12	18	10	768	1,314	1,132	1,275	608	10.1	15.9	Q	14.0	16.7
Retail (Other Than Mail)	10	10	10	16	15	710	865	695	1,454	592	14.2	11.0	14.8	11.3	25.9
Office	22	58	53	39	38	1,593	3,165	3,125	2,341	1,985	13.9	18.2	17.1	16.8	19.2
Public Assembly	8	8	6	18	9	876	818	806	906	529	9.1	9.5	Q	19.7	17.0
Public Order and Safety	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Religious Worship	1	5	2	5	5	408	1,320	499	1,039	488	3.0	3.5	4.9	4.8	10.1
Service	10	11	Q	7	Q	911	1,179	639	946	Q	10.6	9.6	Q	7.6	Q
Warehouse and Storage	11	24	11	16	9	1,564	2,539	1,428	2,186	1,710	7.0	9.6	7.9	7.5	5.0
Other	Q	11	Q	Q	Q	Q	467	Q	Q	Q	Q	24.6	Q	Q	Q
Vacant	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q

At 48 KWH/sq.ft./Year the facility falls above the national average for Climate Zone 1 Food Sales. Climate Zone 4 (Arkansas) is not listed and would probably be higher than Zone 1 (which is a northern zone). While the facility is not too far above average, I think there is room for improvement. The dip that occurs from September 2009 to June 2010 on the EUI graph is due to missing data.

Electrical Energy Budget

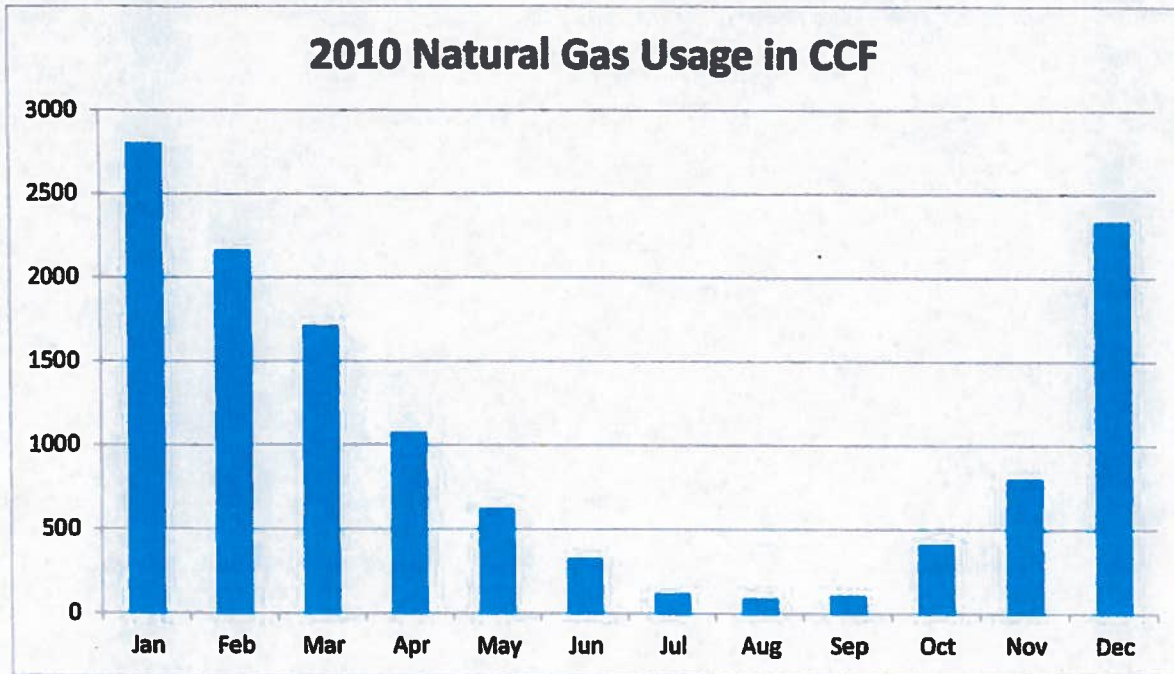


Electrical Yearly Cost

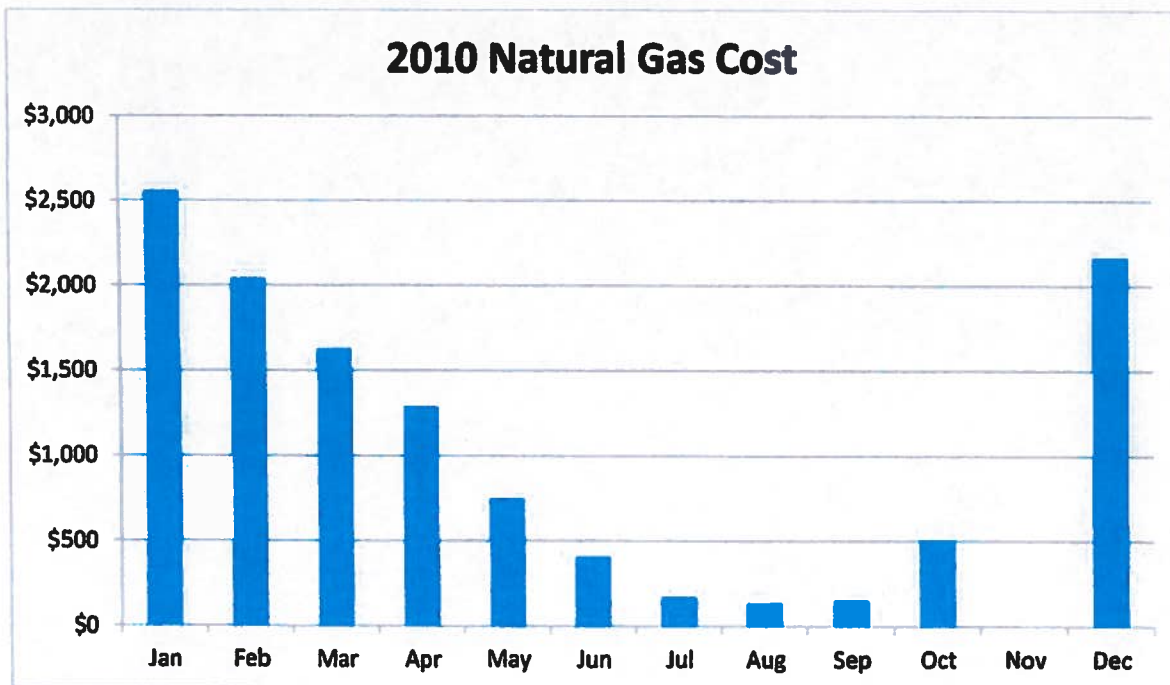


The pie charts show that 70% of the electricity is going towards refrigeration. This indicates that refrigeration needs to be the focus of any energy investments or improvements.

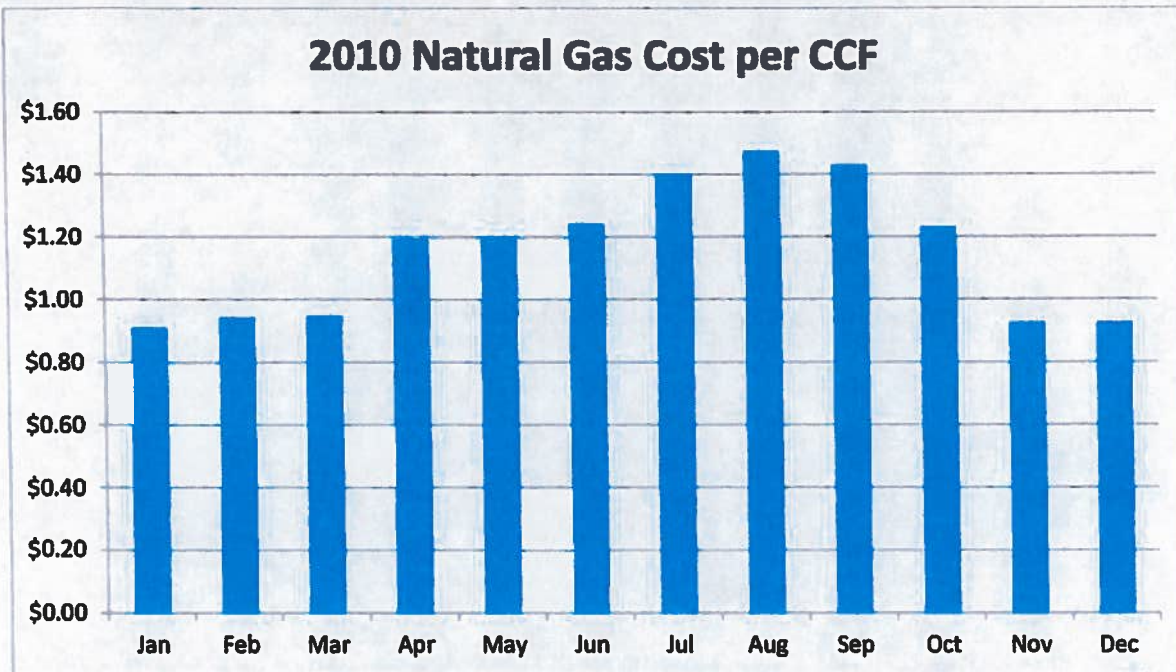
Natural Gas Utility History



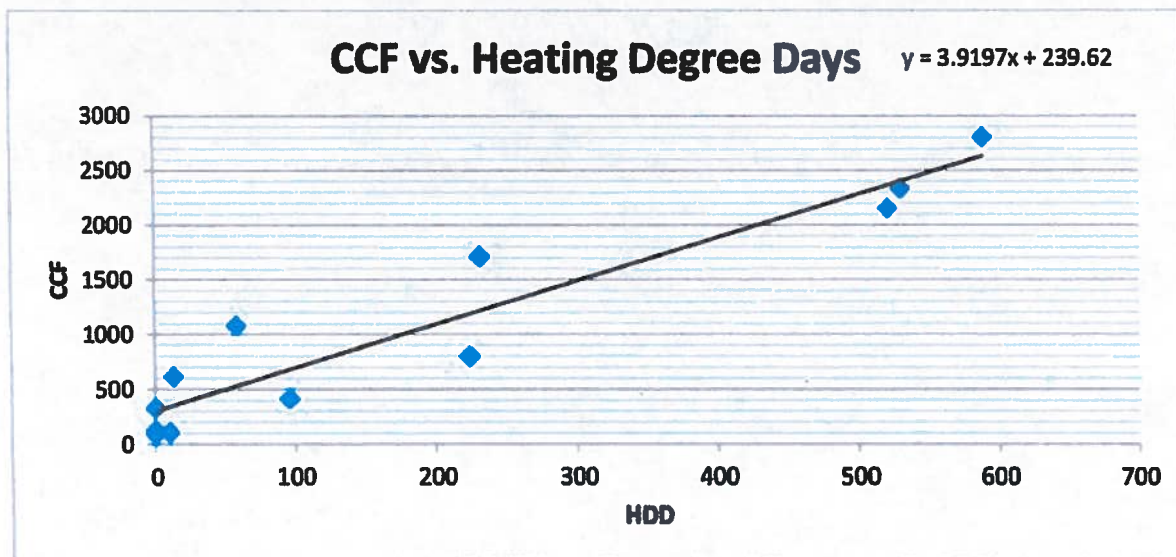
The building is heated with natural gas so usage peaks in the winter, however there is some domestic hot water heating as well that carries through the summer months.



Natural gas is about 10% of the electrical cost due to the overwhelming consumption of refrigeration.



The natural gas per unit charge has been running under 1\$/CCF except in the summer when the service connection charge dominates the bill.



The graph shows how the building responds to winter seasonal temperatures. The natural gas is used only for heating, so its use increases in a straight line as there are more and colder days.

The EUI for Natural Gas is 34.9CF/sq.ft./year for November 2009 thru October 2010. Consulting CBECS (below) the facility is above Mercantile for Zone 4. Apparently there is no data for Food Sales Natural Gas. This higher number may be due to the extra heat load caused by the refrigeration cases. Either way the gas is about 1/10th the electric bill, so my focus remains on electricity.

Table C30A. Natural Gas Consumption and Conditional Energy Intensity by Climate Zone^a for All Buildings, 2003

Principal Building Activity	Total Natural Gas Consumption (billion cubic feet)					Total Floorspace of Buildings Using Natural Gas (million square feet)					Natural Gas Energy Intensity (cubic feet/square foot)				
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Education	65	113	26	48	9	1,227	2,281	968	1,700	869	53.0	49.4	26.4	28.2	10.1
Food Sales	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Food Service	27	49	Q	64	31	174	368	Q	393	277	154.3	134.4	Q	161.9	110.9
Health Care	38	69	36	64	29	383	665	454	720	323	98.4	103.5	78.3	89.5	89.4
Inpatient	27	58	30	59	26	237	414	302	589	264	114.1	136.3	99.9	99.4	98.8
Outpatient	Q	12	Q	Q	Q	Q	251	Q	Q	Q	Q	49.4	Q	Q	Q
Lodging	34	86	36	34	18	609	1,183	958	967	538	55.5	72.8	Q	35.3	32.8
Mercantile	63	83	46	46	17	1,433	1,867	1,308	2,219	1,044	43.8	44.6	35.3	20.9	16.6
Retail (Other Than Mall)	27	27	16	16	Q	593	595	451	931	Q	46.1	45.8	36.1	17.0	Q
Enclosed and Strip Malls	35	56	30	30	Q	840	1,272	857	1,287	Q	42.2	44.1	34.9	23.7	Q
Office	60	106	60	22	14	1,252	2,575	1,977	1,539	865	48.0	41.0	30.1	14.4	16.1
Public Assembly	32	30	Q	25	Q	639	537	Q	700	Q	49.7	55.0	Q	35.4	Q
Public Order and Safety	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Religious Worship	14	38	14	13	Q	277	973	412	774	Q	49.2	38.9	32.8	16.5	Q
Service	49	37	18	23	Q	697	717	422	511	Q	70.9	52.1	Q	44.8	Q
Warehouse and Storage	33	44	33	16	Q	963	1,672	1,071	1,463	Q	34.5	26.4	30.7	11.2	Q
Other	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Vacant	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q

Summary

There are several items of possible energy improvement. The following is a list of my thoughts on this:

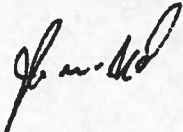
1. Clogged condenser coils should be cleaned first. Refrigeration has been costing an average of \$7300 per month, lighting about \$1800 per month and air conditioning up to \$4000 per month in the summer months. So as you can see the biggest impact to the energy picture is the refrigeration. Let's say cleaning coils makes a 10% improvement over what it is now, this could save \$730 per month!
2. Leaky case doors and walk-in doors should also be checked as well. Even a 1% improvement would save \$73 a month. If there are very many doors with bad seals this number could be two or three times higher.
3. Making sure the air-conditioning equipment is working properly and putting out properly dehumidified air can also help save on refrigeration as well as air-conditioner energy. Have all air conditioners checked for refrigerant charge and proper air flow. The discharge air should be no higher than 60 degrees.
4. Changing store lighting to T-8 lamps and electronic ballasts. If the entire store were converted from standard T12 with magnetic ballasts the savings would be about \$360 per month off the \$1800 the store is currently using. Usually it is not feasible to group re-ballast and re-lamp a building unless the system is wore out and the lighting needs replacing anyway. But as ballasts and lamps wear out replacing them with the newer technology will save on that portion.
5. Case lighting can be changed to LED. Replacing fluorescent case lighting with LED's can save about \$50 per door per year, allowing for a 1 to 2 year payback. LED lighting actually works

better in cold temperatures, whereas fluorescent gets dimmer and uses the same energy. LED lighting also makes less heat for the refrigeration equipment to remove. Plus you can put motion sensors on the LED's to shut them off when no customers are present.

6. Aging refrigeration equipment. Refrigeration is currently costing \$88,000 per year in electricity usage. As noted in item 1 the equipment needs to be checked or replaced. Compressors need to be checked and replaced if needed. Refrigerant should be monitored. If levels are low the compressors will labor, wasting energy. Another possible problem is systems going into defrost too often, wasting a lot of energy. Clean and check all coils, check expansion valves, refrigerant levels, defrost function and timing etc. If the systems are corrected and/or replaced the savings could amount to \$2000 to \$3000 per month savings.

As you can see there are several opportunities for saving energy. Please feel free to call if there are any questions.

Yours truly,



John W. Reed, PE, CEM

Exhibit 5



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Rural Arkansas
January 2011 **LIVING**

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Something for Everyone: Gluten-Free Recipes

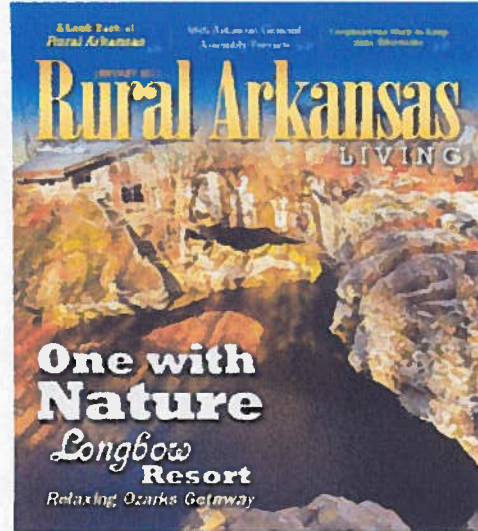


- Cherry-Misu
- Cherry Whoopie Pies
- Vegan Magic Bars
- Cherry Cannoli Cups
- Cherry Brownie Bites

[Click Here](#) for more recipes.

One With Nature: Longbow Resort

New Year, New Design



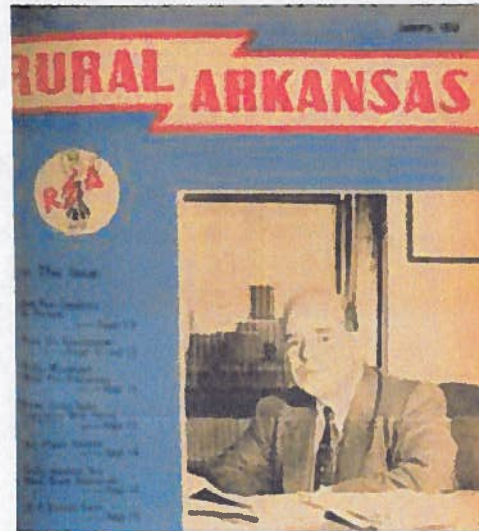
You may notice a different look for your cooperative magazine, and even a different name – *Rural Arkansas Living*, but one thing remains the same: we are still looking out for you.

[Click Here](#) to read about the changes and advancements of *Rural Arkansas Living*.

Rural Arkansas: Telling the Cooperative Story



[Click Here](#) to experience Longbow Resort, a beautiful, natural escape built into the Ozark Mountains.



[Click Here](#) to read about the evolution of Rural Arkansas magazine.

Reflections: Beginning the New Year in Rural Arkansas



[Click Here](#) to view images submitted by our readers.

New Year's Resolution: Seal Leaks



[Click Here](#) to read tips on finding and sealing cracks and air leaks in your home that increase your energy bill.

Start Your Day Off on the Right Foot

Arkansas Scrapbook:
The Arkansas Tuberculosis Sanatorium

[Click Here](#) to learn how your daily routine could affect your health and energy levels.



Once the model for tuberculosis treatment facilities in the U.S. and abroad, the Arkansas Tuberculosis Sanatorium in Booneville is listed on National Register of Historic Places.

[Click Here](#) to learn more.

[Click here to view the entire *Rural Arkansas* January issue!](#)



**Electric Cooperatives
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→ *Forward to a Friend*

**Johnny Cash Music Festival Set
for Aug. 4**



A musical festival, featuring friends of Johnny Cash, is scheduled for Aug. 4 to raise funds to restore the Cash family home in Dyess. [Click here for more information](#)

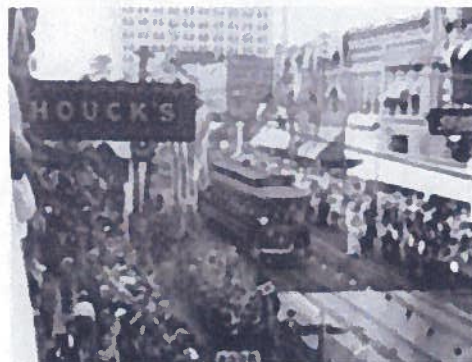


**Garvan Woodland Gardens:
Four Seasons of Beauty**



From spring daffodils to winter pansies, each season brings new elements of beauty to the 210-acre park. [Click here](#) to read more.

"The Thinning Line of Gray"
The 1911 Confederate Veterans Reunion



In May 1911, Arkansas was one of the busiest places in the South during the 21st Annual Confederate Veterans Reunion. [Click here](#) to learn how it changed the history of our state.

Grow a Delicious Landscape



Nasturtium Salad Dressing
Sunchoke Soup
Sautéed Swiss Chard
Asiago-Chive Biscuits
Stuffed Daylilies

[Click here](#) to read about how ingredients from your own yard can inspire delicious dinners.

Let's Eat: Sweet Treats Can't Be Beat



[Click here](#) to read about Sweet Treats Sandwich and Pie Shop in Lamar.

[Click here to view the entire Rural Arkansas Living May issue!](#)

Scrapbook: Opera in the Ozarks



[Click here](#) to read about the upcoming performances at Inspiration Point in Eureka Springs.

Reflections: The Cat's Meow in Arkansas



[Click here](#) to view pictures submitted by our readers.



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June 2011 537188

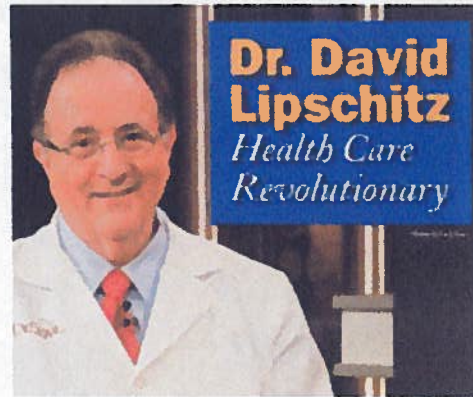
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Revitalize Your Veggies



Spinach Artichoke Pizza
Spring Greens with Brie Toasts
Blue Cheese Spring Salad
Oven Baked Sweet Potato Strips
Mango Chicken Salad

Having trouble fitting three to five servings of vegetables into your day? [Click here](#) for recipes that incorporate veggies in new ways.



Well-known geriatrician Dr. David Lipschitz has ambitious plans to revolutionize the United States health care system. [Click here to learn more.](#)

Paragould High School Wins 2011 Electric Vehicle Rally



A record number of students participated in this year's Electric Vehicle Rally, held Friday, May 6 at Pulaski Technical College. [Click here](#) to read about the event and for a complete list of winners.

Butterflies and Caterpillars in Your Garden



[Click here](#) to learn how to draw beautiful butterflies into your garden this summer.

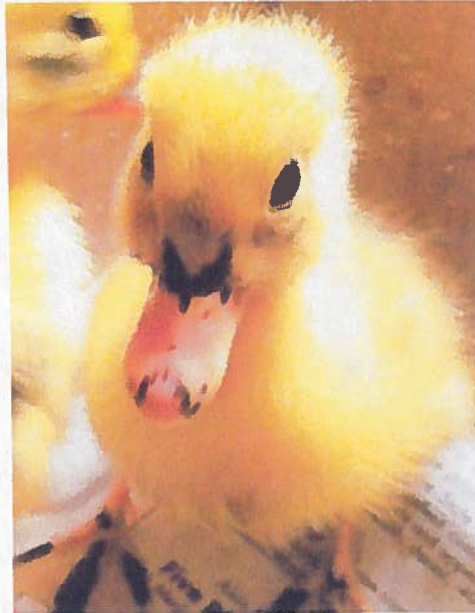
Summer Grilling Tips



Now is the time to fire up the grill!

[Click here](#) for tips and precautions.

Reflections: Fun Times in Rural Arkansas



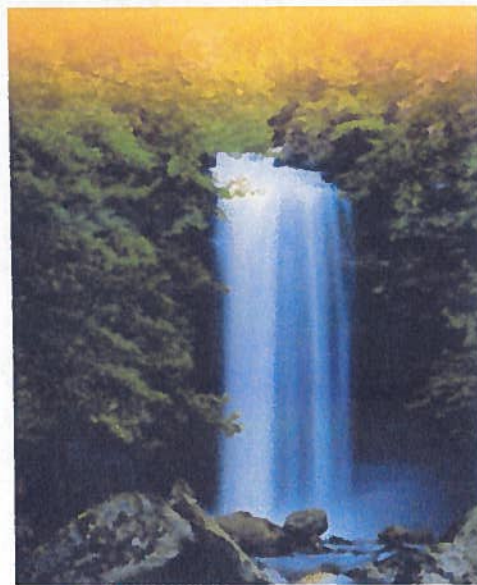
[Click here](#) to view pictures submitted by our readers.



Win a
\$50,000
Energy Efficiency
Makeover

[Click Here to Enter 2011 Contest](#)

A Walk in the Woods



[Click here](#) to read about the beautiful trail to Cedar Falls in Petit Jean State Park.

NRECA Annual Legislative Conference



**National Rural Electric
Cooperative Association**

A Sustainable Energy Cooperative 

[Click here](#) to learn about how your local elected representatives and cooperative staff are fighting for you.

[Click here to view the entire
Rural Arkansas Living June issue!](#)



**Electric Cooperatives
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Rural Arkansas
August 2011 LIVING

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Go Green with Pistachios for Better Health



Green Beans with Lemon, Olive Oil and Parmesan Cheese
Fennel and Orange Salad with Toasted Pistachios
Salmon Pistachio Lettuce Wrap
Grilled Chicken Rice Salad with Pineapple and Pistachios

[Click here](#) for healthy ways to incorporate pistachios into your diet.

Honor Flight Network: "A Gift of Kindness"



More than 63,000 veterans have been given the chance to see the memorials built for their service. [Click here](#) to read about their emotional and educational trip.

A Walk in the Woods: Yellow Rock Trail, Devil's Den State Park



How to Pave a Patio



Ready to start a summer project? [Click here](#) to learn how selection of colors and placement can

[Click here](#) to read about the three-mile trek that features spectacular views and interesting rock formations.

Join the Fun at Secchi Day on Beaver Lake



[Click here](#) to see how you can participate in Secchi Day, an annual education event where you can learn about water quality while having fun!

Group Works to Restore Ozark Chinquapin Tree



The Ozark Chinquapin Foundation was established to prevent the extinction of the native tree while working to re-populate them throughout the U.S. [Click here to read more.](#)

[Click here to view the entire August issue of Rural Arkansas Living!](#)

affect the functionality and beauty of your patio.

Reflections: August Scenes in Rural Arkansas



[Click here](#) to view pictures submitted by our readers.



[Click here](#) for six tips to stay cool this summer.



**Electric Cooperatives
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Arkansas Living
September 2011

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Lunchbox Makeovers



Peanut Butter and Jelly Sushi Rolls
Crispy Treat Cut-Outs
Peanut Butter and Jelly Muffins
Apple Raspberry Juice
Peanut Butter and Jelly Pinwheels

[Click here](#) for creative recipes to bring more fun to lunch favorites.

Glen Campbell Brings Goodbye Tour to Forrest City

Cleburne County Couple Wins \$50,000 Energy Efficiency Home Makeover

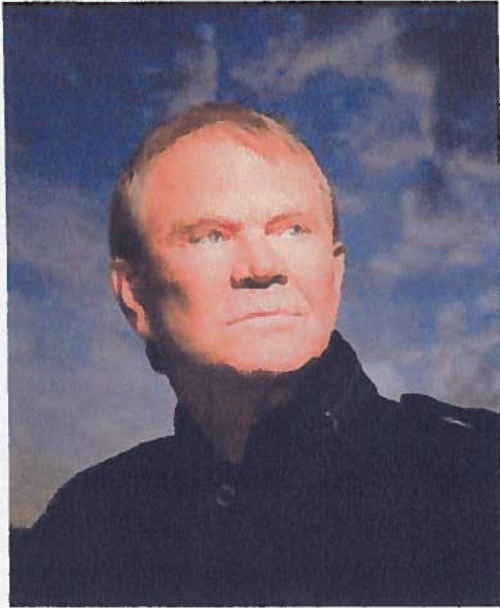


First Electric members Larry and Nancy Ferrell from Hopewell will receive a home transformation that will change their lives. [Click here](#) to read their story.

Directors' Summer Conference 2011 EPA Rules Setting Stage for "Train Wreck"

[Click here](#) to learn about new EPA rules that could affect your electricity bill.

Reflections: Last Days of
Summer in Arkansas



Legendary musician Glen Campbell will perform September 10 at East Arkansas Community College. [Click here](#) for concert and ticket information.



[Click here](#) to view pictures submitted by our readers.

Cavern Offers Maze, Gem Panning and More



At War Eagle Cavern on northwest Arkansas' Beaver Lake you experience more than a cool cave. [Click here](#) for more details.

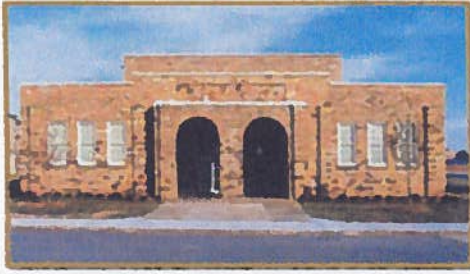
Beyond Swirly Bulbs



Starting in January 2012, the U.S. Government will require 100-watt incandescent bulbs to become more energy efficient. [Click here](#) to read about the change and updated options for your home.

Let's Eat: Cotham's Mercantile

Gymnasium, Greenwood



[Click here](#) to read about the renovation of a community staple in northwest Arkansas.

[Click here to view the entire September issue of *Arkansas Living!*](#)



[Click here](#) to read about our experience with the "Hubcap" burger and the famous Mississippi Mud Pie from Cotham's restaurant in Scott.



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Arkansas Living

November 2011

Co-ops are Energy Efficiency Leaders

Your local electric cooperative works hard to help you keep your electricity bills affordable. Read about cooperative programs and information available to help you save energy and money.

[Read More](#)



**Saving
Energy**

Fuel Cells



Electric cooperatives continue to explore new and innovative options to reduce costs and provide reliable energy choices. [Click here](#) for information on fuel cells.

Individual Room Heaters



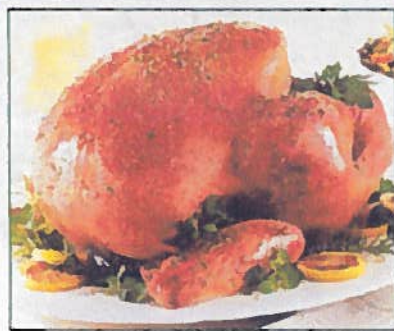
As the weather starts to get colder, thoughts turn to using individual room heaters. [Click here](#) to learn what Doug Rye Says about space heaters.

Let's Eat



Who Dat's in Bald Knob is a Cajun and Creole family affair with some of the best steak and seafood found in Arkansas. [Click here](#) to learn more about "The Big Easy in Bald Knob."

Thanksgiving Tips



- Roast Turkey with Mediterranean Rub
- Asiago Whipped Potatoes with Turkey Bacon
- Cake and Ice Cream "Pops"

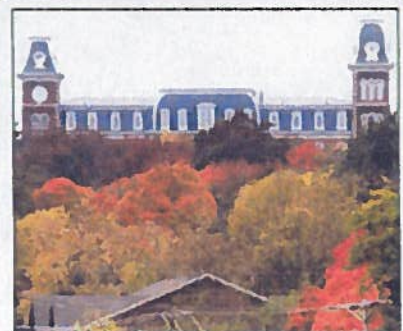
[Click here](#) for expert tips and recipes for a picture-perfect Thanksgiving.

Reflections



Arkansas Living in November. [Click here](#) to view pictures submitted by our readers.

Old Main



This historic landmark has become the primary symbol of the University of Arkansas in Fayetteville. [Click here](#) to read the building's interesting history.

Exhibit 6



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[Your Energy Dollars](#)

[Energy Costs Adjustment](#)

[Reading Your Meter](#)

[Touchstone Energy Saver Tools](#)

Tips to help control energy consumption and costs.

Energy Efficiency

With just a few changes, any home or business can become much more energy efficient. The Electric Cooperatives of Arkansas are committed to helping customers preserve resources and manage energy costs. Utilize the following resources to help you save energy, save money and live comfortably.

Smart Energy Resources:

- [Smart Energy Tips](#)
- [Energy Efficiency TV & Radio Commercials](#)
- [Home Energy Calculator](#)
- [Appliance Use Calculator](#)
- [Reading Your Meter](#)
- [Touchstone Energy Saver Tools](#)
- [Geothermal Heating and Cooling](#)
- [HomeEnergyLibrary](#)
- [Fundamentals of Electricity](#)
- [Geothermal Systems](#)
- [Power Quality](#)
- [Kids Korner](#)
- [InteractiveEnergyHome](#)
- [Lighting Calculator](#)
- [Heat Pump Calculator](#)
- [Television Calculator](#)

Energy Efficiency Brochures

- [Energy Efficiency](#)
- [Compact Fluorescent Lamps](#)
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Our commitment to providing environmentally sound power resources.



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Energy Efficiency

About Doug Rye

Each week, Doug Rye dons his headphones and hits the airwaves to promote energy efficiency. Known as the "King of Caulk and Talk," he provides tips to help callers to his "Home Remedies" show lower their energy bills. During the program, he answers questions from listeners across the country. He also shares his expertise at energy seminars across the country and in a monthly column in *Arkansas Living Magazine*, the official publication for members of Arkansas' electric cooperatives.

Promoting energy efficiency is Doug's true calling, but it took some time for him to discover that niche. When he graduated from the University of Arkansas at Fayetteville with a degree in architecture and began his career in 1968 at the Farmers Home Administration (FmHA), he knew nothing about energy efficiency. But that later changed when the Arab oil embargo placed a stranglehold on the nation, creating long lines at gas pumps and sending electric rates skyrocketing. It was then that he was assigned to find ways to help low-income families lower their soaring electric bills.

"We had people in Arkansas who lost their homes during the oil embargo because they could not pay their bills," he recalls.

To learn more about energy efficiency, Doug read everything he could find on the topic. He then began conducting seminars, many of which were sponsored by the state's electric cooperatives, for builders within the state. In the 1980s, interest in energy efficiency waned, but Doug kept plugging along at FmHA, overseeing the construction of energy-efficient housing for low- and moderate-income families and senior citizens. In 1991, Doug decided to leave his job to pursue his dream of hosting a radio show where he could promote energy efficiency. Later that year, his dream came true when he landed his own show on a Little Rock radio station. It turned out to be a major success and today, "Home Remedies" is aired on radio stations in several states.

In addition, Doug has teamed up with the Electric Cooperatives of Arkansas to construct model homes using his building techniques. Doug also hosts energy seminars throughout the state and across the country and writes a monthly column on energy efficiency for *Arkansas Living Magazine*. In addition, the self-proclaimed "energy nut" spends a lot of time on the phone, answering questions from his home office in Saline County, Arkansas.



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Doug Rye's Column

Doug Rye has promoted energy efficiency for more than 30 years. For the last 17 years, he's been spreading the word through his popular "Home Remedies" radio show, which can be heard on stations across the country, including Arkansas, and through energy seminars he hosts nationwide. Since 1997, Doug has worked as a consultant for the Electric Cooperatives of Arkansas to promote energy efficiency to cooperative members statewide.

Publications reprinting the archived columns are asked to utilize the following attribution:

"Reprinted courtesy of Arkansas Living Magazine and Electric Cooperatives of Arkansas. Doug Rye, a licensed architect living in Saline County, Ark., is the popular host of the "Home Remedies" radio show and a promoter of energy efficiency building. To reach Doug, call him at 501-653-7931."

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2/1/2012	Keeping It Simple
1/1/2012	East Students Take The Challenge
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7/1/2011	It is Hot and I Hope That You Have Your Plan Ready
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7/1/2010	What is the best wall insulation for existing homes?
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3/1/2010	What is COP?
2/1/2010	Cooperatives add hybrid water heater to offerings

1/1/2010	Happy New Year! And the winners are...
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Ask Doug

You can submit questions to Doug for his column in *Rural Arkansas Living* magazine by writing to:

Doug Rye Says...
C/O *Arkansas Living Magazine*
P.O. Box 194208
Little Rock, AR 72219-4208

You can also contact Doug at his home office at 501-653-7931. Because of time and space limitations, Doug regrets that he cannot answer all questions.

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Doug Rye Radio

Doug Rye may be the best-known residential energy consultant in the nation. Since 1990, his weekly "Home Remedies" radio show has provided practical insight into home construction ideas and energy efficiency measures. Doug is known nationwide for his honest, down-to-earth and friendly style. His show airs live each Saturday morning from 9:00 a.m. to 10:00 a.m. (Central Time) on Little Rock's KABZ, 103.7 FM. Currently, the show airs live and tape-delayed in 18 states.

Callers with energy efficiency, new construction and remodel questions are always welcome and encouraged to call the show. The station number is 1-800-477-1037.

Click to hear his prerecorded radio shows:

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December 4, 2010	1 2 3 4 5 6 7
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Congratulations - Larry and Nancy Ferrell

Larry and Nancy Ferrell are the grand prize winners of the 2011 Energy Efficiency Home Makeover valued at up to \$50,000. The Ferrells are members of First Electric Cooperative and live in Hopewell, Arkansas.

The Ferrells' 31-year-old home will receive comprehensive pre- and post-diagnostic energy audits, including a blower door test, duct blaster test and infrared thermography. The home will receive numerous energy-saving applications, including sealing the building envelope, Retrofoam insulation in the sidewalls, a foam encapsulated attic, an energy efficient Marathon water heater, an ultra-efficient geothermal heating and cooling system, and high-efficiency windows and doors. The home has very little insulation, inefficient windows, and is heated and cooled by an older mismatched inefficient system.

More than 2,000 applications were submitted for the contest. In addition to the grand-prize winner, 16 runners-up will receive free 40-gallon high energy-efficient Marathon water heaters.

Second Prizes - Energy-Efficient Marathon Water Heaters valued at up to \$700:

- Jackie Ray, Arkansas Valley Electric Cooperative of Ozark;
- Sam Taunton, Ashley-Chicot Electric Cooperative of Hamburg;
- Ernesto Muniz, C & L Electric Cooperative of Star City;
- Dawn Harris, Carroll Electric Cooperative of Berryville;
- Ronnie Davis, Clay County Electric Cooperative of Corning;
- Kimberly Markum, Craighead Electric Cooperative of Jonesboro;
- Albert Cathey, Farmers Electric Cooperative of Newport;
- Paul G. Borden, Mississippi County Electric Cooperative of Blytheville;
- James F. Bonewits, North Arkansas Electric Cooperative of Salem;
- Doyle Vann, Jr., Ouachita Electric Cooperative of Camden;
- Matt and Carrie Brandenburg, Ozarks Electric Cooperative of Fayetteville;
- Leonard Coe, Petit Jean Electric Cooperative of Clinton;
- Steve Holton, Rich Mountain Electric Cooperative of Mena;
- Doris Dunlap, South Central Arkansas Electric Cooperative of Arkadelphia;
- Edward L. Caldwell, Southwest Arkansas Electric Cooperative of Texarkana;
- Jerry Green, Woodruff Electric Cooperative of Forrest City.

Participating Sponsors

- Marathon Water Heaters

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2011 Energy Efficiency Home Makeover Grand Prize Winners Larry and Nancy Ferrell.

- Harry G. Barr Company
- Rood Inc.
- Doug Rye
- Water Furnace
- BPSI Foam Insulators
- General Electric
- Straight Line Roofing
- Wilco Siding & Gutters
- FL Davis Building Supply
- Lakeside Siding Supply/Heber Springs

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 Cranford Restaurant in Bartlett, Arkansas.

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September 14, 2011	Week Five Update	View Video
September 6, 2011	Week Four Update	View Video
September 1, 2011	Week Three Update	View Video
August 21, 2011	Drilling Geothermal Wells	View Video
August 21, 2011	Old Appliances Review	View Video
August 21, 2011	Week Two Update	View Video
August 13, 2011	Comments from the Ferrells	View Video
August 13, 2011	Week One Update	View Video
August 8, 2011	2011 Makeover Winner Announcement	View Video
August 8, 2011	Makeover Project Overview	View Video

Makeover Project Photos

Date:	Title:	Link:
August 19, 2011	Foam Insulation and Geothermal	View Gallery
August 17, 2011	Insulation, Attic Door, Exhaust Fan, Vapor Barrier	View Gallery

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05-15-2011	Clear Channel Radio - Arkansas on Air	Listen
05-22-2011	KFSM-TV Sunday News	Listen

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Date:	Title:	Link:
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08/08/2011	Energy Efficiency Makeover Winners Announced	Read...
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Week 5

The makeover team made significant progress this week in spite of the short Labor Day holiday! We only need a couple more days to complete some painting, trim work, sealing the crawlspace vents and other punch list items.

During the initial energy audit the team discovered that the Ferrell's were doing the best they could to manage their electric bill. They kept the window blinds closed and the drapes pulled in order to stop the sun's intense radiant heat from entering the home. Today, closing blinds and drapes is not necessary due to the energy efficient WeatherBarr windows and the Larson energy efficient storm doors that have been installed.

The team used a box blade to repair the lawn which was disturbed while installing the Geothermal header ditch. By next summer, you won't even know there are three geothermal loops in that location.

Wilco Siding and Gutters from Hopewell finished installing the foam-backed vinyl siding. Doing so completes an encapsulating thermal and moisture barrier consisting of foam insulation. Also, gutters were installed to divert water away from the perimeter of the home. Water diversion will help keep the crawlspace dry.

Repairs to the hallway ceiling were made and painting is complete. The ceilings in the main living and dining area were repainted to look like new.

The wood-burning fireplace is gone and the firewood has been given away. A backup generator was provided in the unlikely event of an extensive power outage. A GenerLink safety connection system was installed into the meter socket. The GenerLink provides a quick, easy and extremely safe connection method for hooking up backup generators to residential dwellings. Using a GenerLink protects both the homeowner and electric cooperative personnel from generator back-feed. They also eliminate the need for an expensive transfer switch. Visit www.generlink.com for more details.

After this week, we'll be ready to bring in our team of Building Performance Institute building analysts for a final comprehensive audit. They will complete the final interior caulking and sealing package, blower door and duct blaster test. The final performance testing is scheduled for Sept. 23.

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- The new industry-exclusive GE GeoSpring™ Hybrid Electric Water Heater is designed to provide the same hot water homeowners are accustomed to, but requires only about half the energy to produce it. For example, based on the same standard tank water heater that uses approximately 4,800 kWh per year, the new GE GeoSpring™ Hybrid Water Heater is designed to:
- Consume up to 62% less energy than a standard electric water heater
- Result in energy savings of \$320 per year

**Based on DOE test procedure and comparison of a 50-gallon standard electric tank water heater using 4,881 kwh per year versus the GE heat pump water heater using 1,856 kwh per year.*

The GE GeoSpring™ Hybrid Water Heater combines energy-saving heating technology with traditional electric heating systems used in most standard water heaters on the market today without sacrificing the amount of hot water it can deliver.

This hybrid technology is designed to absorb heat in ambient air and transfer it into the water. Since it requires much less energy to absorb and transfer heat than it does to generate it - as a standard electric water heater would - the GE GeoSpring™ Hybrid Water Heater provides the same amount of hot water while using less energy.

The GE GeoSpring™ Hybrid Water Heater features a user-friendly electronic control system that offers both simplicity and flexibility, giving consumers as much or as little control of operating modes as they like. Water temperature may be precisely set from 100 to 140 degrees to maximize energy benefits and comfort.

The unit exceeds the ENERGY STAR® minimum requirement of a 2.0 energy factor (EF) with a 2.35 EF or 235% efficient.

Now available through your local electric cooperative or by calling 1-800-451-8061 between 8:00 a.m. and 5:00 p.m. Central Time. Additional information and an installation video are available on Genera Electric's website listed below:

<http://www.geappliances.com/products/water/heat-pump-water-heater/>

Federal tax credit information:

www.energystar.gov

Arkansas Energy Office Rebate Information:

www.arkansasenergy.org





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ELECTRIC COOPERATIVES OF ARKANSAS

Just as they were pioneers in the development of rural electrification, the Electric Cooperatives of Arkansas were also at the forefront of the renewable energy movement. Long before "green power" became a household phrase, the cooperatives began a commitment to develop hydropower along the Arkansas River to the fullest extent possible.



Twenty years and \$330 million later, the Electric Cooperatives of Arkansas operate three environmentally friendly hydropower plants that provide low-cost, clean energy to more than 490,000 Arkansans across the state. In addition to those plants, they own five other power plants and co-own portions of three others. These plants, which burn natural gas and low-sulphur coal, meet or exceed all federal environmental requirements.

As we continue to look for innovative ways to provide Arkansans with environmentally sound power resources, we are asking for your help. New technology needs to be developed, and that is costly. To support this effort, we are offering a new GreenPower program in which you can contribute to the development of additional renewable energy resources, as well as further help spread the word about ways to use energy more efficiently.

[Click here to sign up for GreenPOWER!](#)

Our commitment to providing environmentally sound power resources.



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Energy Efficiency

Why Green Power?

The same reason that our parents and grandparents signed up for electric service approximately 70 years ago - To ensure a better way of life for future generations.

The cost? Well, that depends on the amount a member wants to contribute. Under the program, a member may purchase 100 kilowatt-hours of green power for \$5 or other blocks up to 2,000 kilowatt-hours for \$100.

Skeptics may feel that \$5 is too much. What if our parents and grandparents felt that way? Needless to say, we would not enjoy the lifestyle that we, as Arkansans, have come to enjoy. It might surprise you to know that \$5 in 1937 equals approximately \$72.55 in 2008.

What were the first cooperative members promised by their local electric cooperative? They were promised safe, reliable, reasonably priced electricity.

Today, members are still promised safe, reliable, reasonably priced electricity. However, they have the opportunity to assist in increasing the use of renewable energy, which is very costly to develop. The GreenPower program allows members to further invest in protecting the environment and ensuring that Arkansas' natural resources are preserved.

Was the \$5 worth it to our parents and grandparents? Are you willing to make this type of investment for your children and grandchildren?



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Generating Station

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Energy Efficiency

LED Lights, Holiday Energy Savings

Consider using LED lights during the holiday season. LEDs use 98 percent less electricity than conventional painted or ceramic bulbs. [Click here](#) for more information.

Tips to help control energy consumption and costs.

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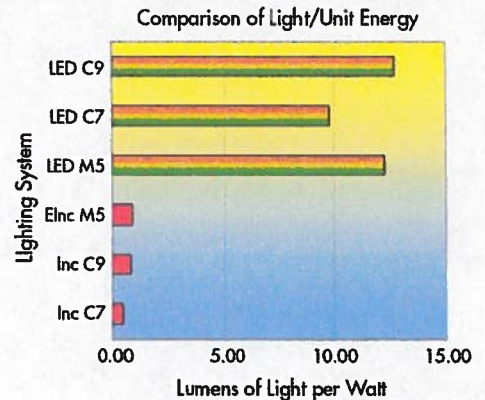


A Bright Idea: Energy Efficient Holiday Lighting



LED (light emitting diode) holiday lights are a shining example of the fruits of research and development efforts to increase electrical energy efficiency. Consider the advantages LEDs have over traditional incandescent lights:

- **Efficient** – LEDs save up to 98% of the electricity that is needed to power conventional painted or ceramic coated bulbs.
- **Environmentally friendly** – The low electricity use of LEDs means less carbon emissions, and manufacturing LEDs is more environmentally friendly as well. They require no glass or tungsten, since LEDs do not have a filament like incandescent bulbs; electron movement in semiconductor chips is what causes illumination.
- **Durable** – LEDs are encased in hard-to-break plastic versus the more fragile glass of incandescent lights. Because the LED is electronic, its lifetime is up to 10 years.
- **Practical** – LEDs come in standard packaging of 25- to 100-bulb strands that can be connected together to provide a seamless string. The long life of LEDs means that replacing bulbs will be rare, reducing maintenance.
- **Safe** – LEDs generate much less heat when they operate so they are cool to the touch, and are less likely to overload a circuit.
- **Attractive features and colors** – LEDs come in traditional shapes, sizes, and colors. LED strings with desired features such as blinking and flickering are also available.



Is it worth paying up to 100 times more for power for incandescent holiday lights? The lights shown on the left in each photo are efficient LEDs and those on the right are conventional incandescent lights.



M5 Minilight Bulbs



C7 Candle Flame Bulbs

LED holiday lights are typically a little more expensive to buy than their incandescent counterparts, but they virtually pay for themselves in the first year's electricity savings, and thereafter they are the gift that keeps on giving.

- Remember the "Christmas Vacation" movie character Clark Griswold, who lit his house with 25,000 bulbs? His electricity bill would drop from \$2,400 to \$50 if he used energy efficient C9 LED bulbs.
- But, everyone can save by using LEDs. The electricity cost to light a holiday tree with LEDs is 13 to 17 *cents* per season, compared to 6 to 10 *dollars* for incandescent lights. Those who put up seasonal outdoor lighting displays realize even greater savings.

Green holidays – the potential savings if all the seasonal minilights were to be switched to LEDs:

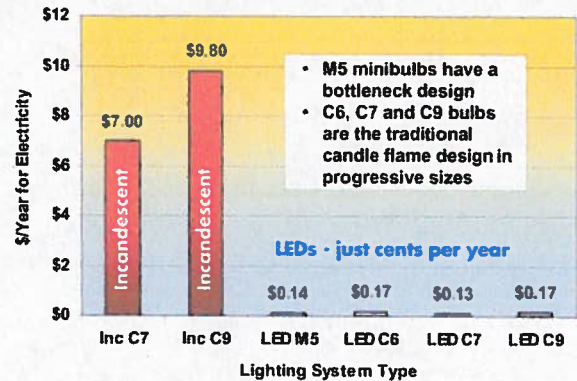
- Electricity costs savings would exceed \$250,000,000 – that's a lot of toys, turkeys and ties.
- Carbon emissions would be reduced by 400,000 tons per year – that makes for a cleaner, greener holiday.

Many cities and organizations across North America are switching to LEDs for their holiday displays. Some municipalities and utilities provide incentives for residents to switch as well, making for happier holidays for bill payers and taxpayers alike. For example:

- Walt Disney World wired Cinderella's Castle with over 200,000 LEDs, producing savings of thousands of dollars. With lighting decorations being used year round in many cases, switching to efficient LEDs becomes even more compelling.
- The Times Square ball that descends every year to ring in the New Year will be fully illuminated by LED lighting. Even though it's twice as bright as the old ball, it will use about half the energy.
- The City of Boulder, Colorado is switching to LEDs for its Downtown Pearl Street Mall. Its citizens can go to a lighting exchange kiosk on the Mall to swap their traditional, working holiday lights for LEDs for \$5 each (about half price). The old lights will be recycled by the city.
- Anaheim's municipal utility offers gift cards to Home Depot, Starbucks, or Borders to help rebate the cost of LEDs: \$10 cards for 25-150 lights, and \$20 cards for more than 150 lights.
- Efficiency Maine, a program of the Maine Public Utilities Commission, provides downloadable in-store coupons worth \$1.50 per LED string.
- Minnesota Power offers instant in-store rebates of \$3.00 for LED holiday lights.

EPRI hopes you enjoy the pleasures of a traditional holiday by using lighting that increases efficiency, saves money, and preserves our environment for future generations. Deck the halls with boughs of holly – and LED lighting.

Holiday Tree Electricity Lighting Cost



1 Navigant, 2003, March 2006.

2 Based on .39 pound carbon per kWh, America Solar Energy Society

3 Sources: USA Today, November 16, 2007, pg. 7D. WCBS News, <http://www.wcbs880.com/pages/1049103.php?> Boulder Daily Camera, November 18, 2007, pg. 12B. City of Anaheim, <http://www.anaheim.net/section.asp?id=54>. Efficiency Maine, <http://www.energymaine.com/>. Minnesota Power, http://www.mnpower.com/energystar/special_offers/index.htm

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Tips to help control energy consumption and costs.

Our commitment to providing environmentally sound power resources.

Energy Efficiency

Old Appliances

Major home appliances are not meant to last forever. Most major appliances have a planned obsolescence of 10 years. If a major appliance provides more than 10 years of service, a consumer has certainly gotten his money's worth ... or have they?

Most would likely admit if the refrigerator is not broken, there is no need to fix it. Also, many homeowners will not consider replacing appliances until the kitchen needs remodeling or they are moving into a new house. Homeowners often will take the repair approach because the repair cost is less expensive than purchasing a replacement unit.

The reality is as appliances age, their overall energy efficiency can drop significantly due to aging parts, malfunctioning controlling devices, bad seals and other components. For instance, a bad thermostat on a dryer will cause it to continue drying even when clothes are dry. A bad seal on the freezer or refrigerator will cause the unit to cycle frequently. Speaking of old refrigerators and freezers, many Americans keep one or more in the garage, which is an unconditioned air space. During warmer months, the unit cycles much longer in order to keep its contents cold.

Older refrigerators equate to additional energy consumption. Running an additional older model unit can consume up to 66 percent more energy than a newer model that is ENERGY STAR® equivalent. Even though a consumer may have gotten their money's worth out of an appliance, you may be spending far more on electricity than the unit is worth. For instance, it is not uncommon for older model refrigerators and freezers to average \$1 per day to operate. It is not always obvious when an older appliance has become an energy waster. But it is a safe bet that if a major appliance is more than 10 years old, there is an ENERGY STAR® replacement available that can save money over the long haul.

Today's technology is a friend when it comes to energy efficient appliances. Older motor and controller technology is less efficient than today's technology. For instance, programmability and energy saving functions are available on many appliances. Energy-efficient clothes dryers are available with humidity sensing controls that cause the dryer to shut down when clothes are actually dry. Energy-efficient washing machines have water saving features, motors, and a high-speed spin cycle that removes virtually all of the water from clothing. This allows for less drying time.

For a complete list of energy saving appliances, visit www.energystar.gov and click on "Appliances" in the menu.





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Energy Efficiency

Electric Cooperatives of Arkansas Team with Doug Rye to Build Energy-Efficient Homes

Building an energy-efficient home is easier than one might think. Doing so requires additional planning and effort on the front end before breaking ground. That's where Doug Rye and the Electric Cooperatives of Arkansas can assist.

"Any home can be built in a more energy efficient manner," said Doug Rye, a well-known energy efficiency expert who is a consultant for the Electric Cooperatives of Arkansas' model home program. "If you are trying to educate people, why don't you build a house that they can see, touch, and feel?"

So the Electric Cooperatives of Arkansas teamed up with Rye in 1997 to build a series of energy-efficient homes across Arkansas. The homes incorporate proven energy efficiency measures, components and appliances. Each home is guaranteed not to exceed a predicted amount in heating and cooling costs.

How does the program work? First, the builder, contractors and homeowner sign a contract agreeing to comply with installation and construction of required components and measures. They also agree to follow program guidelines. A hold harmless form is also required. Energy efficiency experts from a local electric cooperative and statewide organization supervise and monitor each component through the entire construction process. Photography and video are utilized to document construction and installation. The homeowner also agrees to allow the sponsoring electric cooperative to host a public open house for one weekend. Also, Doug Rye will host his weekly radio show "Home Remedies" from the home and field questions from visitors.

According to model home program coordinator Bret Curry, the model home program is perfect for educating electric cooperative members about energy efficiency.

"We also teach members that anyone can build any new home to perform energy efficiently, with exceptional comfort and with very reasonable utility bills," Curry said.

Contact the Electric Cooperatives of Arkansas for a complete packet of energy efficiency construction literature at communications@aeci.com.

Components for Building an Energy-Efficient Home

Established components and guidelines are utilized to ensure that a model home meets the highest standards of energy efficiency. It is far more cost-effective to incorporate energy efficiency into a new home than to retrofit later.

When building a new home, remember the law of thermodynamics, which says heat moves from high temperature regions to low temperature regions. In other words, heat always moves to cold. So in Arkansas, the hot summer temperatures always attempt to gain access to an air-conditioned home. Conversely, the warmed air in a home tries to escape during the winter.

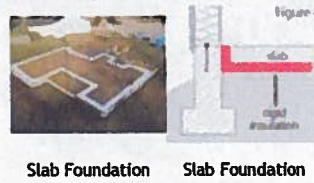
The following components and measures create obstacles and dramatically impede the law of thermodynamics. The effect equates to lower utility bills and a more comfortable home.

Foundation

If the foundation is a concrete slab, insulate perimeter of slab using 1" extruded polystyrene foam board. Place it between the outer edges of the slab and foundation. It should extend vertically 4 inches and 24 inches horizontally under the edge of the slab.

If the foundation has a crawl space, insulate inside of stem wall with foam or cellulose, a heavy plastic or vinyl ground cover should be used as a moisture barrier, and close all vents. If this method is used to insulate a crawl space, it is critical that the elevation of the ground in the crawl space be higher than the ground elevation outside the crawl space. It is also critical there are no standing water or moisture problems within the crawl space. Insulating the slab keeps its temperature similar to that

of the conditioned space. Insulating and sealing the crawl space stops sharp contrasts in temperature and humidity. It's similar to an insulated basement.



Slab Foundation Slab Foundation

Hot Water Lines

Hot water lines in a concrete slab must be insulated with foam tubing or equal. A concrete slab acts as a heat-sink and will cause the heat from non-insulated hot water lines to quickly dissipate into the slab. Remember, a concrete slab is nearly the same temperature of the ground, unless of course it's insulated. A homeowner spends money to heat water; keep it hot and ready for use by insulating properly.



Insulated Hot Water Line

Framing

Energy experts have determined standard 2" x 4" framing and proper insulation may be used in high efficiency home construction. However, conventional corner and tee framing are prohibited. Past construction methods left corners and partition walls without proper insulation, causing moisture, mold and mildew to develop. Corners and tees are areas that can affect the R-value of the exterior wall. The framing illustration shown is required to maximize insulation value in those areas. Framing energy corners and tees requires less lumber and does not diminish supporting strength.



Correct Energy Corner



Correct Energy T



Incorrect Energy Corner



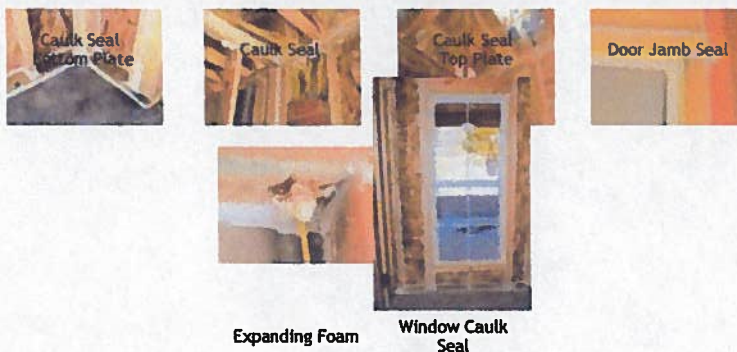
Incorrect Energy T



Proper Energy T Corner Framing

Caulking and Foam Insulation

An important measure to achieve energy efficiency is reducing air infiltration. Inexpensive caulking and foam sealants can seal air voids. Begin by using expanding foam to seal electrical and plumbing penetrations made in the top and bottom plates, and the inner and outer walls. On outside walls, caulk joints where two boards meet including top and bottom plates. IF IN DOUBT, CAULK IT. Caulking should be performed from the inside of the dwelling with a good silicon-based latex caulk. When caulking around doors and window jambs, use non-expanding foam. Expanding foam may exert pressure on the window or door frame and cause damage.



Windows

Windows should be constructed from wood or vinyl, double or triple glazed, and with low-e glass. A U-factor and solar heat gain coefficient (SHGC) of .31 or lower are recommended. Look for windows with a decal indicating they were tested by the (NFRC) National Fenestration Rating Council. Low-e windows reflect heat back into the conditioned area and are great in the winter. U-factor is the inverse of R-value. So, a lower U-factor is good and indicates the window has a low heat loss rate. SHGC is a measure for the amount of solar radiation that passes through a window. Hence a lower SHGC is better for the southern climate.



Window NFRC

Cellulose or Foam Insulation

Insulation is intended to retard the flow of heat from warmer areas to colder areas. Proper insulation pays for itself by reducing the equipment size required to heat and cool the home. It also reduces overall heating and cooling costs. Cellulose or foam insulation is required. Fiberglass is prohibited. An R-45 is required for the attic. Currently, cellulose insulation is far less costly than foam insulation. Cellulose insulation made with recycled newspaper began in the 1950s and came into general use in the U.S. during the 1970s. Cellulose insulation by its very nature is an environmentally friendly green product. It's treated with borate to provide the highest Class I fire retardant rating. Also, cellulose is insect resistant and provides noise reduction. Damp spray applied cellulose is used for applying cellulose to new wall construction. The only difference is the addition of a very small amount of water to the cellulose while spraying. In many cases the contractor also mixes in a very small percentage of adhesive or activates a dry adhesive present in the cellulose. Wet spray allows application without the need for a temporary retainer. In addition, wet spray allows for an even better seal of the insulated cavity against air infiltration and eliminates settling problems. Damp-spray installation requires that the wall be allowed to dry for a minimum of 24 hours (or until maximum of 25 percent moisture is reached) before being covered.



Cellulose Wall Insulation



Cellulose Install



Foam Insulation



Foam Wall Insulation

House Breathing

“House breathing” is a term that has been around for decades. The thought is a breathing house creates a better living environment. However, it's quite the contrary. House breathing is actually uncontrolled air infiltration that can rob energy savings and comfort from your home. Furthermore, excessive air infiltration introduces dust, dirt, pollen, humidity and other allergens into your home.

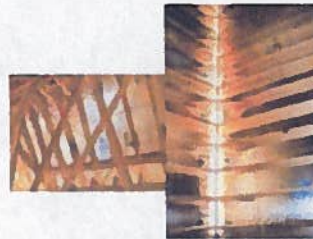
Not to mention the heating and cooling unit is working overtime to keep the living areas comfortable. No home can be built air-tight nor should it be. Following these building guidelines enables the proper construction with acceptable natural air changes per hour.

Metal Ductwork

Metal ductwork is required. Each joint must be sealed with duct mastic or mastic tape. Flex duct is prohibited. If the ductwork is in the attic, when possible lay the ductwork on the ceiling joists and cover as much as possible with insulation. Installation in the crawlspace is acceptable. Rigid PVC ductwork is acceptable in concrete slab application. Sealing the ductwork properly keeps it from becoming disconnected and assures virtually 100 percent of the conditioned air stays inside the conditioned building envelope. The number one area your energy dollars are spent is for heating and cooling. Keep the conditioned air inside the duct and your building envelope by sealing them properly.

Radiant Barrier Roof Decking

Radiant barrier roof decking is required. The shiny foil backing is installed facing downward or toward the attic. Face the shiny side outward for gable applications. During the hottest months in Arkansas, a felt-shingled roof can reach temperatures in excess of 160 degrees. That is why an attic is unbearable in the summertime. However, radiant barrier roof decking can reduce internal attic temperatures up to 50 degrees.



Radiant Barrier

Radiant Barrier

Insulated Contact Air Tight Recessed Lights

If recessed lights are used, they must be insulated contact air tight (ICAT) rated fixtures. Using ICAT fixtures does not enable air infiltration and they can be covered with insulation.

ICAT Recessed
Fixture

Lighting

Compact fluorescent lamps (CFL) are recommended over standard incandescent bulbs. CFLs last up to 10 times longer than their counterpart. They also cost 75 percent less to operate and produces less heat. It surprises some consumers to learn that the energy required for standard incandescent bulbs produces 90 percent heat and 10 percent light. Imagine a hot summer day with a house full of incandescent bulbs turned on at the same time. This represents a "heat gain." During the summer, heat from Mother Nature is constantly trying to get into an air-conditioned house. Then to add insult to injury, the heat gain from the incandescent bulbs, appliances, people, pets, cooking and other sources cause the air-conditioner to work overtime. Installing CFLs can dramatically reduce additional heat gain into a home.

Ridge Venting

Ridge vents with continuous soffit venting are required where applicable. Ventilating the attic space creates natural convective air flow and allows moist air to escape. A properly ventilated attic will not enable the formation of mold or moisture. Plus the attic stays cooler during the summer months.



Ridge Venting

Marathon Water Heater

The high energy-efficient Marathon water heater manufactured by Rheem is required. The Marathon has a lifetime warranted tank and is guaranteed to never leak or rust as long as a person owns their home. Units have an energy factor of .91 or higher. Contact your local electric cooperative to purchase a unit. For additional details, visit www.marathonheaters.com.



Marathon

Heating and Cooling

The home must be heated and cooled with an air-source heat pump or geothermal system. The minimum SEER rating for the heat pump is 13 SEER. A Manual-J load calculation must be conducted to determine the amount of heating and cooling required for the home.

To learn more about geothermal heating and cooling and the installation process, [click here](#).



Heating and Cooling Geothermal

Return Air

Ductwork sizing is important to obtain the proper cubic feet of supply air for each room. Construction software parameters for air infiltration must be set to "Best" to assure proper sizing. The return air must have two square feet for each ton of heating and cooling. For instance, a three-ton unit must have six square feet of return air. If there is not enough area available for properly sized return air, two return air systems may be utilized. A heating and cooling system can only supply the same amount of air that can be obtained from the return.

Supply Registers

Supply air registers should be located toward the outside walls, and air should wash the outside walls when the unit is running.

Thermostat

Programmable or set-back thermostats are not required. Homeowners should tell the heating and cooling contractor what temperature they are most comfortable during the winter and summer. Doing so enables the correct design temperature during the Manual-J load calculation. Also, when using air or ground-source heat pumps, set the thermostat and refrain from making adjustments. Simply set it to the desired temperature. Do not locate the thermostat on outer walls, near doors and windows, and away from major appliances. Consult a heating and air contractor for additional information.

Garages

The garage walls and ceiling must be insulated. The garage door must also be insulated.

Cook-tops

Cook-tops must be vented to the exterior of the home and not into the attic or living space. Doing so vents latent heat/moisture outside the conditioned air space. Venting into the living space causes the cooling unit to work harder in order to remove the humidity. Venting into the attic can cause moisture, mildew or mold issues if the home has inadequate ventilation.

Humidity-Sensing Exhaust Fans

Humidity-Sensing exhaust fans must be installed in bathrooms to remove excess moisture. Venting to the outside is the preferred method. Excess moisture inside the conditioned air space can lead to the formation of mildew and mold.



Humidity Sensing Exhaust Fan

Electric Consumption Metering

The sponsoring electric cooperative may meter electric consumption of the Marathon water heater and heating and cooling system separately. Doing so enables the utility to monitor consumption and the guaranteed performance.



Dual Metering



Today is the day -- the 40th anniversary of the signing of legislation that made the Buffalo River the nation's <http://www.aecc.com/energy-efficiency/model-home-program/>

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Standby Power

Most experts agree that standby power or phantom loads are electricity used by appliances and equipment while they are switched off or not performing their primary function. That power is consumed by power supplies which are those black cubes sometimes called "vampires."

They convert AC into DC. Standby power use is also caused by circuits that continue to be energized even when the device is "off." Big-screen televisions are an example of a consumer electronic item that creates this unsuspected energy consequence.

Almost any product with an external power supply, remote control, continuous display (including an LED), or charges batteries will continuously draw power. Sometimes there is no obvious sign of continuous power consumption, and a meter is needed to be certain. The obvious are computers and other consumer electronic items left on at all times.

Nobody knows for sure exactly how much power is lost due to standby losses. Yet it has been determined that typically 5-10 percent* of residential electricity in most developed countries and a rising fraction in the developing countries, especially in the cities is lost. Standby power in commercial buildings is smaller, but still significant.

Reducing standby power in a home can be difficult, yet not impossible. Here are some suggestions:

- If an appliance or device is not used frequently, simply unplug it.
- Unplug battery-charging devices when not in use.
- Use switchable power strips for clusters of computer and television equipment. Zero consumption can be reached with the flick of a switch.
- Purchase ENERGY STAR® appliances. Most are significantly more energy efficient.
- Buy a low-cost watt-meter, measure the usability of devices and take action. This exercise can pay back the cost of the meter in savings. The Kill-a-Watt and Power Cost Monitor are two user-friendly versions.

Standby power is necessary for many functions in a home. Some include monitoring temperature and other conditions with refrigerators and freezers and maintaining signal reception for wireless network signals, telephones, displays, clocks and more. So eliminating standby power is next to impossible. Yet learning how to efficiently monitor standby power will help take control of energy consumption and your electric bill.

[Click here](#) for a complete list of ENERGY STAR® qualified products.

[Click here](#) to learn more about appliance energy consumption.

**Lawrence Berkley National Laboratory*

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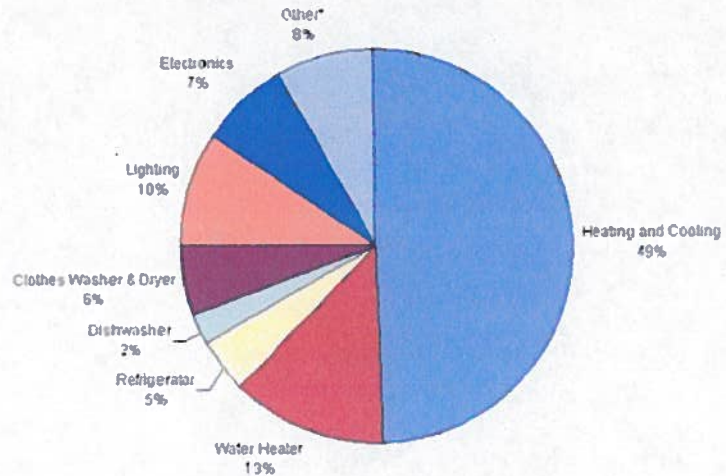
[Reading Your Meter](#)

[Touchstone Energy Saver Tools](#)

Energy Efficiency

Where Does My Money Go?

Annual Energy Bill for a typical Single Family Home is approximately \$2,000.



Source: Residential Energy Consumption Survey, 2001

Average price of electricity is 10.6 cents per kilo-watt hour. Average price of natural gas is \$12.42 per million Btu.

* "Other" represents an array of household products, including stoves, ovens, microwaves, and small appliances like coffee makers and dehumidifiers.

Tips to help control energy consumption and costs.

Our commitment to providing environmentally sound power resources.



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Energy Efficiency

Energy Costs Adjustments

The Fuel Adder

Why is a fuel adder on my bill?

Perhaps explaining what a fuel adder is will help answer the question better. A fuel adder surcharge is implemented when the cost of producing electricity increases. Your electric cooperative must add the temporarily high surcharge to your bill to cover the additional costs of generating electricity.

Why are there additional costs with making the electricity?

Good question. The rising costs of fuel, primarily natural gas, that is used to generate electricity is the primary driver behind rising electricity costs.

Is there anything that can be done about the fuel adder charge by my local cooperative?

Unfortunately, no. As a not-for-profit organization, you can rest assured your local electric cooperative will never make a profit off of our members' added burden. By law, a fuel adder must go directly toward covering the added costs. Nothing more, nothing less.

Is this just a problem in Arkansas?

While our state often benefits from a low cost of living, energy prices are rising nationwide. For some natural gas and propane users, their energy bill will increase at a higher rate. For members like you, your electric cooperative has a proven record of managing costs to keep rates as low as possible. That commitment to you will never change.

What can I do to keep unnecessary costs from attaching to my monthly bill?

Contact your electric cooperative for energy-saving tips on keeping your electric costs down. It takes working together to make the best use of resources. As your friendly, local cooperative, we do everything in our power to provide safe, reliable electricity and service to you.

Energy-Saving Tip

Close all draperies and shades at night to reduce heat loss. Drapes save energy only if they fit tightly around the window frame. This usually means a valance at the top, side guides and a weighted hem.

Electricity in Arkansas

What does electricity come from?

There are a number of ways to produce electricity. The most common methods include using coal or natural gas at generation facilities to generate electricity.

Why does this matter to me?

When the costs of fuels increase - and they have skyrocketed recently - it can trigger a "fuel adder" charge on your bill to cover the extra costs incurred by your local electric cooperative to deliver power to you.



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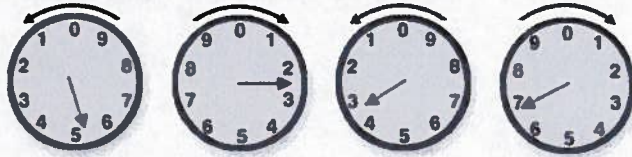
Our commitment to providing environmentally sound power resources.

Energy Efficiency

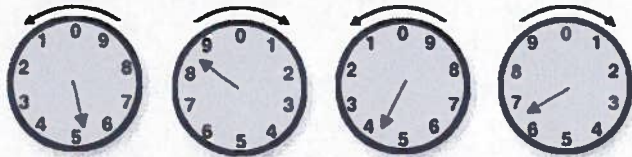
Reading Your Meter

An electric meter will typically have four or five dials on it. The four-dial meter is the most common. The reading for each dial is the last number passed by the pointer. In other words, when the pointer is positioned between two numbers, record the lower of the two numbers. For example, if the pointer is between five and six (regardless of which way the pointer turns), the reading is five. The dials are read and recorded from left to right. The consumption during any interval can be calculated by taking the difference between the previous reading and the current reading of the dials. If the previous reading was 5,236 kWh, the usage would be 610 kWh.

Example:
Previous Reading: 5,236 kWh



Current Reading: 5,846 kWh



Usage during the period: 610 kWh

Note: On a four-dial meter, looking from left to right, the numbers on the first and third dial are in a counter-clockwise arrangement. The pointer on the first and the third dial also moves in a counter-clockwise motion. The numbers on the second and fourth dial are arranged in a clockwise arrangement on the dial. The pointer on the second and fourth dial also moves in a clockwise fashion.

The five-dial meter works in the same way. On a five-dial meter, looking from left to right, the first, third and the fifth dial's numbers are in a clockwise arrangement on the dial. The pointer for the first, third and fifth dial also move clockwise. The second and fourth dials are arranged and move counter-clockwise.



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Touchstone Energy Saver Tools




Tips to help control energy consumption and costs.

Our commitment to providing environmentally sound power resources.

Energy Efficiency

Touchstone Energy Saver Tools

	<p><u>101 Ways to Save Energy</u> Your Touchstone Energy Cooperative has compiled this list of low-cost/no-cost energy-saving measures to help you better manage your home's energy costs.</p>
	<p><u>Energy Savings Home Tour</u> There are many things you can do in your home to make it more energy efficient. Take the Touchstone Energy Home tour to find ways to save energy. After you're done with the tour, you can download a copy of Touchstone Energy's popular Home Energy Savings Guide for more energy efficiency tips and resources.</p>
	<p><u>Light Bulb Energy Saver</u> Switching from regular incandescent light bulbs to compact fluorescents can help make your home more energy efficient and help save you money. Find out how much you can save by using the Touchstone Energy Light Bulb calculator.</p>
	<p><u>Water Heaters Saver</u> Learn which is the best type of water heater to have, and why.</p>
	<p><u>Home Energy Saver Audit</u> This robust online audit will help you identify the best ways to manage and save energy in your home. The resource quickly calculates home energy use based on a detailed description of your home, its appliances and geographic location.</p>
	<p><u>Home Energy Savings Guide</u> You have the power to control your energy costs. This Home Energy Savings Guide is a starting point to get you on the way toward better energy management for your home. In this booklet you'll find valuable tips designed to create greater home comfort and improve performance. Learn how to save energy in all areas of your home. There is a list of additional resources located at the end of this booklet.</p>
	<p><u>Seal the Deal</u> One of the best and easiest ways for consumers to save on their energy bills</p>

	<p>is to make sure that their home is properly sealed. Hidden cracks and improper insulation in your home can amount to as much heat loss as having a window open all year round. That is why Touchstone has teamed up with ENERGY STAR® to bring you "Seal the Deal." Seal the Deal is a short do-it-yourself video that shows what you can do to seal those small cracks and insulate your house to reduce your energy bill.</p>
	<p>Simple Tips Stopping energy leaks is a lot easier than you think. It doesn't require a lot of time or a lot of money. Here are a few tips from your local electric cooperatives...the energy experts.</p>
	<p>Commercial Energy Savings Guide This guide educates business consumers on ways to implement energy efficient practices.</p>



Today is the day -- the 40th anniversary of the signing of legislation that made the Buffalo River the nation's

Electric Cooperatives of Arkansas
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Ph: 501-570-2200
Email: communications@aecc.com

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101 Low-Cost / No-Cost Home Energy-Saving Measures



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Your Touchstone Energy
Cooperative has compiled
this list of low-cost / no-cost
energy-saving measures
to help you better manage
your home's energy costs.

Thanks for being our member.



For more helpful energy-saving hints,
visit www.tsesavers.coop



Water Heating

1. Set water heater temperature no higher than 120° F
2. For households with 1 or 2 members, a 115°F setting may work fine.
3. Install water-heater wrap per manufacturer's instructions.
4. Drain 1–2 gallons from bottom of water heater each year to reduce sediment build-up.
5. Install heat traps on hot and cold water lines when it's time to replace your water heater.
6. Insulate exposed hot water lines.
7. Limit shower length to 5–7 minutes.
8. Install low-flow shower heads.
9. Fix dripping faucets.
10. Don't let water run while you are shaving.
11. Don't let water run while brushing your teeth.

Laundry

12. Wash clothes in cold water. Use hot water only for very dirty loads.
13. Do only full laundry loads.
14. If you must do smaller loads, adjust the water level in the washing machine to match the load size, especially when using hot water.
15. Always use cold-water rinse.
16. Use bath towels at least twice before washing them.
17. Clean your dryer's lint trap before each load.
18. Make sure that the outdoor dryer exhaust door closes when dryer is off.
19. Verify dryer vent hose is tightly connected to inside wall fitting.
20. Check that the dryer vent hose is tightly connected to dryer.
21. Make sure dryer vent hose is not kinked or clogged.
22. Minimize clothes drying time; use moisture sensor on dryer if available.
23. Dry consecutive loads to harvest heat remaining in dryer from last load.
24. Consider using a "solar-powered" clothes dryer, an old-fashioned clothes line.



Kitchen

25. Use your refrigerator's anti-sweat feature only if necessary.
26. Switch your refrigerator's power-saver to "ON," if available.
27. Clean refrigerator coils annually.
28. Set the refrigerator temperature to 34°–37°F and freezer temperature to 0°–5°F.
29. Ensure gaskets around door seal tightly.
30. Unplug unused refrigerators or freezers.
31. Use microwave for cooking when possible.
32. When cooking on the range, use pot lids to help food cook faster.
33. If you are heating water, use hot tap water instead of cold.
34. Remember to use the kitchen exhaust fan when cooking and turn it off after cooking.
35. Let hot food cool before storing it in the refrigerator.
36. Rinse dirty dishes with cold water before putting them into the dishwasher.
37. Use cold water for garbage disposal.
38. Only run dishwasher when fully loaded.
39. Use air-dry cycle instead of heat-dry cycle to dry dishes.



A woman with dark hair, wearing a light blue button-down shirt, is smiling and looking upwards. She is holding a compact fluorescent bulb (CFL) in her right hand, positioned as if about to install it. The background is a solid, bright yellow color.

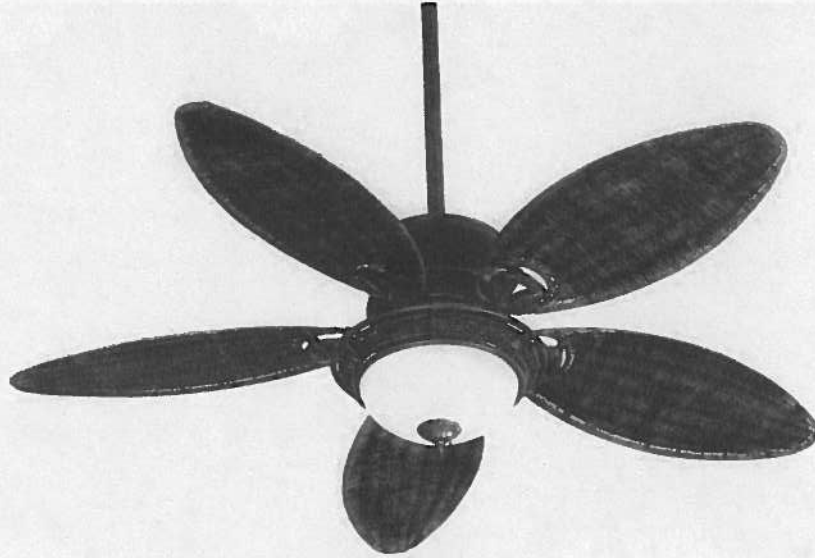
Lighting

40. Replace any light bulb that burns more than one hour per day with its equivalent compact fluorescent bulb.
41. Turn off unnecessary lighting.
42. Replace outdoor lighting with its outdoor-rated equivalent compact fluorescent bulb.
43. Use fixtures with electronic ballasts and T-8, 32-Watt fluorescent lamps.
44. Use outdoor security lights with a photocell and/or a motion sensor.

Miscellaneous

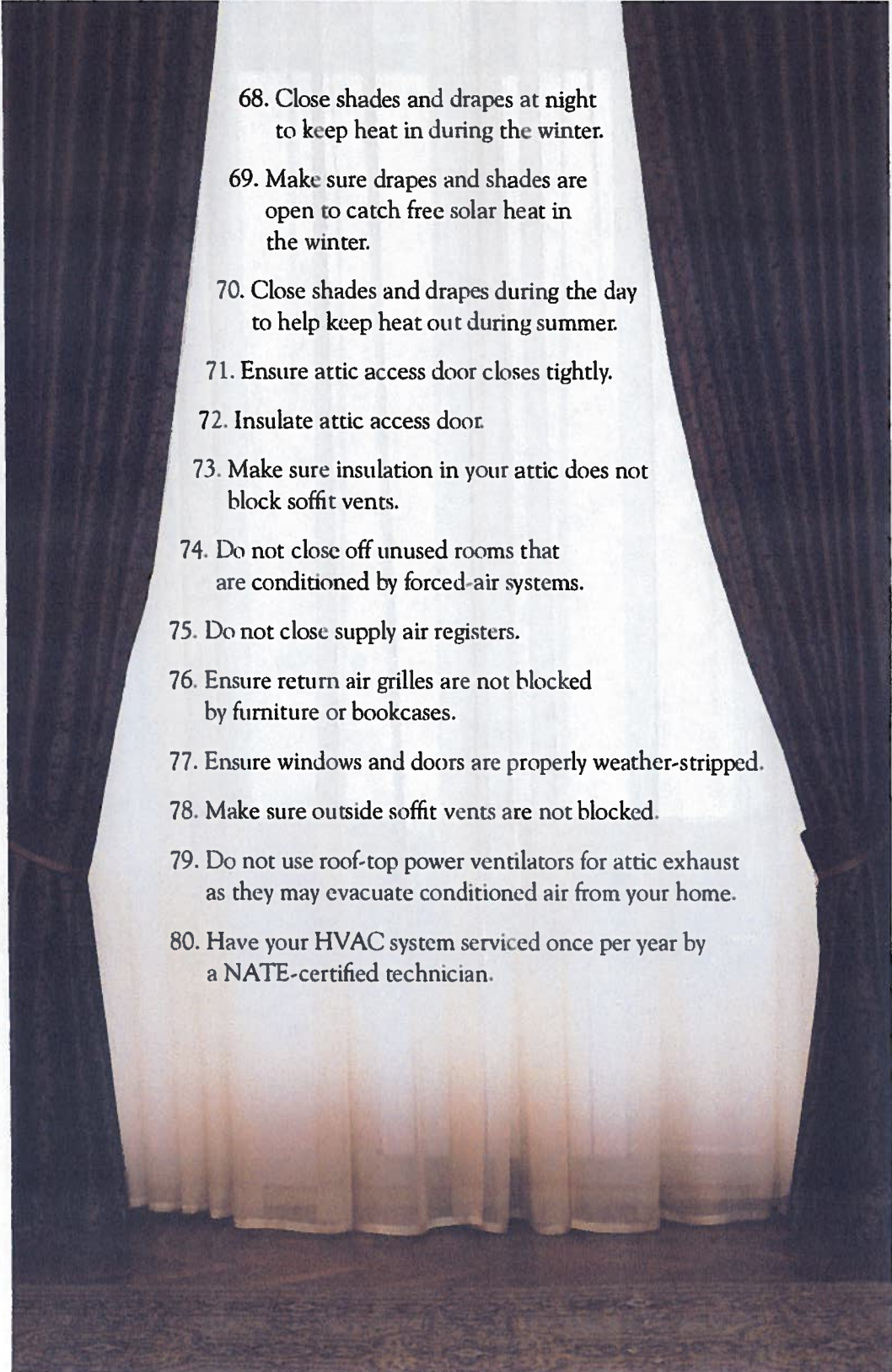
45. Turn computers and monitors off when not in use.
46. Make sure electric blankets are turned off in the morning.
47. Turn waterbed heater off when not needed.
48. Turn large-screen TV's off completely when not in use.
49. Turn off stereos and radios when not in use.
50. Remember to turn off hair curling irons and hot rollers.
51. Turn off coffee makers when not in use.
52. Turn off pool pump and/or heater when not needed.
53. Verify livestock water tank heaters are off when not needed.
54. Make sure heat tape is off when not needed.
55. Unplug battery chargers when not needed.
56. Ensure all new appliances you purchase are Energy Star-approved.



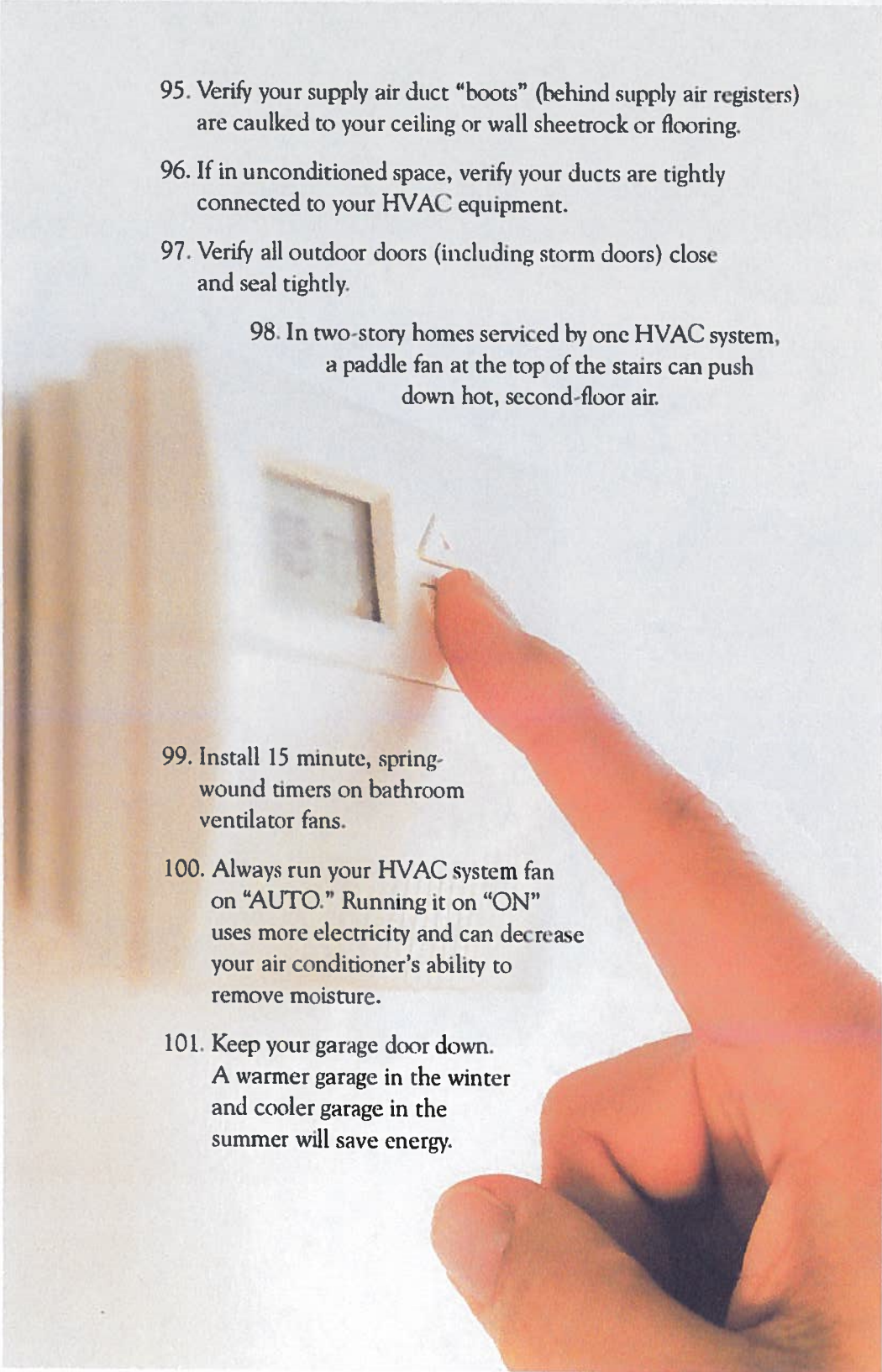


Heating & Air Conditioning

57. Set thermostats to 78°F in summer, 68°F in winter.
58. Run ceiling paddle fans on medium, blowing down in summer.
59. Run ceiling paddle fans on low, blowing up in winter.
60. Change HVAC filters monthly.
61. When installing new air filters, make sure they are facing in the correct direction. (Look for arrow on side of filter.)
62. When heating or cooling, keep windows locked.
63. Insulate electric wall plugs and wall switches with foam pads.
64. Caulk along baseboards with a clear sealant.
65. Close fireplace dampers when not burning a fire.
66. Caulk around plumbing penetrations that come through walls beneath bathroom and kitchen sinks.
67. Caulk electrical wire penetrations at the top of the interior walls.

- 
68. Close shades and drapes at night to keep heat in during the winter.
 69. Make sure drapes and shades are open to catch free solar heat in the winter.
 70. Close shades and drapes during the day to help keep heat out during summer.
 71. Ensure attic access door closes tightly.
 72. Insulate attic access door.
 73. Make sure insulation in your attic does not block soffit vents.
 74. Do not close off unused rooms that are conditioned by forced-air systems.
 75. Do not close supply air registers.
 76. Ensure return air grilles are not blocked by furniture or bookcases.
 77. Ensure windows and doors are properly weather-stripped.
 78. Make sure outside soffit vents are not blocked.
 79. Do not use roof-top power ventilators for attic exhaust as they may evacuate conditioned air from your home.
 80. Have your HVAC system serviced once per year by a NATE-certified technician.

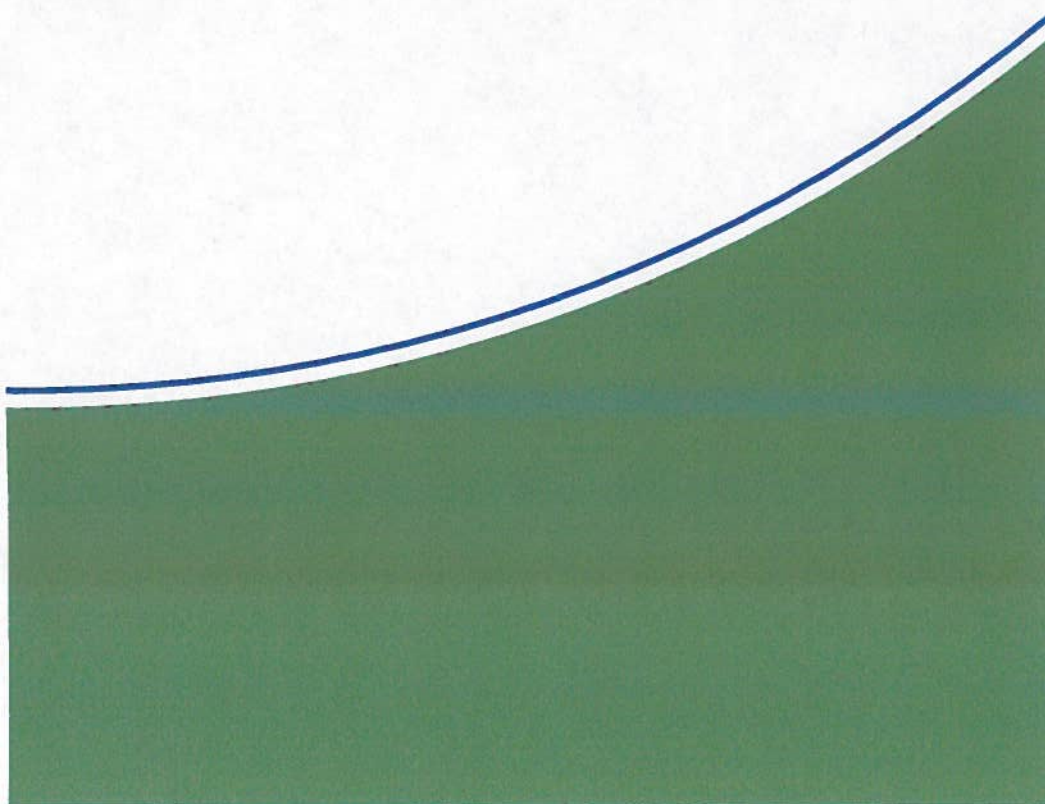
81. Monitor your home's relative humidity in the summer. If it consistently stays in the 60-percent range or higher, ask your HVAC technician about lowering your central air conditioning unit's indoor fan speed.
82. Ensure window A/C units are weather-stripped.
83. Ensure windows with window mounted A/C units have weather-stripping between the middle of the top and bottom pane.
84. Remove and clean window A/C filter monthly.
85. Keep "fresh-air" vents on window A/C units closed.
86. Minimize use of electric space heaters.
87. When using the fireplace, reduce heat loss by opening damper in the bottom of the firebox (if provided) or open the nearest window slightly.
88. Caulk around basement windows.
89. In a basement, seal the sill and band joist with durable caulking or foam sealant.
90. Ensure floor registers are not blocked with rugs, drapes or furniture.
91. Ensure your outdoor heat pump / air conditioning unit is kept clean and free of debris.
92. Outside your home, caulk around all penetrations including telephone, electrical, cable, gas, water spigots, dryer vents, etc.
93. Caulk around storm windows.
94. Use heavy-duty, clear sheets of plastic on the inside of windows to reduce the amount of cold air entering your home.

- 
- A close-up photograph of a hand pointing to a small hole in a white wall. The hole is located next to a light switch. The hand is in the foreground, and the background is slightly blurred, showing a wooden door frame.
95. Verify your supply air duct “boots” (behind supply air registers) are caulked to your ceiling or wall sheetrock or flooring.
 96. If in unconditioned space, verify your ducts are tightly connected to your HVAC equipment.
 97. Verify all outdoor doors (including storm doors) close and seal tightly.
 98. In two-story homes serviced by one HVAC system, a paddle fan at the top of the stairs can push down hot, second-floor air.

99. Install 15 minute, spring-wound timers on bathroom ventilator fans.
100. Always run your HVAC system fan on “AUTO.” Running it on “ON” uses more electricity and can decrease your air conditioner’s ability to remove moisture.
101. Keep your garage door down. A warmer garage in the winter and cooler garage in the summer will save energy.



Visit www.tsesavers.coop
for more money-saving tips.



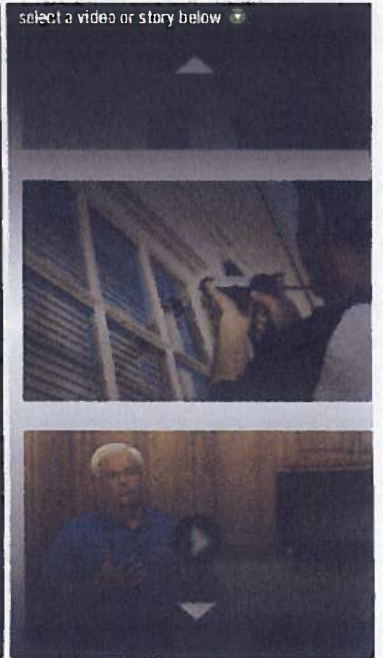


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WHAT CAN YOU DO?

Take it one step at a time. Choose an energy savings practice to see how the little changes add up.

GRAB THE INSULATION BLOWER TO HELP WEATHER THE ECONOMY.

TOGETHER SAVE CO\$

SEE WHAT YOUR ENERGY BILLS LOOK LIKE WHEN YOU FLIP A FEW SWITCHES.

TOGETHER SAVE CO\$

CLICK HERE for energy saving tips for manufactured homes.

TIP OF THE DAY Close shades and drapes during the day to help keep heat out in summer.

Click here to learn more about the TogetherWeSave.com *Tip of the Day* Smartphone App.

CFL Savings Calculator

It's a fact. Compact Fluorescent Lamps (CFLs) are energy efficient light bulbs that use less power than incandescent bulbs. They save so much energy that they pay for themselves in about six months, saving you \$40 over the life of just one bulb.

But why stop at one? See how much you can save with our CFL Savings Calculator. Just plug in the number of bulbs you plan to switch and watch the savings light up.

Which CFL Should I Use?

Different types of CFLs are made for different uses. When replacing your regular light bulbs with more energy efficient ones, use the [Energy Star Light Guide](#) to find the best fit and sample different color temperatures.

CFL Disposal

Because they contain very small amounts of mercury, CFL bulbs need to be disposed of properly. Many communities and home improvement stores have CFL recycling programs. Other communities accept used or broken CFLs in the trash when contained in two plastic bags.

To find your local CFL disposal and recycling options, visit the [EPA CFL Disposal web page](#).

What can you do?

Energy Saving Tips



Unplug it. Learn electronic tips to save energy.



Kid Zone

Fun, Games, Teacher Zone



A cool place where you can learn about electricity, energy savings and electrical safety.

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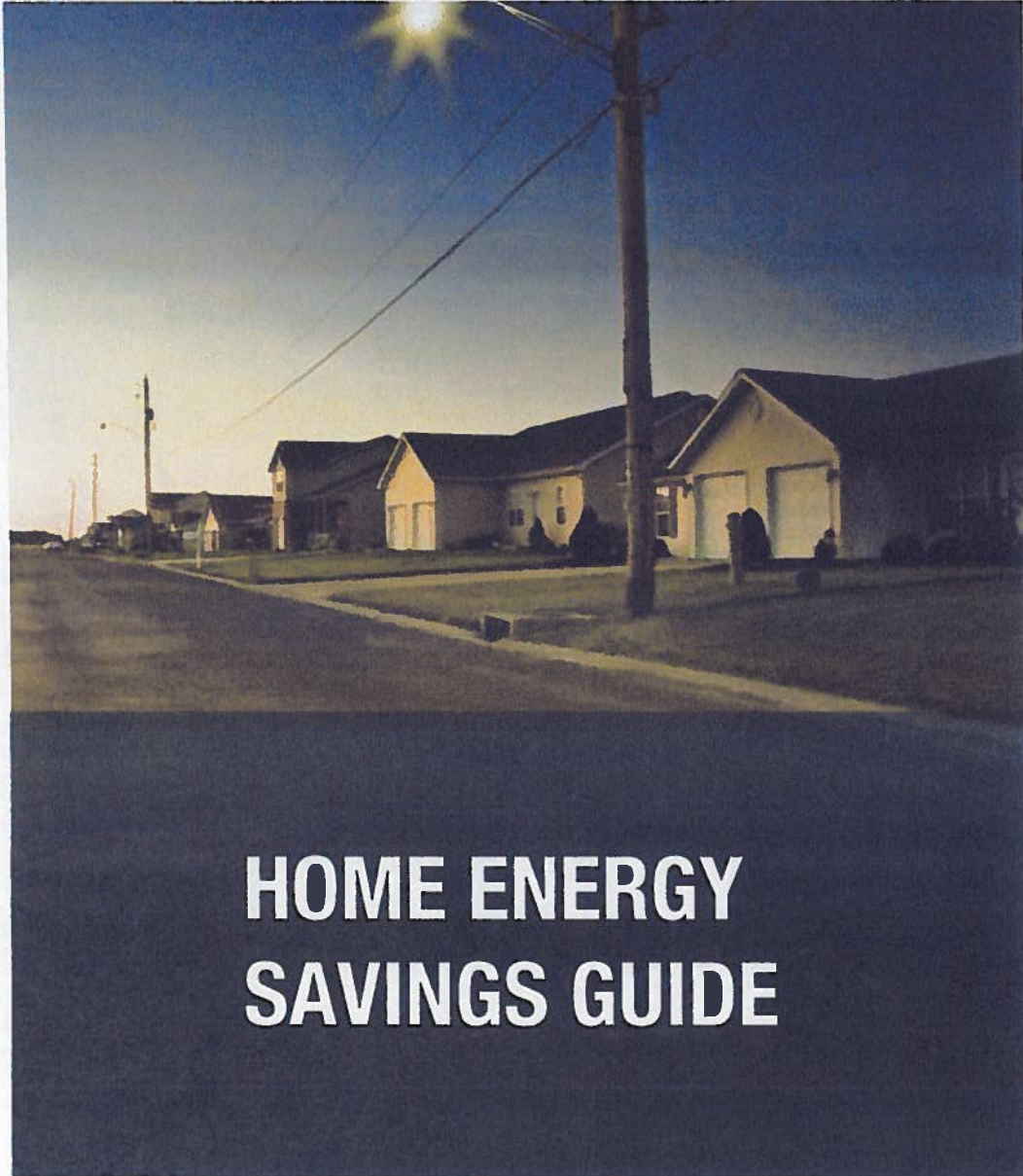
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HOME ENERGY SAVINGS GUIDE



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FIND OUT HOW THE LITTLE CHANGES ADD UP.

FLIP THE SWITCH. LOWER THE BLINDS. INSULATE YOUR ATTIC.
LOWER THE TEMPERATURE ON YOUR THERMOSTAT. THESE SOUND
LIKE SIMPLE TASKS. TAKE ALL OF THESE STEPS AROUND YOUR
HOME AND YOU CAN RACK UP BIG SAVINGS.

TOGETHER WE SAVE.

THIS HOME ENERGY SAVINGS GUIDE CONTAINS VALUABLE TIPS
ON HOW TO IMPROVE YOUR HOME'S EFFICIENCY.

FOR MORE INFORMATION, PLEASE CONTACT YOUR LOCAL
TOUCHSTONE ENERGY COOPERATIVE AND VISIT
TOGETHERWESAVE.COM.

HOME ENERGY SAVINGS

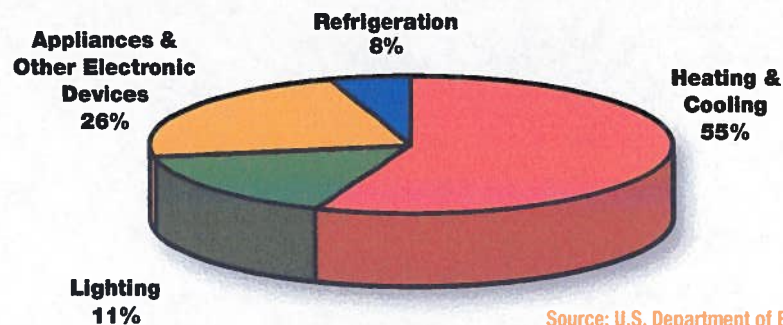
Your Touchstone Energy cooperative works hard to hold down energy prices. You, too, can play an important role in controlling your energy costs by evaluating your home and taking simple steps to trim unnecessary energy use. The following are some tips to help you reduce your energy costs.

HOME ENERGY COSTS

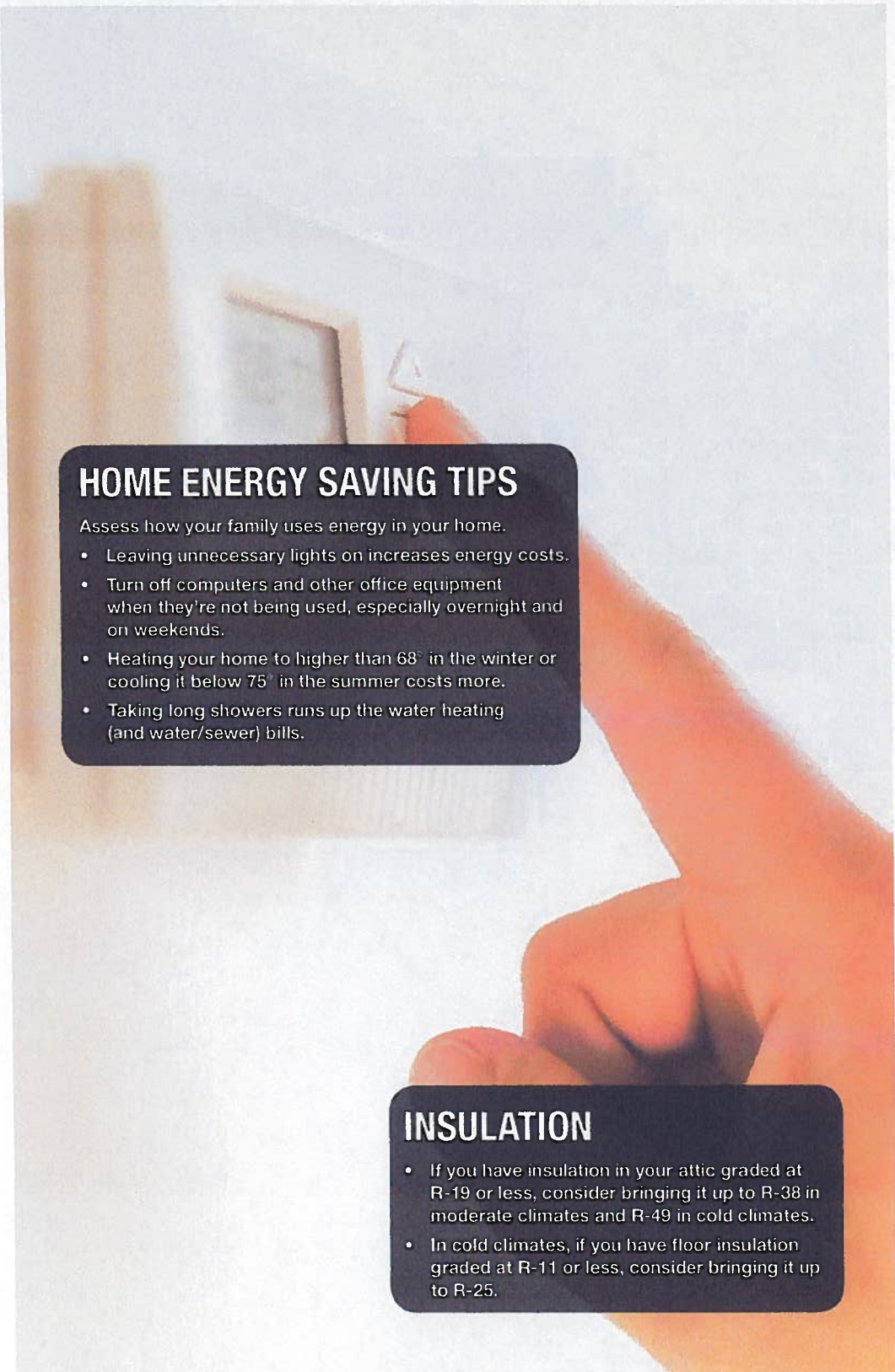
Get a clear picture of which parts of your home use the most energy.

- The first step in reducing home energy costs is to review last year's utility bills. Using the below national "percentage" averages, a homeowner who spent \$1,900 a year for home energy would have paid roughly:
 - \$1045 for heating and cooling
 - \$494 for appliances and other electronic devices
 - \$209 for lighting
 - \$152 for refrigeration
- When implementing energy-saving measures, remember, you cannot save more than you are spending.
- Contact your local Touchstone Energy cooperative to review your bills and receive a more accurate estimate. Go to TogetherWeSave.com for more information.

AVERAGE HOME ENERGY USAGE



Source: U.S. Department of Energy

A hand is pointing towards a light switch in a hallway. The background is a blurred hallway with a door and a picture on the wall.

HOME ENERGY SAVING TIPS

Assess how your family uses energy in your home.

- Leaving unnecessary lights on increases energy costs.
- Turn off computers and other office equipment when they're not being used, especially overnight and on weekends.
- Heating your home to higher than 68° in the winter or cooling it below 75° in the summer costs more.
- Taking long showers runs up the water heating (and water/sewer) bills.

INSULATION

- If you have insulation in your attic graded at R-19 or less, consider bringing it up to R-38 in moderate climates and R-49 in cold climates.
- In cold climates, if you have floor insulation graded at R-11 or less, consider bringing it up to R-25.



WINDOWS

Windows leak heat. If you have single-pane windows, consider doing the following:

- Tighten and weather-strip your old windows and then add storm windows.
- Replace your old single-glazed windows with new double-glazed windows.
- In colder climates, “low-e” coatings on glass can help reduce heat loss through windows.
- In hot climates, consider adding solar screening to west-facing windows that catch a lot of heating late in the day. Solar screening is sold at many home improvement stores.

AIR INFILTRATION

Air that transfers in and out of homes through cracks, crevices and holes increases energy consumption. Here are some helpful tips to avoid air infiltration:

- Seal around pipe penetrations coming through walls.
- During hot and cold weather, ensure windows are closed tightly and locked.
- Ensure weather-stripping around doors and windows is tight.
- When your fireplace is not operating, its flue should be closed tightly, with a sign hanging from the flue handle warning it is closed.
- Check the ceiling behind the cornice of built-in bookshelves for holes cut during construction.
- Drop-down stairways should fit tightly into the ceiling and be carefully weather-stripped.
- Whole-house attic fans should be sealed tightly during the winter.
- Make sure your outside dryer vent door closes when the dryer is not in use. This requires cleaning away lint accumulation periodically.

DRYERS

Drying clothes uses a lot of energy.

- Don't over-dry your clothes. If 50 minutes works, don't set to 70 minutes.
- Make sure to clean the inside lint filter before each drying cycle.
- Periodically check your flexible metal dryer vent hose to ensure it is still tightly connected and not kinked.

WATER HEATER

Your water heater works with many of your home's other systems.

- Make sure your water heater is set at the lowest point. Try setting it to 120°.
- Washing clothes with warm water and rinse with cold water.
- Overfilling your washer can increase your energy use.
- If your water heater is located in an unconditioned space, consider installing a thermal wrap around it. Take care to install it in accordance with the tank and wrap manufacturer instructions.



REFRIGERATION

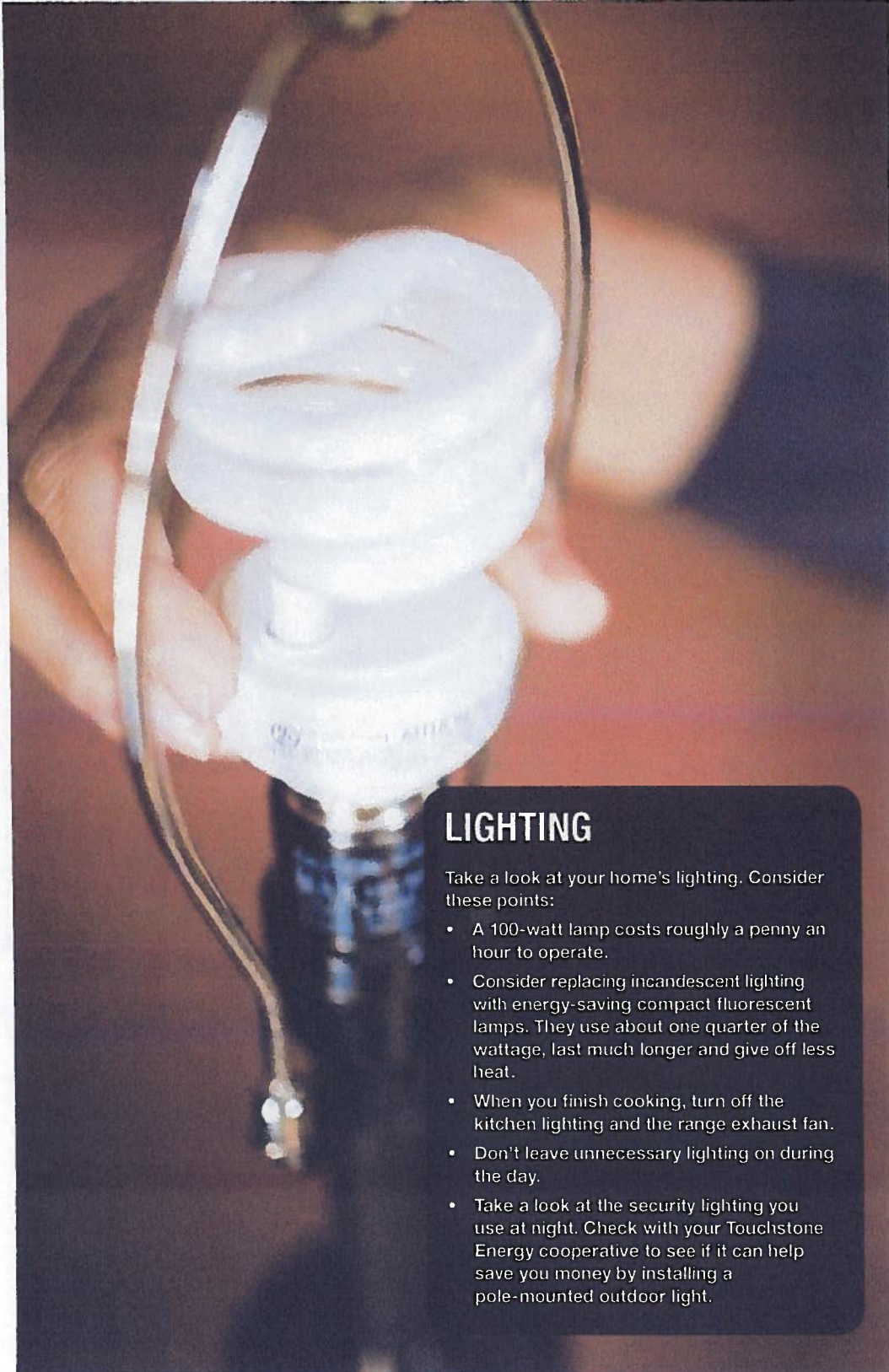
Trim your refrigerator's energy use.

- Make sure refrigerator and freezer seals fit tightly when doors close.
- Keep outside coils clean. Dirty coils make your refrigerator compressor work longer to remove heat.
- Setting your freezer below 0° uses extra energy.
- Setting your refrigerator below 37° uses extra energy.

HEATING & AIR CONDITIONING

Heating, ventilating, and air conditioning (HVAC) uses the largest chunk of your home energy dollar. Keep it running "lean and mean."

- HVAC systems should be checked to verify they are moving the correct amount of air. An HVAC technician can tell you if it is.
- Heat pump and air conditioning systems should be checked annually to verify they are properly charged, strictly in accordance with manufacturer guidelines.
- Inside and outside coils should be kept clean and free of debris.
- Gas furnaces should be tuned for maximum combustion efficiency.
- Return filters should be changed monthly.
- Have an HVAC technician check carefully for duct leaks. Leaks that are found should be sealed with fiberglass mesh and mastic sealant.



LIGHTING

Take a look at your home's lighting. Consider these points:

- A 100-watt lamp costs roughly a penny an hour to operate.
- Consider replacing incandescent lighting with energy-saving compact fluorescent lamps. They use about one quarter of the wattage, last much longer and give off less heat.
- When you finish cooking, turn off the kitchen lighting and the range exhaust fan.
- Don't leave unnecessary lighting on during the day.
- Take a look at the security lighting you use at night. Check with your Touchstone Energy cooperative to see if it can help save you money by installing a pole-mounted outdoor light.



SELECTING A CONTRACTOR

Some of the work you will want to complete will require the services of a contractor. When selecting a contractor, keep in mind that the best price is not always the best value. Here are some questions to ask when deciding who to use:

- **How long have you been in business?**
- **Can you provide proof that you are state-licensed and carry workers' compensation insurance?**
- **Can you provide the names of neighbors who have used your services?**
- **Are you a member of the Better Business Bureau?**

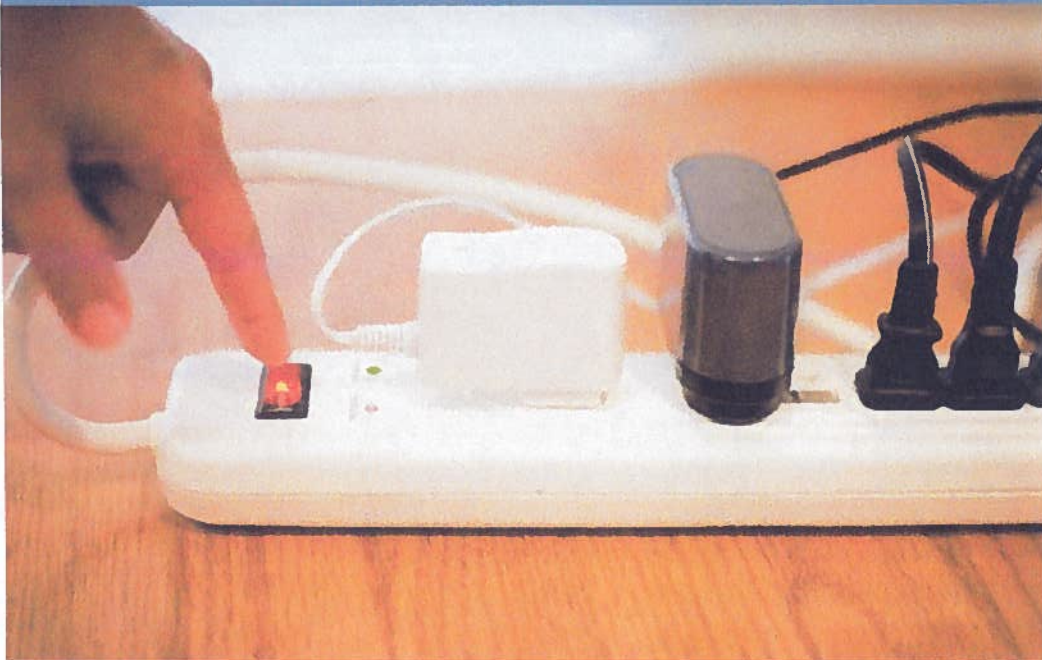


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FOLLOWING SOURCES:

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- U.S. DEPARTMENT OF ENERGY – ENERGY.GOV/YOURHOME.HTM
- ENERGY STAR – ENERGYSTAR.GOV
- ALLIANCE TO SAVE ENERGY – ASE.ORG
- YOUR STATE'S ENERGY OFFICE.





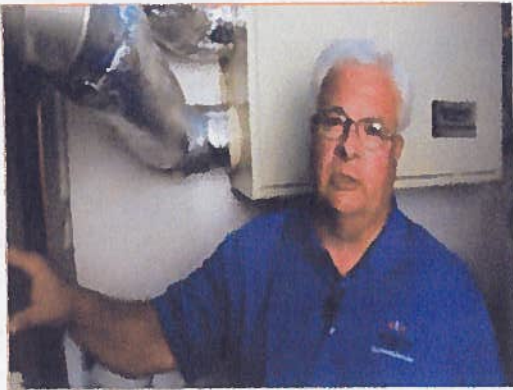
For more information, please contact your local Touchstone Energy cooperative or visit TogetherWeSave.com.

How-To Videos

Seal the Deal

One of the best and easiest ways to save on your energy bill is to make sure your home is properly sealed. Hidden cracks and improper insulation can amount to as much heat loss as having a window open year round.

That's why your local Touchstone Energy Cooperative teamed up with ENERGY STAR® for this simple how-to video, showing you how to seal those small cracks, insulate your home and reduce your energy bill.



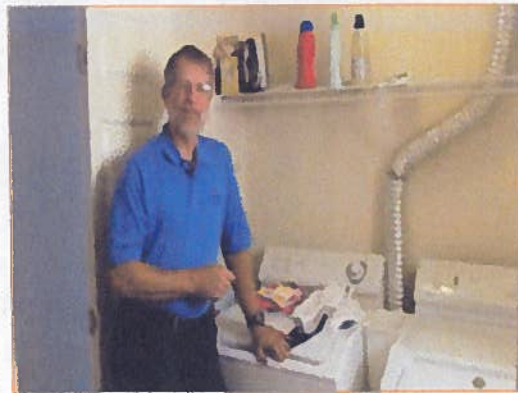
Air Sealing Your Duct Work



Check Your Refrigerator's Seals



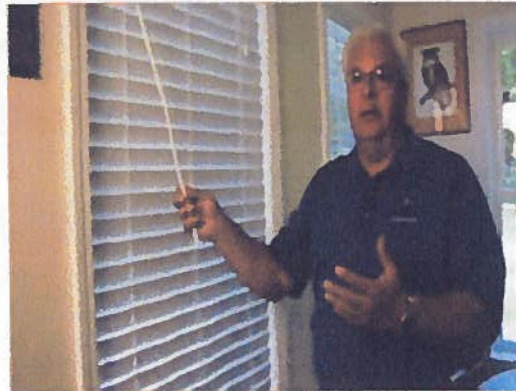
Dishwasher Tips



In the Laundry Room



Saving Energy with Landscaping



Lower the Blinds, Raise the Savings



Setting Your Programmable Thermostat



Stop Air Infiltration

What can you do?

Energy Saving Tips



Unplug it. Learn electronic tips to save energy.



Kid Zone

Fun, Games, Teacher Zone



A cool place where you can learn about electricity, energy savings and electrical safety.

Check It Out

E-News Sign Up

Monthly Energy Saving Tips

* Name

* Email Address

Zip Code

Sign Up Today!

Simple Tips

How can you make your home more energy efficient? With a few simple tips and updates from your local Touchstone Energy Cooperative. After all, they're the Energy Experts.

Follow these steps, from CFLs to ENERGY STAR® appliances, to see the energy savings add up at home. You can also visit the [Energy Efficient Home](#) for room-to-room energy conservation tips or [sign up for energy tips](#) to get the best advice delivered to your inbox every month.

Unplug it.

- **Home electronics**, like computers and TVs, can leak energy even when turned off. Don't forget to unplug all electronics when you go away for the weekend or vacation.
- Plug multiple electronics into a **power strip** to turn them on and off easily.
- Use **outlet covers** to plug unused outlet holes. Not only is it safe, it helps keep warm or cool air from leaking out.
- **Turn off the TV** if no one is watching it. A TV left on while you sleep can cost you \$40-\$100 in extra energy costs per year.

Conserve it.

- Limiting use of **large appliances** like washers, dryers, ovens and dishwashers during peak hours of the day can save money.
- If you cut **dryer** use in half by using drying racks and outdoor lines, you could save \$45 a year.
- **Keeping showers to five minutes** or less will help you save money. A flow restrictor typically costs less than \$1 and can cut the cost of taking a hot shower in half.
- About 90% of the energy used by a **washer** is for water heating. Wash only full loads of clothing in cold water whenever possible.

Insulate it.

- **Weatherstripping** cracks around windows and doors could take as much as 25% off your heating/cooling bill.
- Wrap **windows** in plastic sheeting or opt for double-paneled storm windows.
- If you don't have an energy efficient electric **water heater**, add inexpensive insulation wrap to your gas water heater tank to stop energy leaks.
- Don't forget to **insulate yourself!** Wearing layers in the winter allows you to stay warm without turning your thermostat up.

Close it.

- During hot summer days, keep **drapes and shades** closed so you don't heat up the house. During the winter, close drapes at night to keep heat inside your home.
- Conserve energy by simply using **lids on pots and pans** – your food will cook faster.
- Don't open your **oven** door to take a peek – it lowers the temperature by as much as 25 degrees, increasing cooking time and wasting energy. Another tip? Use ceramic or glass pans and you can turn your temp down 25 degrees without affecting cook times.

- Close the doors to **unused rooms** in your home, along with closing the heat registers to avoid wasting energy.

Replace it.

- **Compact fluorescent bulbs (CFLs)** consume 66% less energy and last up to 10 times longer than incandescent bulbs. You'll see the biggest savings if you replace bulbs in the rooms you use most. Figure out what you could save with our [CFL Calculator](#).
- Change **furnace and air conditioning filters** on a monthly basis. Dirty filters can block the flow of air in and out of your home, increasing energy costs.
- Clean your dryer's **lint trap** after every use – your loads will dry in less time.
- Have a **leaking faucet**? Repair it. One drop of leaking water per second can waste as much as ten gallons in a week.

Control it.

- Turn your **thermostat** and air conditioning down when you're away, or install a programmable thermostat to automatically control the temperature.
- **Ceiling fans** can help your energy bill. By reversing the direction of the fan (counter-clockwise) in the winter, you can push warm air down from the ceiling. In the summer, switch it to run clockwise.
- How often do you leave a room but don't **turn off the lights**, TV or stereo? Leaving the lights on consumes precious energy, and over time the costs add up.
- Keep your **refrigerator** set between 37 and 40 degrees, with your freezer at or slightly above zero.

Invest in it.

- **Landscaping and trees** planted around your home can help shade it from the hot sun and block cold winter winds.
- An **electric heat pump** can help you save as much as 30% on your heating and cooling costs. Plus, unlike traditional heating sources, electric heat pumps offer year-round comfort, keeping you warm in the winter and cool in the summer.
- **ENERGY STAR® appliances** can help you cut back on your energy bill, especially if your current appliances are older and less energy efficient.
- **Solar-powered LED landscape lighting** is an affordable investment that uses zero metered electricity.

Build it.

- If you're constructing a new home, opt for **ENERGY STAR® building materials**. You can find qualified roofing, doors, windows, skylights and appliances to get your home off to an energy efficient start.
- For lighting, install **motion sensors** and **dimnable controls**.
- Using **light-colored roofing and siding** will help your home absorb less heat from the sun and keep it cooler in the summer.
- Maximize natural lighting in your home with **windows and skylights**.

What can you do?

Energy Saving Tips

Unplug it. Learn electronic tips to save energy.



Kid Zone

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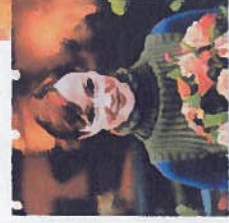
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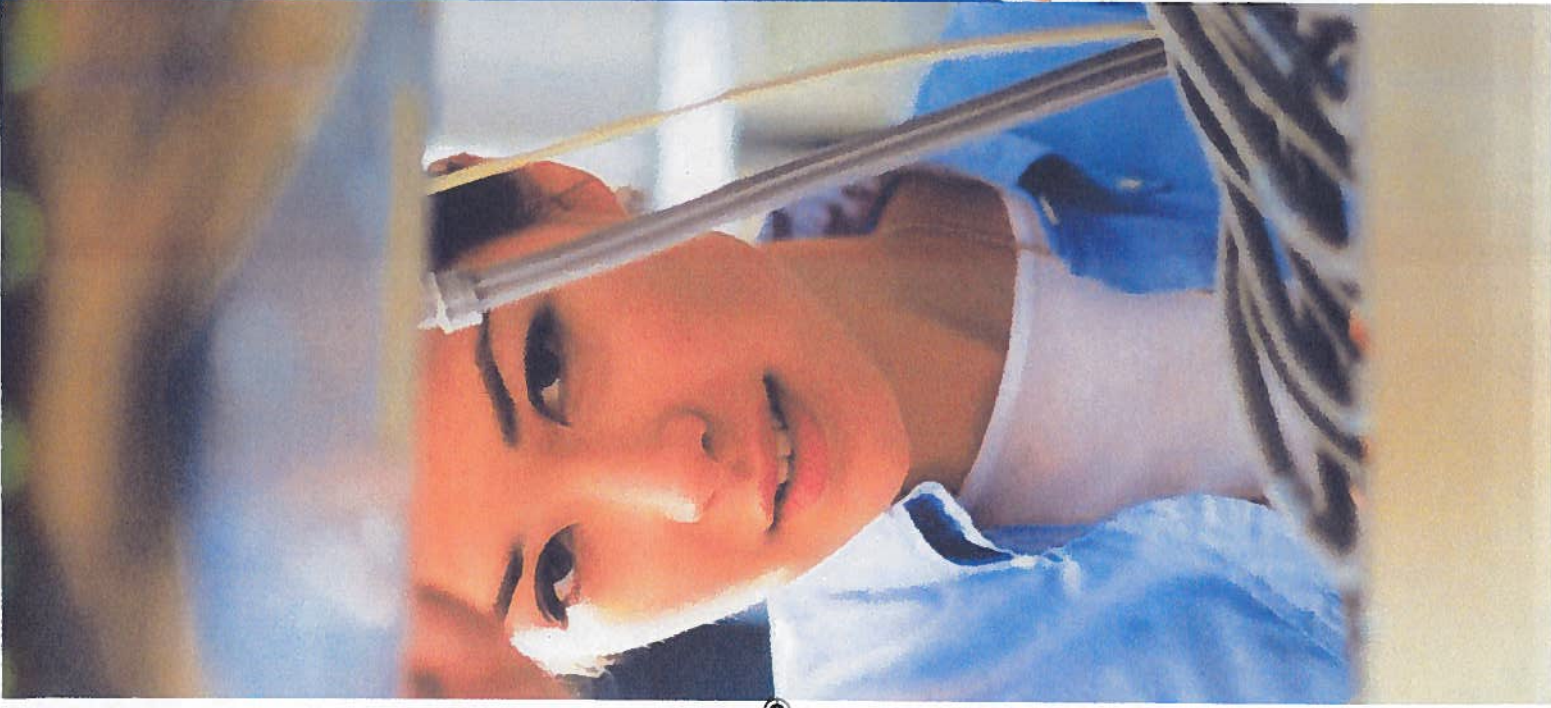
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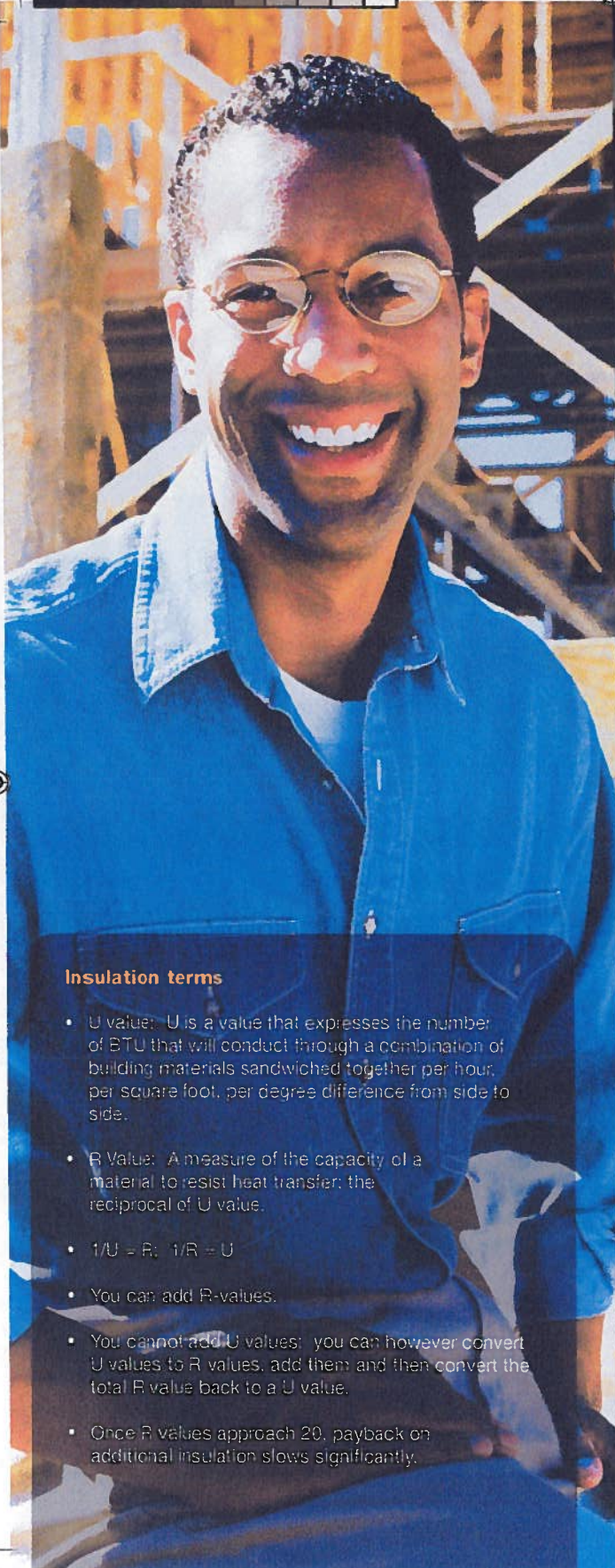
Commercial Energy Savings Guide



Touchstone Energy®
Cooperatives

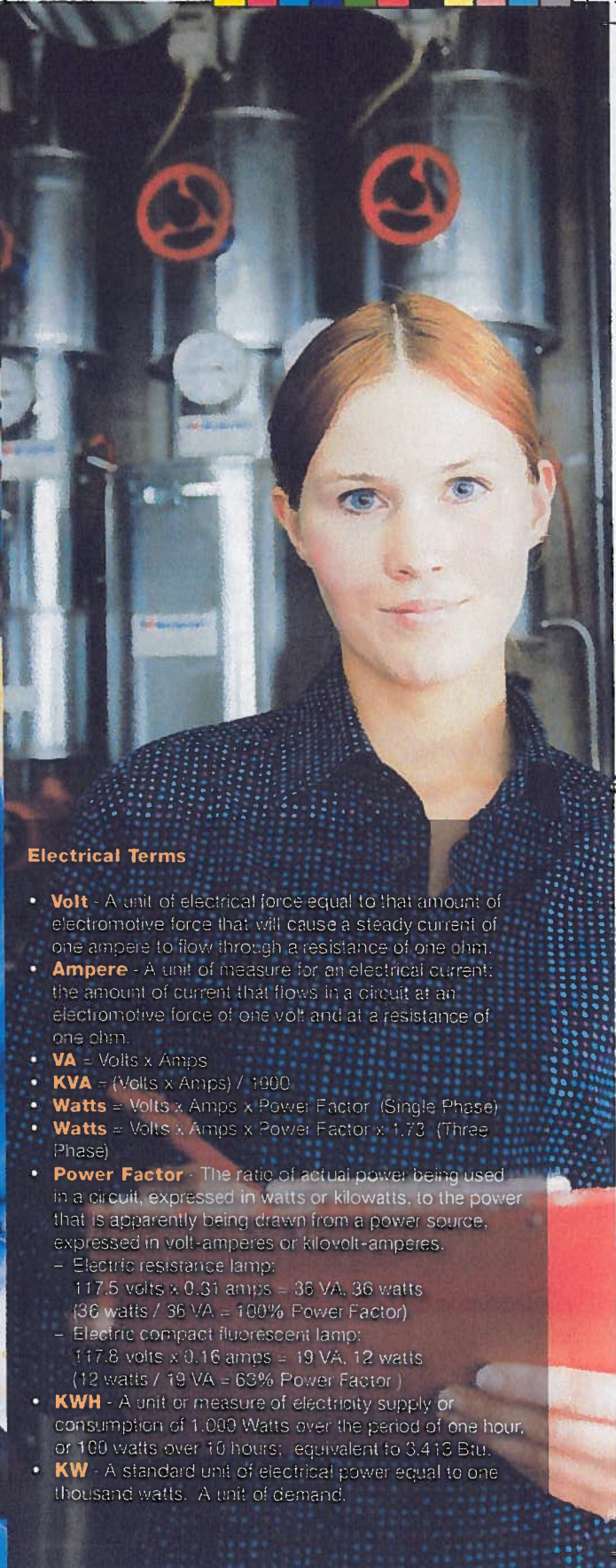
The power of human connections®





Insulation terms

- **U value:** U is a value that expresses the number of BTU that will conduct through a combination of building materials sandwiched together per hour, per square foot, per degree difference from side to side.
- **R Value:** A measure of the capacity of a material to resist heat transfer; the reciprocal of U value.
- $1/U = R$; $1/R = U$
- You can add R-values.
- You cannot add U values; you can however convert U values to R values, add them and then convert the total R value back to a U value.
- Once R values approach 20, payback on additional insulation slows significantly.



Electrical Terms

- **Volt** - A unit of electrical force equal to that amount of electromotive force that will cause a steady current of one ampere to flow through a resistance of one ohm.
- **Ampere** - A unit of measure for an electrical current: the amount of current that flows in a circuit at an electromotive force of one volt and at a resistance of one ohm.
- **VA** = Volts x Amps
- **KVA** = (Volts x Amps) / 1000
- **Watts** = Volts x Amps x Power Factor (Single Phase)
- **Watts** = Volts x Amps x Power Factor x 1.73 (Three Phase)
- **Power Factor** - The ratio of actual power being used in a circuit, expressed in watts or kilowatts, to the power that is apparently being drawn from a power source, expressed in volt-amperes or kilovolt-amperes.
 - Electric resistance lamp:
 $117.5 \text{ volts} \times 0.31 \text{ amps} = 36 \text{ VA}, 36 \text{ watts}$
 $(36 \text{ watts} / 36 \text{ VA} = 100\% \text{ Power Factor})$
 - Electric compact fluorescent lamp:
 $117.8 \text{ volts} \times 0.16 \text{ amps} = 19 \text{ VA}, 12 \text{ watts}$
 $(12 \text{ watts} / 19 \text{ VA} = 63\% \text{ Power Factor})$
- **KWH** - A unit of measure of electricity supply or consumption of 1,000 Watts over the period of one hour, or 100 watts over 10 hours; equivalent to 3,413 Btu.
- **KW** - A standard unit of electrical power equal to one thousand watts. A unit of demand.

Tip 3: Ventilate Properly

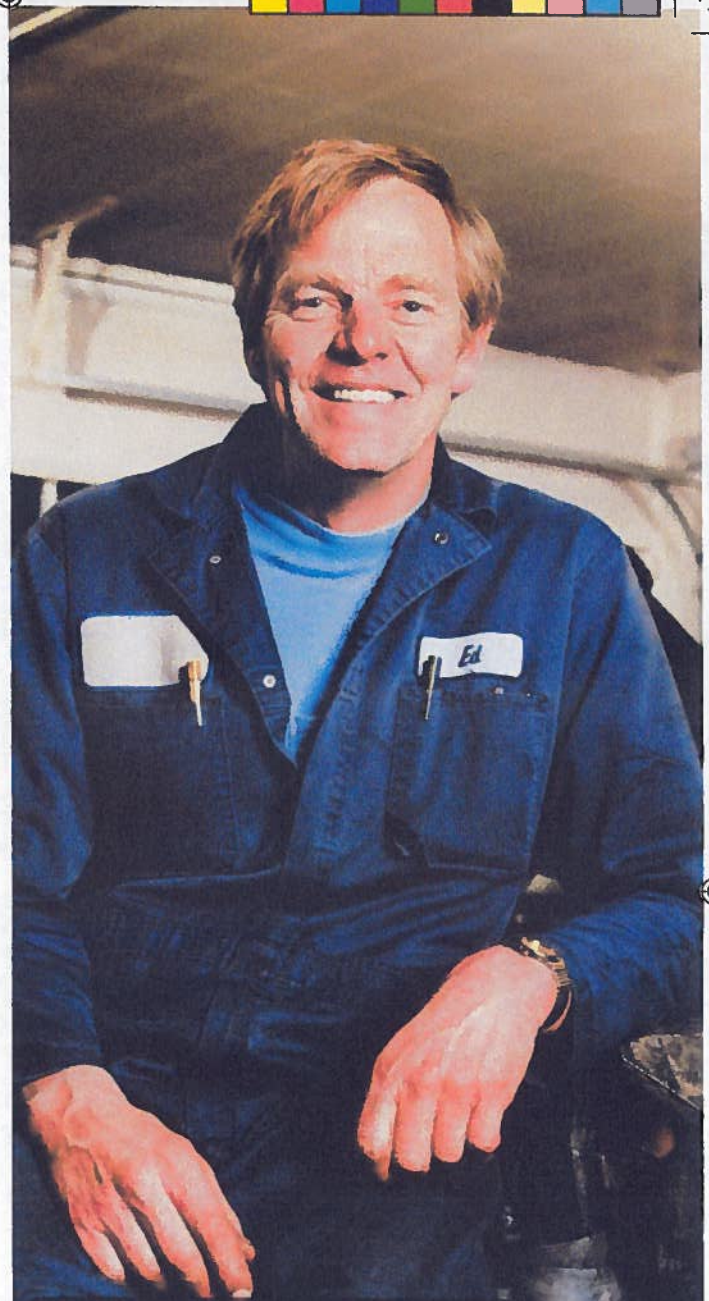
- Meet OSHA standards for occupancy numbers.
- Kitchens should run at a slightly negative pressure.
- Bathroom ventilators should be off when building is closed – if permissible with local codes.
- Ensure make-up air is drawn from an appropriate location. (For example, don't pull from a dumpster area.)
- Ensure that kitchens have adequate air circulation.
- Do not over-ventilate. It is a waste of energy.

Tip 4: Water Heating

- Locate water heaters for most efficient delivery.
- Insulate water heaters.
- Ensure that the heating temperature is correct based on local requirements.
- Control water heaters based on actual periods of need during the day.
- Explore opportunities for heat recovery.
- Be familiar with your state's Board of Health requirements before making any changes that could affect hot water delivery temperatures. For example:
 - There are strict requirements for MINIMUM and MAXIMUM water temperatures for nursing homes.
 - There are strict requirements for MINIMUM water temperatures for manual and automated dishwashing in retail food establishments.

Tip 5: Refrigeration

- Clean refrigeration coils regularly.
- Doors and seals on walk-in units should be kept in good repair.
- Make sure that refrigeration units are properly charged with refrigerant.
- Ensure units are properly defrosting. Check for ice buildup.



Clocking an Electric Meter

This is a useful tool to allow you to check your usage at different times of the day without any specialized equipment.

$$KW = \frac{3.6 \times KH \times \text{Meter Multiplier} \times \text{Revolutions}}{\text{Seconds}}$$

Meter Multiplier is shown on meter or available from utility. Many meters show KH. On electronic meters, count the LED movements across the screen.



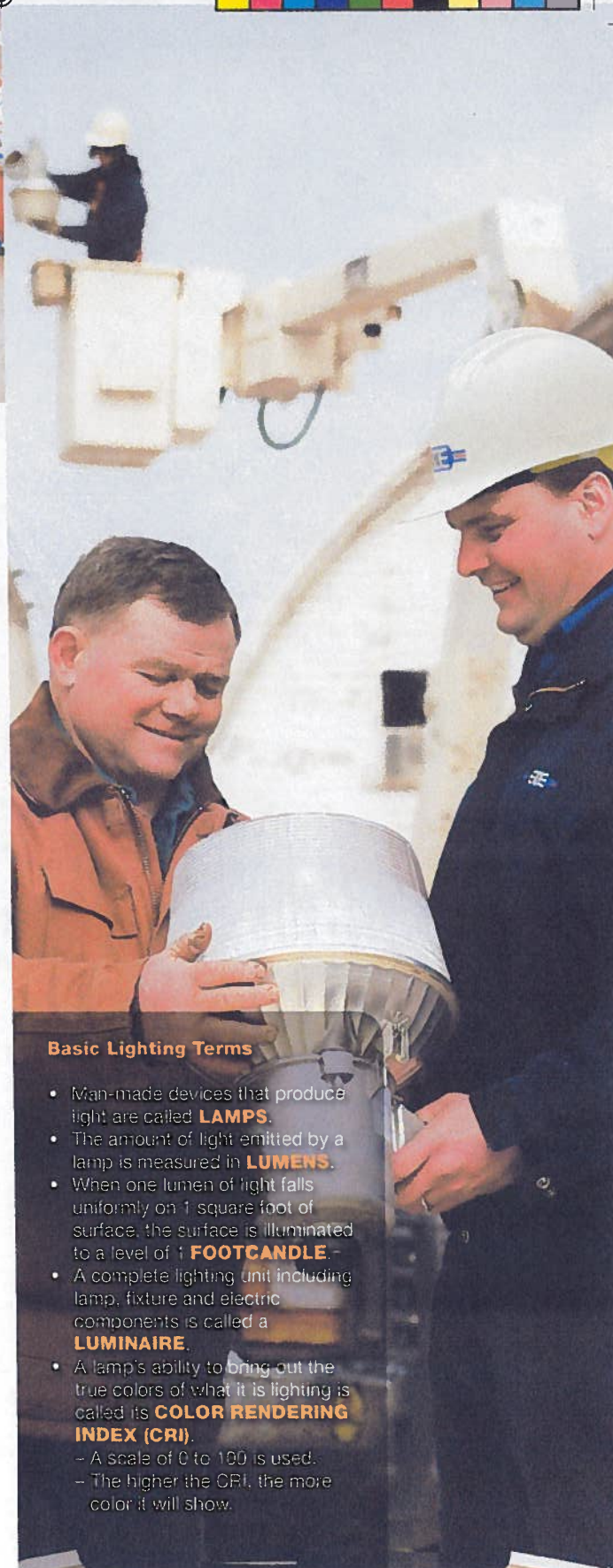
Tip 6: Indoor Lighting

- Depending on your electric rate and hours of operation, switching from magnetically ballasted T-12 fluorescent lamps to electronically ballasted T-8 lamps may save. (T-12 = 1.5" in diameter, T-8 = 1" in diameter)
- Consider switching from incandescent to compact fluorescent in canisters.
- Consider LED exit lighting instead of incandescent.
- Assess lighting levels after closing and explore opportunities to reduce lighting levels in other areas of your business. It may be more than you need.
- Group re-lamping may save on labor costs when compared to spot re-lamping.
- Explore opportunities to switch to high-pressure sodium or metal halide lighting in warehouses.

Tip 7: Outdoor Lighting

- Make sure lighting is adequate for safety.
- Make sure lighting timers are set only for hours needed.
- Consider using sun trackers or photocells in conjunction with electronic timers on outdoor lighting.
- Evaluate converting incandescent or mercury vapor lighting to high-pressure sodium or metal halide lighting.
- Ensure adequate turn-in lighting off of the highway.

The best source of outdoor lighting design, installation and maintenance may be your electric cooperative.



Basic Lighting Terms

- Man-made devices that produce light are called **LAMPS**.
- The amount of light emitted by a lamp is measured in **LUMENS**.
- When one lumen of light falls uniformly on 1 square foot of surface, the surface is illuminated to a level of 1 **FOOTCANDLE**.
- A complete lighting unit including lamp, fixture and electric components is called a **LUMINAIRE**.
- A lamp's ability to bring out the true colors of what it is lighting is called its **COLOR RENDERING INDEX (CRI)**.
 - A scale of 0 to 100 is used.
 - The higher the CRI, the more color it will show.

Tip 8: Motors
(operating hours over 2,000/year)

- Manage motors with long run times to save energy cost.
- Replace motors under 25 hp with energy efficient motors vs. rewinding them.
- Depending on the run time, buying a new energy efficient motor can pay for itself in energy savings and may last longer than the rewind motor.
- Size loads properly for the job. Oversized motors will use more energy than properly sized motors.



Tip 9: Due Diligence is Essential

All that glitters is not gold, and everything a salesperson tells you will not necessarily save you money. Asking a few good questions can save you the grief of causing more problems than you cure with new technologies.

Questions to ask a product vendor or supplier:

- Is it UL approved?
- Do you have a letter from the manufacturer stating no equipment warranties will be voided?
- Do you have reports from credible sources (ASHRAE, IES, DOE, Lawrence Berkeley National Labs) supporting the product's effectiveness?
- Can you provide the names of 10 companies, with contacts and phone numbers, who have used your product for a year or more and who will attest to its effectiveness?
- How long has your company been selling this product?



Fuel Unit BTU Values

- Electric **KWH = 3,413 BTU**
- Natural Gas **THERM = 100,000 BTU**
- Natural Gas **CCF = 103,000 BTU**
- Propane **GALLON = 91,600 BTU**
- #2 Fuel Oil **GALLON = 140,000 BTU**
- **MMBTU = 1,000,000 BTU**
- **One ton of refrigeration = 12,000 BTUs**

Comparing cost effectiveness of different fuels

$$\text{Cost per delivered} = \frac{1000 \times \text{Fuel Unit Cost}}{\text{MMBTU} \times \text{Fuel Unit BTU value} \times \text{COP}}$$

Fuel Unit Cost = Cost in \$ per KWh, MMBTU, gallon of diesel etc.

Fuel Unit BTU value – see above

COP = Coefficient of Performance

COPs for Different Systems:

- Heat Pump – Use published COP
- Strip Heat – Use COP of 1
- Fossil Fueled Furnace or Fossil Fired Boiler – Use published Steady-state Efficiency

Exhibit 7



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Hydroelectric Power

Solar Power

Tips to help control energy consumption and costs.

Our commitment to providing environmentally sound power resources.

Renewable Resources

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Hydropower: A Cooperative Cornerstone

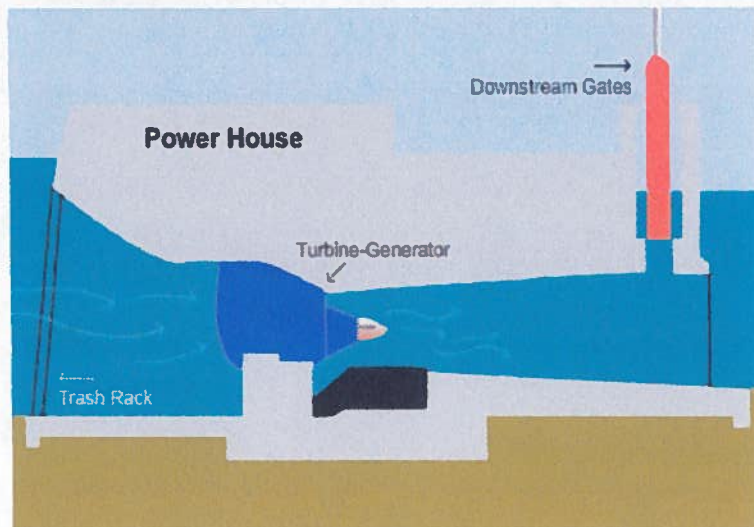
[Real-Time Hydroelectric Power Generation](#)
Click Here

The Electric Cooperatives of Arkansas completed the first of three hydropower plants on the Arkansas River in one of their most ambitious generation projects ever in December of 1988.

The plant, the Clyde T. Ellis Hydroelectric Generating Station, was built at the James W. Trimble Lock and Dam near Fort Smith. It marked the cooperatives' commitment to a long-term, low-cost power source for their members, as well as their dedication to environmentally friendly power, long before it was fashionable to do so. Later in the 1980s and 90s, the cooperatives completed two other hydropower plants, making the total investment in renewable energy resources at about \$330 million.

Although AECC didn't begin building hydropower plants until the 1980s, the cooperatives had long been familiar with the benefits of hydropower. From their very inception, they depended on hydropower from federal dams to serve their members. In fact, without hydropower, it could be argued that the cooperatives might not have been able to survive.

Hydroelectric Generating Station



Hydropower History

Two years before President Franklin D. Roosevelt's signing in 1935 of the Rural Electrification Act, which created the Rural Electrification Administration (REA) and provided funding for the development of cooperatives across the country, he signed the Tennessee Valley Authority Act of 1933. This law laid the first cornerstone for the formation of the electric cooperatives by providing a vital building block for the program - access to hydropower from the federal government's dams.

Publicly owned utilities first got access to the power in 1902 with the passage of the Reclamation Act, which was designed to spur growth in the West by reclaiming the arid region through the construction of dams to divert and store the available water. With the 1933 law, cooperatives were added to the "preference" list, and Arkansas' electric cooperatives have benefited ever since. In the 1950s, when

many of the dams were being built in Arkansas and surrounding states, the power they produced was not the least expensive electricity being produced. But the cooperatives didn't have many alternatives, so they took it. Today, hydropower is the lowest cost power resource, especially during periods of peak electricity demand.

AECC continues to buy federal hydropower from the Southwestern Power Administration (SPA), a Tulsa, Oklahoma-based government agency that markets power from 24 federal dams. Under contract with the SPA, AECC is entitled to 189 megawatts of power annually. Because the power from SPA is available for a limited number of hours during the year, AECC uses most of it during its peak demand for power.

AECC Eyes the Arkansas River

While the U.S. Army Corps of Engineers constructed major dams on the Arkansas River through the McClellan-Kerr Arkansas River Navigation Project, hydropower wasn't a top priority and several were built without powerhouses. At a 1999 ceremony commemorating the completion of AECC's third hydropower plant on the Arkansas River, Dale Bumpers told attendees that when he joined the Senate in 1975, he wanted to build hydropower plants on every dam on the Arkansas River. But he said he quickly discovered that there was no support from the federal government to build new hydropower plants, and the private sector was also disinterested. That's because the investment wouldn't provide a quick payback, but would for the long term. Bumpers added that he was elated when AECC applied in 1978 for federal licenses to build the plants.

The Corps did build powerhouses at five Arkansas River dams that had the greatest potential for hydropower generation. But, because energy was cheap at the time, the government decided it wasn't worth the investment to put hydropower plants at the other locks and dams.

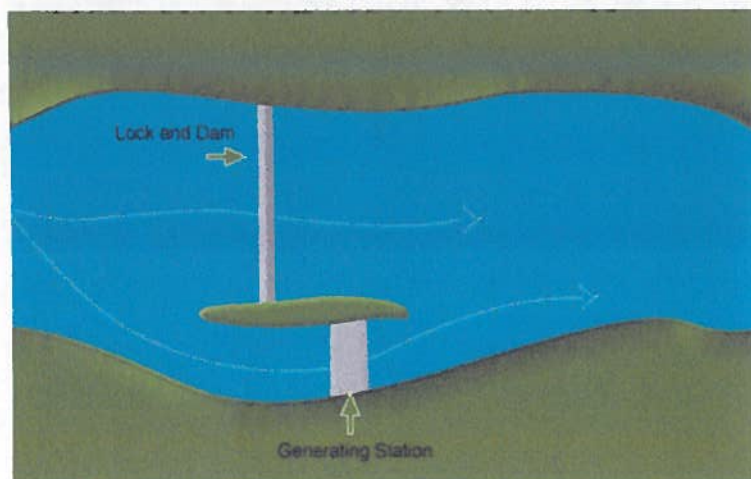
However, in the late 1970s, power costs were again on the rise and AECC began looking for ways to lower those costs. That's when the cooperatives turned to the Arkansas River. It was not a decision that was made easily. Before construction began, AECC conducted feasibility studies and went through a lengthy process to obtain the federal licenses for the hydropower plants. The first plant, the Clyde T. Ellis Hydroelectric Generating Station, began operation in 1988 with an installed capacity of 32.4 megawatts and cost about \$75 million to build.

Five years later, the Carl S. Whillock Hydroelectric Generating Station at the Arthur V. Ormond Lock and Dam near Morrilton was completed at a cost of \$80 million. Its installed generating capacity is 32.4 megawatts.

The cooperatives began work on their third hydropower plant in 1994. This plant, located at the Wilbur D. Mills Dam near Dumas, was completed in 1999 at a cost of about \$189 million. In 1999, cooperative leaders and dignitaries celebrated the construction of the plant, known as the Electric Cooperatives of Arkansas Hydropower Generating Station. It has an installed generating capacity of 102.6 megawatts.

Run of the River

AECC's hydropower plants are low-head, run-of-river plants. Run-of-the-river plants use the available water flowing downriver to generate electricity without ponding water or changing the rate of flow from what the Corps of Engineers would normally release. They are low-head plants, meaning that they operate at dams where the "head," which is the difference between water levels on the upstream and downstream sides of the dam, is typically around 20 feet or less. The power plants at the dams on the White River, for example, are high-head plants with heads measuring 100 feet or more.



Environmentally Friendly Power

In addition to providing low-cost power, AECC's plants provide environmentally friendly "green" power.

There are no emissions, no solid wastes produced, no radioactive emissions and no dangerous chemicals used in the generation process. When hydro plants run, AECC displaces the burning of fossil fuels at coal- and oil-fired plants and, in the process, reduces emissions from those units.

According to estimates based on historical rivers' flows, AECC's three hydroelectric plants eliminate the need to burn 391,000 tons of coal or 1 million barrels of oil each year.

For the Long Run

With 20 years under its belt, the Ellis plant is going strong, as are the others. [Click here](#) for the total megawatt-hours produced by AECC's hydroelectric plants to date. The plants have estimated lifespans of 100 years, which means the cooperatives have a long-term resource that will only increase in value as fuel costs for other sources of generation, such as natural gas-fired power, continue to climb. Hydroelectric is low-cost power using a renewable resource and will benefit Arkansas' electric cooperatives for generations to come.



The March edition is printed. Here is a link to the electronic version
for you to enjoy. <http://www.aecc.com>

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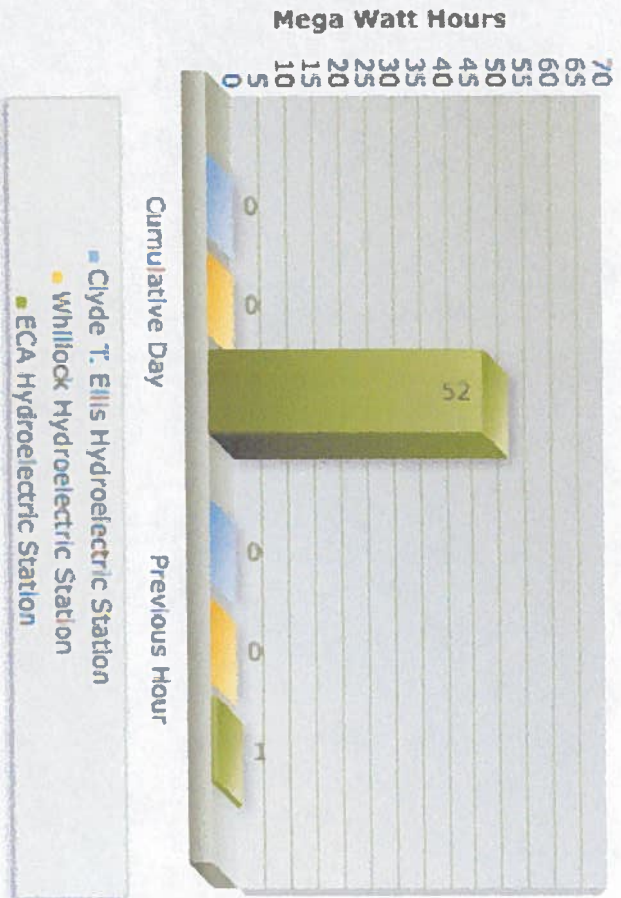
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1 Cooperative Way, Little Rock, AR 72209
Ph: 501-570-2200
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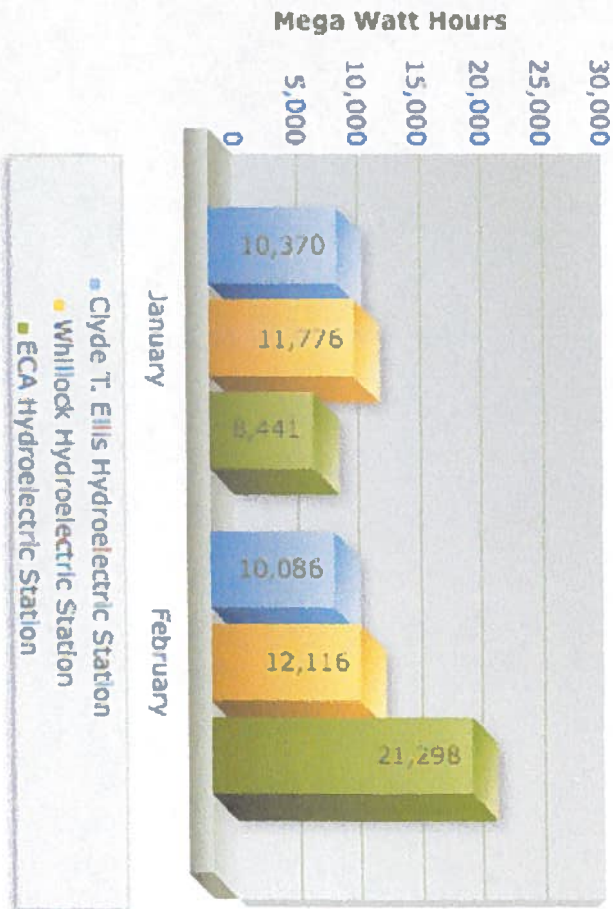


Hydroelectric Power

Daily Generation-February 28, 2012



Monthly Generation



Lifetime Generation (MWH)

Clyde T. Ellis Hydroelectric Station: 2,475,299 MWH Since 1988
Whilllock Hydroelectric Station: 2,025,867 MWH Since 1993
Electric Cooperatives of Arkansas Hydroelectric Station: 3,651,819 MWH Since 1999
TOTAL: 8,152,985 MWH

Exhibit 8



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Tips to help control energy consumption and costs.

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[Click Here](#)



AECI's Utility Sales Tests Solar Power

The Arkansas Electric Cooperatives, Inc. (AECI) Utility Sales Department won't be going off the grid anytime soon, but they are testing another source of power - solar energy.

In early 2009, the department purchased solar panels as part of a pilot program to test small-scale solar power systems to determine if AECI might add them to their product offerings.

Preformed Line Products installed the system which has 33 panels and cost about \$47,000. In addition to the panels, the system has an inverter that converts the DC power produced by the panels to AC power that is used in the building. The system has a generation capacity of 7,000 watts.

AECI Solar Power System Installation

Click and drag corner of page to turn



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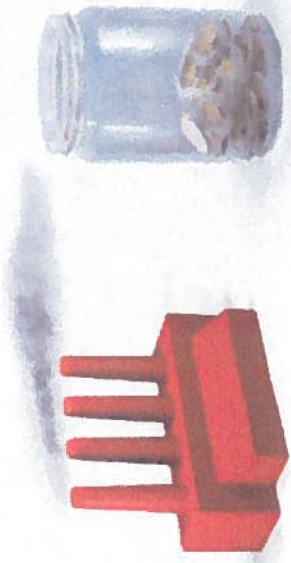
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 - Rural Teacher of the Year
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- Energy Efficiency
 - Doug Rye
 - Energy Efficiency Makeover
 - GE Hybrid Water Heater
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USSDSolar Plant overview

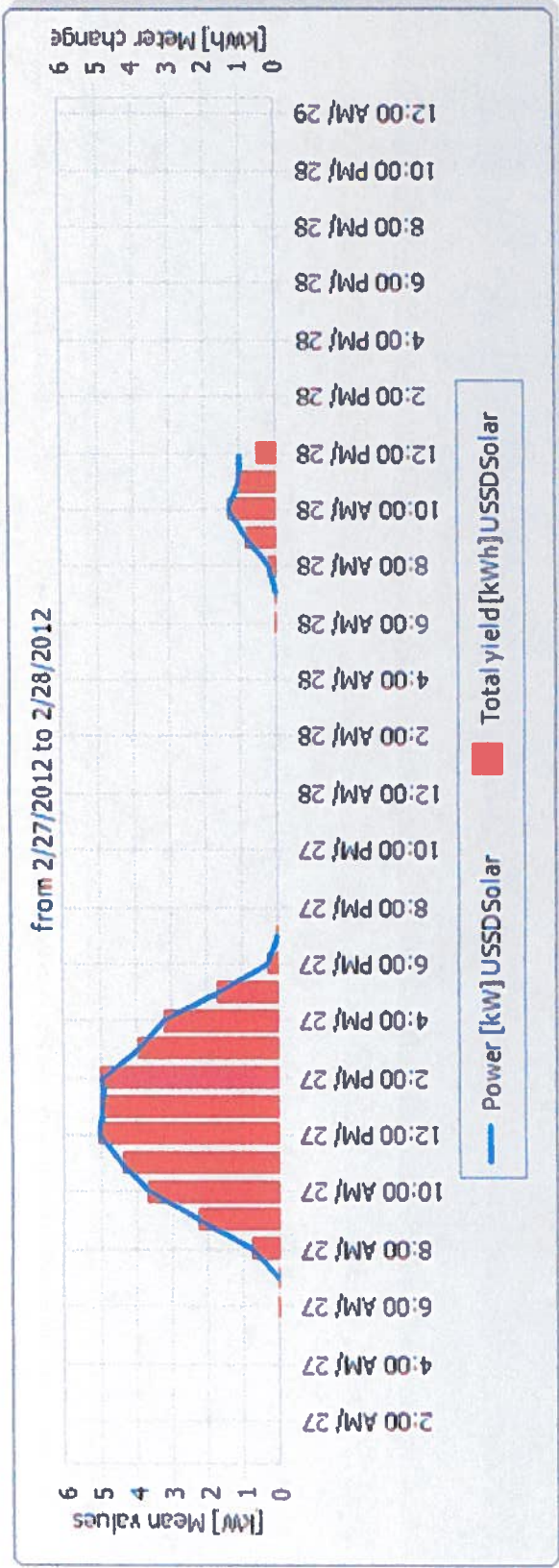
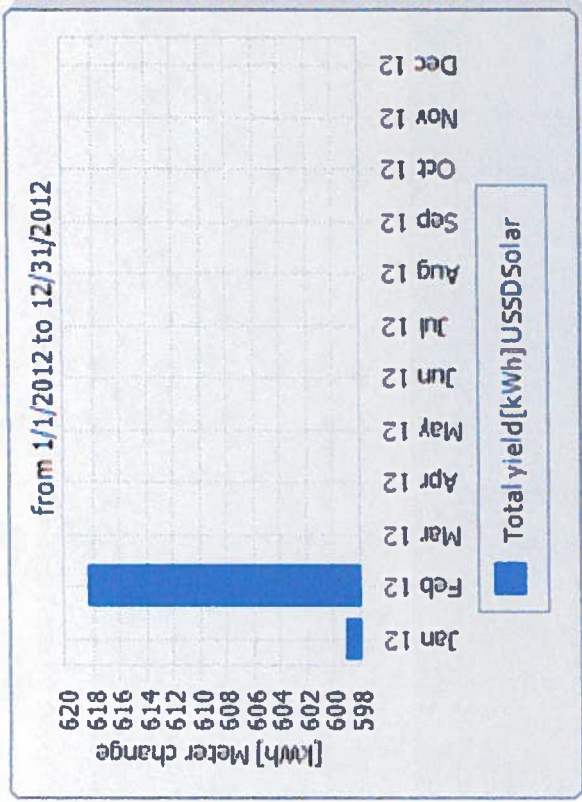
Date:
2/28/2012

Energy:
29,912.49 kWh



CO2 avoided:
20,938.74 kg

Reimbursement:
13,984.09



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Exhibit 9

Smart Energy Tips



Save Energy.
Save Money.
Live Comfortably.



**Electric Cooperatives
of Arkansas**

Your Local Energy Partners

www.SmartEnergyTips.org



It doesn't take expert deductive reasoning to realize that with just a few changes any home can become more energy efficient. These energy saving measures can help you save energy and live comfortably.

Sherlock
HOMES
Private Energy Investigator

Lighting

Replace traditional incandescent light bulbs with energy-efficient compact fluorescent lights which are up to four times more energy efficient and last nine times longer than incandescent bulbs. You could save up to \$57 in electricity costs over the life of each bulb.

Turn off lights in rooms you aren't using, or install timers or occupancy sensors to reduce light consumption.



Heating and Cooling

Service accordingly. Have heating and cooling systems tuned up in the fall and spring. Make sure ductwork is intact and sealed properly.



Clean or replace filters on air conditioners and heat pumps regularly. Use an air conditioner with a seasonal energy efficiency ratio (SEER) of 13 or higher. Use the proper size for your home. If building a new home, consider installing an energy-efficient geothermal system to cool and heat the home. Contact a reputable HVAC contractor to properly size the unit required for your home.

Insulate. Make sure insulation levels are appropriate in the attic, exterior and basement walls, ceilings, floors and crawl spaces. You can increase the comfort of your home and reduce annual heating and cooling usage up to 30 percent just by investing in proper insulation—cellulose is recommended—and sealing unwanted air infiltration.

Ceiling fans can bring energy-saving benefits to the home. Most ceiling fans use only about as much power as a 100-watt light bulb. When used properly, ceiling fans can save money on utility bills year-round.

Appliances and Electronics

Replace aging, inefficient appliances and electronics with Energy Star appliances. Look for the Energy Star label to select energy-efficient models. Energy Star models use much less power than their counterparts.

Wash full loads of laundry using cold water when possible. Don't over-dry clothes, and clean the dryer's lint filter after every load to maximize air circulation.

Use the energy-saving settings on refrigerators, dishwashers, washing machines and clothes dryers. Air-dry dishes by opening the dishwasher instead of using the heated drying cycle.

Keep your refrigerator or freezer at recommended temperatures of 37°F to 40°F for the refrigerator and 5°F for the freezer. Have the coils cleaned at least twice per year.

Cook smarter! Match the size of the pan to the heating element. Use electric pans, toaster ovens or microwaves for small meals. You will use less energy and reduce cooking time.

Turn off the television when no one is watching. Today's state-of-the-art, high definition sets offer amazing viewing, but also use more electricity than older televisions. Use power strip cords and turn off when not in use.

Shut down the computer. Conserve energy by turning off or using sleep mode for computers not in use for two hours or more. Use power strip cords and turn off when not in use.



Water Heater

Set the temperature on water heaters to 120°F, and install an insulating blanket on the water heater (which should pay for itself in less than a year). Consider replacing old units with a high-efficiency water heater with an energy factor of .90 or higher.

Take a shower. In most households, it uses far less hot water than bathing.



Save Energy.
Save Money.
Live Comfortably.





Windows and Doors

Unwanted air infiltration makes your home uncomfortable and increases utility bills.

Caulk and seal cracks and holes that allow outside air to infiltrate into your home, or conditioned air to escape from it. Look for signs of air infiltration around walls, ceilings, doors, windows, recessed ceiling lights, plumbing penetrations, and electrical switches and outlets. Use non-expanding foam insulation around doors and windows.

Inspect single-pane and old windows. Boost their efficiency with weather-stripping or replace with energy-efficient models. Select new windows with a U-factor of .30 or lower and with low-emissivity (low-E) coatings. Window coatings save energy, especially on west-facing windows. For most residential applications, low-E coatings are sufficient. They can cut heat gain by up to 25 percent without changing a window's appearance. Consult with an energy auditor before replacing windows.

Outdoors

Landscape smart. A line of fast-growing trees, like poplars, or tall shrubs can serve as a windbreak. Planting evergreen trees on the north side and deciduous trees on the south side of a home can block winter winds and summer sun. Shrubs along the house can help, too, but don't let them interfere with heat pumps or air conditioners.

Humidity is a factor. To avoid raising the humidity indoors during summer months, take baths or showers and wash dishes early in the morning or in the evening instead of during the day, and use an outside clothesline rather than a dryer. Replace old or worn out bathroom exhaust fans with humidity-sensing units.



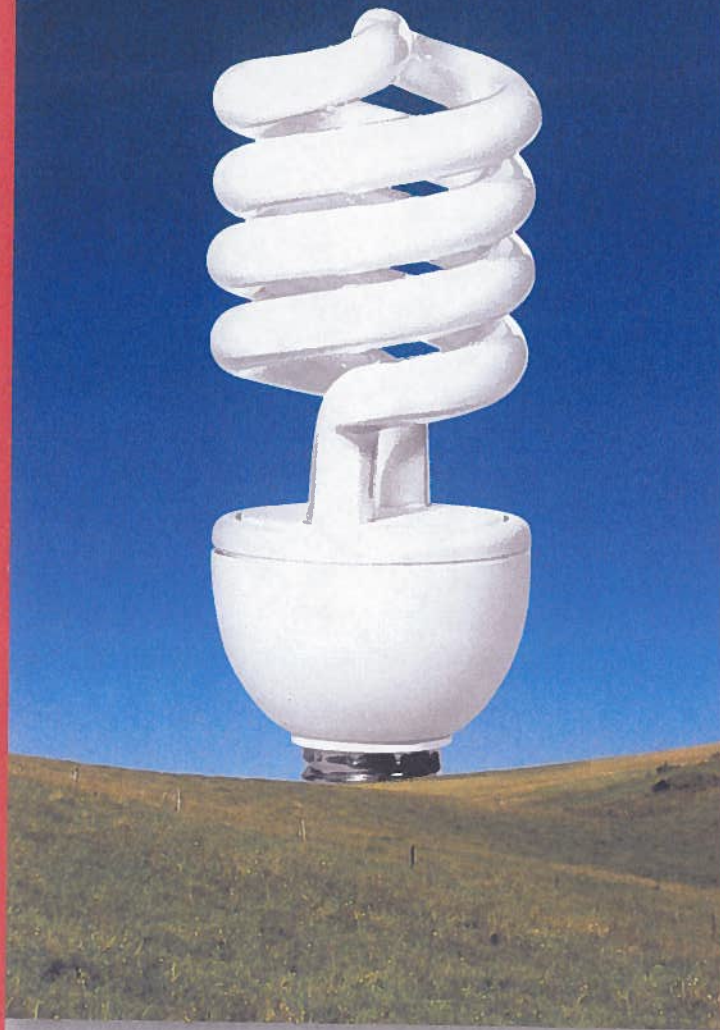
**Electric Cooperatives
of Arkansas**

Your Local Energy Partners

www.SmartEnergyTips.org

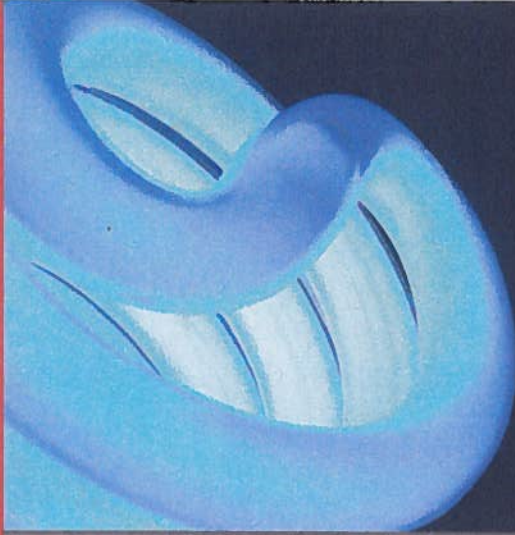
COMPACT FLUORESCENT LAMPS

**SAVE ENERGY | SAVE MONEY
LIVE COMFORTABLY**



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of Arkansas**

Your Local Energy Partners
www.ecark.org



What is a CFL?

A compact fluorescent lamp, or CFL, is designed to fit in a standard residential socket replacing an incandescent bulb. While they cost a bit more than a standard bulb, real savings are realized over the life of the CFL, which will last up to 10 times longer and use 75 percent less energy.

In the case of a CFL, the word 'fluorescent' is deceiving. CFLs are designed to emit a soft, clear white light, much like that from the familiar incandescent bulb.

But that's where the similarities end. You see, if every Electric Cooperative of Arkansas member replaced just one standard bulb with a CFL, we could:

- *Save enough energy to power 13,000 average homes for one year*
- *Save more than \$14 million in energy costs*
- *Save 51,000 tons of coal*
- *Eliminate emissions equivalent to 13,874 cars on the road*

As if those reasons weren't enough, CFLs last ten times as long as a standard incandescent bulb — up to ten years! Just imagine your own savings if you took it upon yourself to change all your home's bulbs!

For more information, contact the Electric Cooperatives of Arkansas at 1-800-482-1277 or visit www.ecark.org.

**We all share a responsibility
for energy efficiency wherever
and whenever we can.**

*What better way to begin than simply
replacing the light bulbs in your own home?*

*Using compact fluorescent lamps is one small
change we can all make to save electricity
and save money at the same time.*

How to Choose and Where to Use CFLs

Energy Star qualified CFLs provide the greatest savings in fixtures that are on for a substantial amount of time each day. At minimum, Energy Star recommends installing qualified CFLs in fixtures that are used at least 15 minutes at a time or several hours per day. The best fixtures to use qualified CFLs in are usually found in the following areas of your home:

- *family and living rooms*
- *kitchen*
- *dining room*
- *bedrooms*

***Who would have thought energy efficiency
could be as easy as changing a light bulb?***

Yes, together we can make a difference.





**By replacing just one
incandescent bulb with an
energy-saving CFL, you will:**

- *Use 75 percent less energy for
the same amount of light from
an incandescent bulb*
- *Save more than \$58 over the life
of the bulb*
- *Save time, since CFLs last up to
10 times longer*
- *Enjoy warm, high quality light*



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www.ecark.org

1 Cooperative Way
P.O. Box 194208
Little Rock, AR 72219-4208
501.570.2200

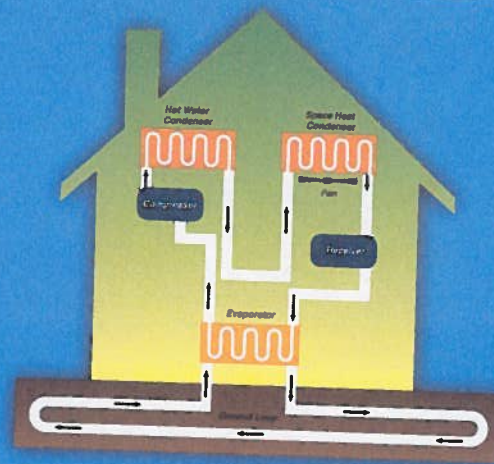
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GEOHERMAL HEAT PUMPS
SAVE ENERGY | SAVE MONEY
LIVE COMFORTABLY



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Enjoy Natural Comfort

Replace your heating and air conditioning unit with one that's recommended by Mother Nature. The all-new geothermal heat pump uses the constant temperature of the earth to keep your home toasty during the winter and cool in the summer. On top of that, it can give you free hot water during the warm summer months.

How Does it Work?

Geothermal/ground source heat pumps are electrically powered systems that take advantage of the earth's 58-degree ground temperature to provide heating, cooling, and hot water for homes and commercial buildings.

Money-Saving Investment

Geothermal/ground source heat pumps can cut your home or business heating and cooling costs by up to 50 percent and provide hot water free or at substantial savings.

Durability

Geothermal/ground source heat pumps last longer than conventional systems because they are protected from harsh outdoor weather. The unit is housed indoors and the loop is underground.

Instant Comfort

In the winter, a geothermal system moves warm air throughout your home or business, creating an even comfort level. This helps to even out hot or cold spots and eliminates the cold air blasts common with fossil fuel furnaces.

For more information, contact the Electric Cooperatives of Arkansas at 1-800-482-1277 or visit www.ecark.org.

The Geothermal System

Geothermal systems use the earth to heat and cool your home or business. That energy also provides free hot water during summer. When it comes to being green and renewable, geothermal systems can't be beat.

Low Maintenance

Geothermal/ground source heat pumps have fewer mechanical components, making them more reliable and less prone to failure. The ground loop has an expected life of more than 50 years and requires no maintenance.

Something for Free

During the summer, when the system is in a cooling mode, your hot water is produced free as a by-product of the thermal process. In winter, the system uses the heating mode to heat a portion of your hot water.

Environmental Benefits

Geothermal systems conserve energy. The systems move heat that already exists rather than using an energy source to create heat. Geothermal systems also reduce the amount of toxic emissions in the atmosphere. Geothermal systems do not rely on outside air, so the units keep the air inside of buildings cleaner and free from pollens, outdoor pollutants, mold spores and other allergens.

A Cost Comparison Of Home Heating And Cooling: Annual Operating Costs *

SYSTEM	1,500 Sq. Ft. Home	2,500 Sq. Ft. Home
Geothermal Heat Pump	\$386	\$644
LP Furnace and A/C	\$1,220	\$2,014
Gas Furnace and A/C	\$1,356	\$2,241
Air-Source Heat Pump	\$705	\$1,133

* Energy use data based on calculations reflecting a home of average construction and insulation R-values. Geothermal heat pump SEER 19 COP 4.5, air source heat pump SEER 13 HSPF 8, LP (propane) and natural gas AFUE 80%, Standard A/C SEER 10. Utility rates based on \$0.066 per kWh, \$1.85 per therm natural gas, \$1.25 per gallon propane.



Install a Geothermal Heat Pump and:

- *Get free hot water during the summer*
- *Save up to 50 percent of heating costs*
- *Save up to 75 percent of cooling costs*
- *Have minimal maintenance costs*



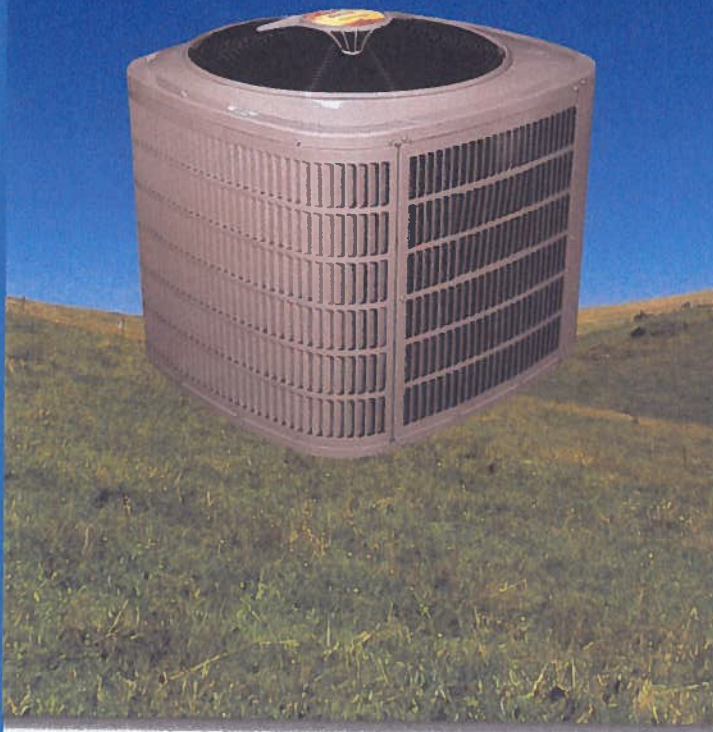
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AIR SOURCE HEAT PUMPS
SAVE ENERGY | SAVE MONEY
LIVE COMFORTABLY



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How Does it Work?

The technology in an air source heat pump is similar to what you would find in your kitchen refrigerator. Using a simple refrigeration cycle, refrigerators remove heat from your food and drinks and reject it into the kitchen. This process of moving heat is achieved by taking advantage of the energy stored and released when a refrigerant changes from a liquid to a gas.

Simply put, a heat pump can move heat into or out of your home. In the summer, it acts like a standard air conditioner and moves heat from the inside outdoors. It does exactly the opposite in the winter, capturing heat from the outdoors and moves it into your home, keeping you and your family warm.

There are two basic kinds of air source heat pumps. Your home's layout will determine which will work best for you.

Packaged Heat Pumps

The packaged heat pump is a self-contained unit that allows the compressor and both heat exchangers to be located outside your home. The unit uses ductwork to heat and cool your entire home. There are several types of packaged heat pumps which may be used for single rooms and don't require ductwork.

Air Source Heat Pump

There are a number of reasons to consider an air source heat pump to heat and cool your home, not the least of which is energy efficiency. New models not only save resources, but they are also well-designed to provide comfort no matter the season.

Split-System Heat Pumps

The second more common type, called the split system heat pump, allows you more options for installation location. The indoor air-handling unit and heat exchanger are separate from the compressor and the outdoor exchanger. Whole-house heating and cooling occurs via ductwork.

Benefits of Air Source Heat Pumps

- May be used for cooling and heating.
- Reduces utility bills up to 50 percent.
- Reduces emissions.
- Very low maintenance.
- No flammable fuel is used at the point of heating, reducing potential danger to users and eliminating the need for gas or fuel.

For more information, contact the Electric Cooperatives of Arkansas at 1-800-482-1277 or visit www.ecark.org.

A Cost Comparison Of Home Heating And Cooling: Annual Operating Costs*

SYSTEM	1,500 Sq. Ft. Home	2,500 Sq. Ft. Home
Air-Source Heat Pump	\$705	\$1,133
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Geothermal Heat Pump	\$386	\$644

*Energy use data based on calculations reflecting a home of average construction and insulation R-values. Geothermal heat pump SEER 19 COP 4.5, air source heat pump SEER 13 HSPF 5, LP (propane) and natural gas AFUE 80%, Standard A/C SEER 10. Utility rates based on \$0.066 per kWh, \$1.85 per therm natural gas, \$1.25 per gallon propane.

Tips for Maximizing Heat Pump Efficiency

- Make your home as energy-efficient as possible (with proper insulation, energy efficient windows, etc.) to allow for a smaller heat pump system with shorter duct lengths.
- Installing ducts inside your home's insulation and air barrier is a major energy saver.
- Insulate your ducts to R-8 if they must be located in an attic or crawl space.
- Locate the outdoor unit on the north side of your home if possible or in the shade.
- Specify that the measured air leakage through your new ducts be less than 10 percent of your system's airflow.
- Tell your contractor that you want a return register in every room.
- Make sure ductwork is sealed well. Clean or replace filters regularly.
- Clean outdoor coils often.
- Remove plant life and debris from around the outdoor unit.
- Clean evaporator coil and condensate pan every two to four years.
- Clean the blower's fan blades.
- Clean supply and return registers and straighten their fins.
- Schedule professional service annually.

The heating efficiency of an air source heat pump is measured as the Heating Seasonal Performance Factor (HSPF), and typically ranges from 7.7 to 8.1. Cooling efficiency for these heat pumps is indicated by the Seasonal Energy Efficiency Ratio (SEER), which typically falls between 13.0 and 19.0. The higher the number, the better the system. Always look for the Energy Star® label!



Electric Cooperatives of Arkansas

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Little Rock, AR 72219 4208
501.570.2200

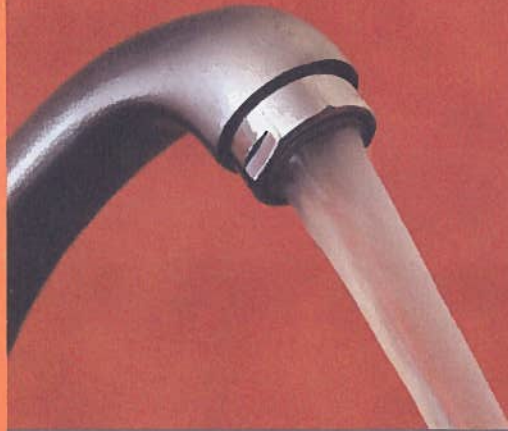
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MARATHON WATER HEATERS
SAVE ENERGY | SAVE MONEY
LIVE COMFORTABLY



**Electric Cooperatives
of Arkansas**

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www.ecark.org



A Lifetime Commitment

When the Marathon water heater was developed more than 15 years ago, engineers had three goals in mind:

- A true lifetime warranty
- Energy efficient
- Installation friendly
(lightweight and easy to connect)

Lifetime Warranty

A true lifetime warranty is a promise that your Marathon water heater will last the life of your home. It could quite possibly be the last water heater you will ever buy. Based on the success of plastic brine tanks used for more than 30 years in the water softening industry, the Marathon water heater is made to last.

Energy Efficient

The design and construction of the Marathon water heater allows it to store and insulate your home's water much the same as a carafe or Thermos™. Energy is used to heat the water one time only, saving money and energy from re-heating stored water at the time of use.

Installation Friendly

Lightweight and easy to connect is what we mean when we say the Marathon water heater is installation friendly. The tank comes complete for easy, professional installation.

Buy the water heater with staying power.

Buy the Marathon water heater and get more than you bargained for – a lifetime guarantee. Nothing else you can do for your home will give you the peace of mind that comes with a Marathon. You may also qualify for financing programs through your local electric cooperative. Give them a call for details.

Energy Answer

Let the Marathon water heater become your silent partner in the quest to save energy and money. You'll never have to worry about a leaky or faulty water heater because the Marathon water heater is seamless. Its ergo-dynamic design reduces sediment build-up and eliminates leaks. It also keeps a large supply of water hot and ready to use at the turn of a faucet. And you won't even know it's there until you see the energy savings on your utility bills. The Marathon water heater may be the last water heater you'll ever buy.

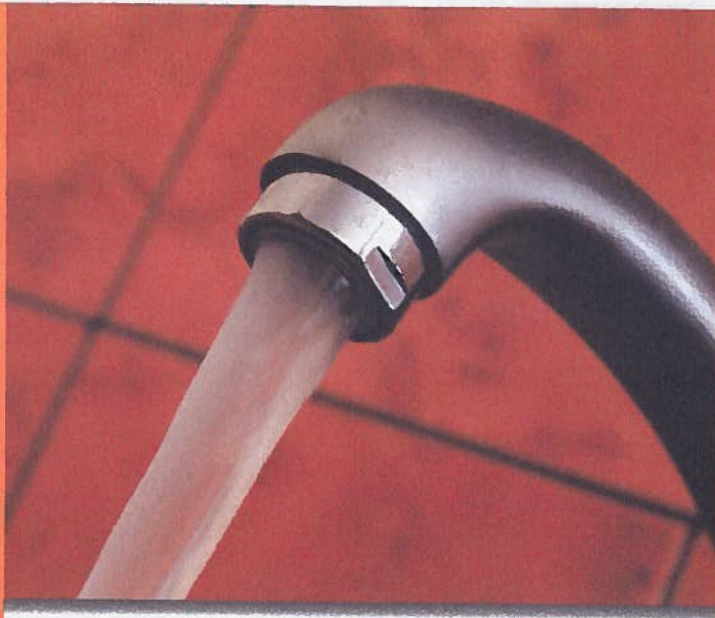
Gallon Capacity	Energy Factor	Diameter In Inches	Height In Inches
30	.94	21 5/8	53
40	.94	21 5/8	65 1/2
50	.94	23 1/2	66 3/4
50	.90	28 1/4	47 1/4
75	.92	28 1/4	62 5/8
85	.92	28 1/4	70 1/4
105	.91	30 1/4	70 3/4

4500 watt dual elements standard
Meets ASHRAE standard 90A
See your Marathon dealer for pricing, availability and complete warranty information.

Marathon
WATER HEATERS

For hot water that's there when you need it and when you don't.

For more information about a free home energy audit call 1-800-482-1277 or visit www.ecark.org.



The MARATHON Advantage

- *Advanced design outlasts the competition*
- *Durable water heater with a warranty to match*
- *No seams...No leaks!*
- *Lightweight*
- *Easy to install*



**Electric Cooperatives
of Arkansas**

Your Local Energy Partners
www.ecark.org

1 Cooperative Way
P.O. Box 194208
Little Rock, AR 72219-4208
501 570 2200

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**ENERGY EFFICIENCY
IN A MANUFACTURED HOME**

**SAVE ENERGY | SAVE MONEY
LIVE COMFORTABLY**



**Electric Cooperatives
of Arkansas**

Your Local Energy Partners
www.ecark.org



Site Your Home Properly

Make sure your dealer grades the site properly. Poor grading can lead to settling and moisture problems.

Have the long sides of your home face north and south and the short sides east and west to take advantage of the sun's heat in winter and provide the greatest protection from the summer sun.

Limit the Sun

When possible, strategically position your home or plant trees to protect it from unwanted summer sun and act as a windbreak in winter.

Exterior solar shade screens can effectively shade east and west windows and enhance privacy.

While shading windows on the outside is most effective, **using light colored shades or blinds** to reflect sunlight back through the glass will also help reduce air conditioning costs.

Roofing

For metal roof homes, **apply a reflective coating to reduce cooling costs** and provide protection against water leaks.

If your home has a shingled roof, **use light-colored shingles to keep attic space cooler.**

Ductwork

Make sure ductwork is airtight and well insulated.

Seal any holes in the floor sheathing.

Make sure any ducts that cross over to another section are **properly joined with a mastic sealer.**

Energy Efficiency

Thanks to exciting developments in energy efficiency, a manufactured home can be an energy efficient home — saving you money and increasing your home's comfort, safety and durability. Like traditional site-built homes, many new manufactured homes are designed to be energy efficient and use renewable energy systems. But even older homes may be remodeled or retrofitted for both.

HVAC

If your home has an old or inefficient heating and cooling system, consider **replacing it with a new Energy Star unit**. Make sure it is properly sized for your home.

Save hundreds each year by **upgrading from electric resistance heat to an electric heat pump**.

Change return air filters monthly.

Have your system tuned up annually to maintain maximum efficiency.

Set the thermostat to 78° in the summer; 68° in the winter.

Insulation

Since the ceiling, wall and floor cavities for many manufactured homes are sealed, it is difficult to add insulation. However, some models have attic spaces in which you can **install extra insulation** and some insulation companies can blow insulation into the floor cavity.

In new homes, **look for a minimum R-value of R-11** for walls, R-19 for floors, and R-30 for ceilings.

Make sure insulation has not shifted during transit before joining multi-section homes.

See that the “marriage walls” are airtight with foam gaskets installed between sections.

Seal all plumbing and wiring penetrations using expanding foam or caulk.

For more information, contact the Electric Cooperatives of Arkansas at 1-800-482-1277 or visit www.ecark.org.

Appliances and Furnishings

Always choose Energy Star products including appliances, HVAC and lighting.

Set the water heater to 120°.

Make sure the clothes dryer is vented to the outdoors and away from heating and air conditioning components.

Windows and Doors

If replacing windows, **use insulated glass** with a thermal break for metal frames and low-e glass.

Weatherstrip all doors and windows.

Install storm doors and windows.

Skirting

Install vinyl or metal skirting or a foundation wall to protect the home's underbelly and duct connections.

Install a continuous vapor barrier — like heavy plastic — under the home.

Shop Wisely

Most manufacturers offer energy efficiency options for new homes. While they may add to the purchase price, they can save thousands of dollars over the life of your home and greatly increase its comfort and value.



**Electric Cooperatives
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1 Cooperative Way
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**Hot Technology
Hot Savings**

The hot, new
GeoSpring™
hybrid water
heater.



Hybrid water heater
technology helps you

SAVE

on your 2nd largest
household energy
expense.

***Did you know that the water heater is the
second highest energy user in your home?***

The Electric Cooperatives of Arkansas are partnering with national appliance manufacturer General Electric to offer a new hybrid heat pump electric water heater. The GeoSpring™ Hybrid Water Heater consumes up to 62% less energy than a standard electric water heater.

ENERGY-SAVING BENEFITS

- Provides the same amount of hot water while using less energy.*
- Designed to absorb heat in ambient air and transfer it to heat the water.

MONEY-SAVING BENEFITS

- Save approximately \$320 per year – that's \$3,200 savings in energy costs over a 10 year period.
- Save up to 62% on energy bill tied to water heating.**
- Exceeds ENERGY STAR® standards with a rating of 2.35 energy factor.
- 10-Year Limited Warranty
 - > One year limited parts and labor
 - > Additional nine year limited parts

INSTALLATION

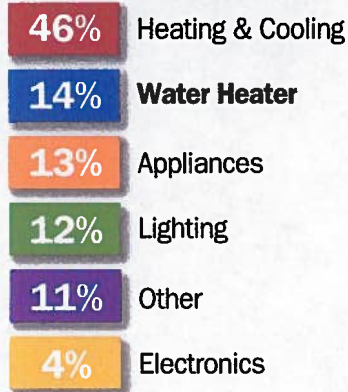
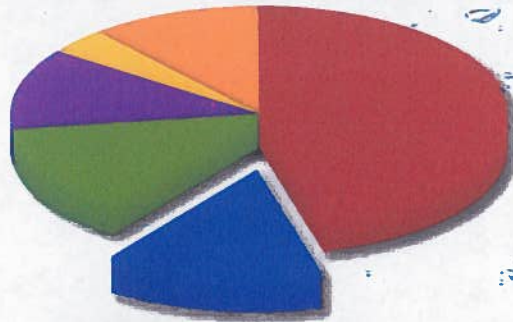
- Offers easy replacement of standard electric water heater.
- Fits in a similar footprint as a standard 50-gallon water heater.
- Uses existing water/electrical connections.



1-800-451-8061



U.S. Household Energy Use



INCENTIVES

- Federal tax credit of 30% on the purchase and installation price. Some restrictions may apply.
- An additional \$200 rebate will become available in March 2010 from the Arkansas Energy Office. Visit www.energystar.gov and www.arkansasenergy.org for incentive details.

For more information, contact:

Arkansas Electric Cooperatives, Inc.
1-800-451-8061



**Arkansas Electric
Cooperatives, Inc.**

Your Local Energy Partners

**Based on 2300 KWh per year vs. standard 50-gallon tank usage of 4800 KWh per year*

*** Compared to 50-gallon standard electric water heater*

www.aecisales.com

**GeoSpring™ Hybrid Water Heater
Dimensions & Weight:**

Overall Depth 21 3/4 inches

Overall Height 60 1/2 inches

Overall Width 21 3/4 inches

Approximate

Shipping Weight 215 lbs



**Arkansas Electric
Cooperatives, Inc.**

Your Local Energy Partners

For more information, contact:

***Arkansas Electric Cooperatives, Inc.
1-800-451-8061***

Exhibit 14



**Arkansas Electric
Cooperative Corporation**

1 Cooperative Way
P.O. Box 194208
Little Rock, Arkansas 72219-4208
(501) 570-2200

17 May 2011

Mr. Tim Scott
EEA Coordinator
Arkansas Energy Office
900 West Capitol Ave. Ste. 400
Little Rock, Arkansas 72201

Dear Mr. Scott:

Please find attached a voluntary contribution of \$112,463.35 from the Electric Cooperatives of Arkansas ("Electric Cooperatives") to fund Energy Efficiency Arkansas Program ("Program") expenses. This contribution represents the Electric Cooperatives' pro-rata share of Program costs for the period 1 January 2011 through 31 December 2011.

For clarity, The Electric Cooperatives' contribution is voluntary and the Electric Cooperatives were not signers of the Memorandum of Understanding and were not a party to Arkansas Public Service Commission Docket No. 07-083-TF.

Please direct any questions regarding this contribution to me at 501-570-2422.

Sincerely,

A handwritten signature in cursive script that reads "Forest Kessinger".

Forest Kessinger
Manager, Rates and Forecasting

Member Managers Ricky Bittle
Gary Voigt Robert Shields
Doug White

April 13, 2011

Mr. Forest Kessinger
Manager Rates & Forecasting
Arkansas Electric Cooperatives Corporation
1 Cooperative Way
Little Rock, Arkansas 72219-4208

RE: Energy Efficiency Arkansas - Budget Allocation

Dear Mr. Kessinger,

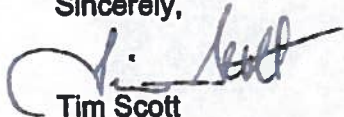
In accordance with the Memorandum of Understanding signed by Arkansas Electric Cooperatives Corporation and pursuant to the Public Service Commission Docket No. 07-083-TF, Order No. 24, please remit \$112,463.35 the pro-rata share for Arkansas Electric Cooperatives Corporation for programs and activities for the period of January 1, 2011 through December 31, 2011, under the Energy Efficiency Arkansas statewide information and education initiative. The check should be made to the AEDC – Energy Office at the following address:

AEDC-Energy Office
900 West Capitol Ave. Ste 400
Little Rock, Arkansas 72201

For your convenience, a copy of the cost breakdown by company is attached.

If you have any questions, please contact Tim Scott, Arkansas Energy Office, at 501-682-2433 or tscott@arkansasedc.com.

Sincerely,



Tim Scott
EEA Coordinator
Arkansas Energy Office

RECEIVED

APR 20 2011

A.E.C.C.
Plan. Rates & Disp

**Distribution of EEA
Comprehensive Program Costs
Amended MOU 11/1/2010**

Invoice Amounts by Year

	07/01/10 - 12/31/10	Invoice Total Billed 7/2010	Over payment based on Revised MOU	01/01/11 - 12/31/11	New Invoice Total (Invoice total 2011 minus Over payment based on Amended MOU)	Projected Invoice 01/01/12 - 12/31/12	Revised Comprehensive MOU Invoice Totals
Utility							
Arkansas Valley Electric Cooperative Corporation	7,165.45	10,323.51	(3,158.06)	13,984.67	10,826.61	14,151.22	35,301
Ashley-Chicot Electric Cooperative Inc.	839.47	1,053.10	(213.63)	1,639.38	1,424.76	1,657.90	4,136
C&L Electric Cooperative Corporation	3,198.68	4,318.15	(1,119.46)	6,242.81	5,123.35	6,317.16	15,768
Camell Electric Cooperative Corporation	11,047.11	15,303.85	(4,256.74)	21,560.43	17,303.69	21,817.20	54,425
Clay County Electric Cooperative Corporation	2,176.12	2,641.24	(465.12)	4,247.08	3,781.96	4,297.66	10,721
Craghead Electric Cooperative Corporation	6,356.08	6,519.49	(163.41)	12,405.04	12,241.63	12,552.77	31,314
Empire District Electric Company, The	904.83	974.32	(69.50)	1,765.94	1,636.44	1,796.97	4,458
Energy Arkansas, Inc.	160,994.59	177,216.49	(16,221.91)	314,210.05	297,988.14	317,952.04	793,167
Farmers Electric Cooperative Corporation	947.08	1,146.97	(199.89)	1,848.41	1,648.52	1,870.42	4,666
First Electric Cooperative Corporation	11,457.16	16,503.56	(5,146.40)	22,380.72	17,214.32	22,627.02	55,445
Mississippi County Electric Cooperative, Inc.	911.75	1,027.39	(115.64)	1,779.45	1,563.81	1,800.64	4,482
North Arkansas Electric Cooperative, Inc.	5,209.13	7,218.18	(2,009.05)	10,166.56	8,157.50	10,267.63	25,663
Oklahoma Gas and Electric Company	13,129.08	14,541.85	(1,412.77)	25,623.78	24,211.01	25,928.94	64,682
Ouachita Electric Cooperative Corporation	1,595.48	2,007.75	(412.27)	3,113.87	2,701.61	3,160.96	7,860
Ozarks Electric Cooperative Corporation	7,382.61	10,716.19	(3,333.58)	14,408.49	11,074.91	14,580.08	36,371
Petill Jean Electric Cooperative Corporation	2,979.94	3,914.72	(934.78)	5,815.90	4,881.11	5,885.16	14,681
Rich Mountain Electric Cooperative, Inc.	1,077.55	1,578.42	(501.87)	2,103.03	1,601.17	2,128.08	5,309
South Central Arkansas Electric Cooperative, Inc.	1,585.74	2,101.61	(515.88)	3,094.85	2,578.97	3,131.71	7,812
Southwest Arkansas Electric Cooperative Corporation	4,131.87	5,429.26	(1,297.39)	8,064.09	6,768.69	8,160.12	20,356
Southwestern Electric Power Company	24,472.85	26,323.72	(1,850.87)	47,763.19	45,912.33	48,332.02	120,568
Woodruff Electric Cooperative Corporation	2,430.20	3,700.43	(1,270.23)	4,742.98	3,472.75	4,799.47	11,973
Arkansas Oklahoma Gas Corporation	8,428.13	10,001.21	(1,573.08)	16,449.01	14,375.92	16,644.91	41,522
Arkansas Western Gas Company - Northwest and Northeast Arkansas Regions	27,767.77	33,049.84	(5,282.06)	54,232.87	48,970.80	54,878.74	136,899
CenterPoint Energy Arkla, a division of CenterPoint Energy Resources Corp	76,186.33	91,696.72	(15,510.39)	148,691.39	133,161.00	150,462.19	375,340
Subtotal	\$ 382,395.00	\$ 449,498.00	\$ (67,014.00)	\$ 746,313.00	\$ 679,299.00	\$ 755,201.00	1,893,909
Previous MOU Schedule A	\$ 449,498.00	\$	\$	\$ 712,022.00	\$	\$ 722,478.00	1,893,909
Variance	\$ (67,014.00)	\$	\$	\$ 34,291.00	\$	\$ 32,723.00	347,283
Combined Invoice for Cooperatives	\$ 70,491.43	\$ 95,604.94	\$ (25,113.41)	\$ 137,576.76	\$ 112,465.35	\$ 139,215.20	\$ 347,283
AEEC							

New Invoice Total Column reflects the period of 1/1/2011-12/31/2011. The total is the actual invoice for 2011 minus overpayment reflected in 7/1/2010-12/31/2010 term period which was invoiced in 6/26/10

DISBURSEMENT AUTHORIZATION VOUCHER

Nº 020219

Date 17 May 2011

Amount \$ 112,463.35

PAY TO: Name A EDC - Energy Office
Address A EDC - Energy Office, 900 West Capital Ave. Ste 400
Little Rock, AR 72201

For: The Electric Cooperatives Contribution to Energy Efficiency
Arkansas for the period 1 Jan through 31 Dec 2011.

Give Check To: Mail
Charge To: Project Code # 1
07-713-930.2.61
Authorized By: [Signature]

Electric Cooperatives of Arkansas

**Demand
Response Report
for the
Electric Cooperatives of
Arkansas**



**Arkansas Electric
Cooperative Corp.**

Your Local Energy Partner

**Rates and Forecasting Department
Arkansas Electric Cooperative Corporation**

The Electric Cooperatives' Demand Response Report

The Electric Cooperatives are the National Leader in Demand Response Programs:

The Electric Cooperatives of Arkansas, consisting of Arkansas Electric Cooperative Corporation ("AECC") and its seventeen member cooperatives¹, have been the most aggressive and successful utility system in the nation with regard to offering and implementing demand response programs.

On 18 August 2010 at 1800 hours CDST, AECC established an annual summer firm peak demand of approximately 2,130 MW. At that time, the Electric Cooperatives had an additional approximate 705 MW of potential demand that was either being interrupted or was available for interruption (interruptible demand). This ratio of interruptible demand to total potential demand (actual firm demand plus potential interruptible demand) is approximately 25%. The ratio of interruptible demand to firm demand is approximately 33%. The Electric Cooperatives do not know of another electric utility system in the nation with a higher ratio of demand response to load.

The Electric Cooperatives' demand response efforts are so significant that they provide approximately one half of the demand response found within the entire Southwest Power Pool ("SPP") footprint. The SPP is one of nine Regional Reliability Councils within the North American Reliability Corporation (NERC). A January 2009 publication titled *Retail Demand Response in Southwest Power Pool* ("SPP Report") determined that the 30 load-serving entities within SPP have a potential demand response of 1,552 MW. The SPP Report further states that: "Arkansas accounts for ~50% of the DR [demand response] resources in the SPP footprint; these DR resources are primarily managed by cooperatives."² (i.e., the Electric Cooperatives)

1 Arkansas Valley Electric Cooperative Corporation; Ashley-Chicot Electric Cooperative, Incorporated; C&L Electric Cooperative Corporation; Carroll Electric Cooperative Corporation; Clay County Electric Cooperative Corporation; Craighead Electric Cooperative Corporation; Farmers Electric Cooperative Corporation; First Electric Cooperative Corporation; Mississippi County Electric Cooperative, Inc.; North Arkansas Electric Cooperative, Incorporated; Ouachita Electric Cooperative Corporation; Ozarks Electric Cooperative Corporation; Petit Jean Electric Cooperative Corporation; Rich Mountain Electric Cooperative, Incorporated; South Central Arkansas Electric Cooperative, Incorporated; Southwest Arkansas Electric Cooperative Corporation; and Woodruff Electric Cooperative Corporation

2 Bharvirkar, Ranjit; Heffner, Grayson; and Goldman, Charles, *Retail Demand Response in Southwest Power Pool*, Ernest Orlando Lawrence Berkeley National Laboratory, prepared for the Office of Electricity Delivery and Energy Reliability, Permitting, Siting, and Analysis, U.S. Department of Energy, 2009, (v)

To fully appreciate the magnitude of the Electric Cooperatives' demand response efforts, one may look at the Electric Cooperatives' relative position within the SPP. The SPP covers a geographic area of approximately 255,000 square miles. The SPP is charged with regional reliability and provides transmission oversight to portions of Arkansas, Kansas, Louisiana, Missouri, Nebraska, New Mexico, Oklahoma, and Texas. The 30 load serving entities within the SPP provide electrical service to approximately 4.5 million customers and have a non-coincident peak demand of approximately 43,000 MW.

The Electric Cooperatives' Approach to Successful Demand Response:

The Electric Cooperatives' success in demand response has been achieved through many years of steady effort. In 1978, certain member cooperatives began using clock timer switches to control water heaters and irrigations loads. Clock switches were eventually replaced by radio-controlled load switches. As demand response became more prevalent, a statewide System Control and Data Acquisition ("SCADA") system was installed to provide the Electric Cooperatives with more sophisticated and timely load data. The receipt of virtually instantaneous data allowed the Electric Cooperatives to more surgically direct their demand response efforts.

The Electric Cooperatives continue to maintain their state-of-the-art approach to demand response by using the Internet to directly provide participating commercial and industrial ("C&I") retail consumers with current, minute-by-minute, AECC load data. This data allows participating C&I consumers to better choose how to operate their businesses during peak summer periods.

To encourage demand response, the Electric Cooperatives have maintained rates and charges that closely adhere to their cost of service. These rates and charges provide the economic incentives for retail consumers to voluntarily participate in demand response.

Perhaps the SPP Report best summarized the Electric Cooperatives' approach when it stated: "The very high penetration levels of demand response in Arkansas cooperatives can be traced to three factors: (i) long-term stability in the type of price signals sent; and (ii) sufficient bill savings potential to gain active customer participation and interest; and (iii) avoiding over-payment of incentives, so there is sufficient savings for participants, non-participants, and utility management."

Demand Response Program Description:

While each member cooperative may have certain terms and conditions that are specific to their demand response offerings, and not every member

cooperative offers both Category 1 and Category 2 demand response, all of the Electric Cooperatives' demand response offerings fall within three basic categories. These categories are:

Table-1

D.R. Category	Demand Response Program	Achieved Demand Response
1	Member Co-op Direct Control	120 MW
2	Member Co-op C&I Voluntary Peak Avoidance	65 MW
3	AECC Controlled Industrial Loads	520 MW
	Total	705 MW

Category 1 – Member Cooperative Direct Control:

In Category 1 demand response (member cooperative direct control), each participating member cooperative receives current AECC system load data. This load data allows the member cooperatives to evaluate and determine when AECC summer peaks are imminent. Using this data, the member cooperatives control participating retail loads, thus reducing the member cooperative's contribution to AECC's summer peaks. The economic benefit to the member cooperatives is a reduced wholesale electric bill. This occurs because AECC's wholesale billing demand determinants are based on each member cooperative's contribution to AECC's summer peaks. Reductions in the member cooperative's wholesale demand charge allow the member cooperative to reduce its rates and charges to its participating retail consumers. Through various surveys, AECC has identified approximately 170 MW of potential member cooperative direct demand response within Category 1. This 170 MW is achieved through the installation of approximately 40,000 load control switches by eleven member cooperatives. These switches are primarily installed on water pumping, air-conditioning, and water heating loads. AECC believes that these switches effectively remove approximately 120 MW from AECC's summer peaks. The difference between the 170 MW of installed Category 1 demand response and the approximate 120 MW of achieved demand response is primarily due to the necessary cycling of controlled loads during the summer peak periods.

Category 2 - C&I Voluntary Peak Avoidance:

In Category 2 demand response (C&I Voluntary Peak Avoidance), each participating member cooperative offers a rate incentive to participating C&I consumers. This incentive encourages the C&I consumer to voluntarily reduce its demand during periods when AECC summer peaks are imminent. Under Category 2 demand response, participating C&I consumers receive current demand data from AECC through the Internet. This information aids the

participating C&I consumer in evaluating their need to interrupt. The participating member cooperatives then use advanced metering to determine the participating C&I consumer's demand at the time of AECC's summer peaks. As with Category 1 demand response, AECC's wholesale rates and charges are designed to provide the member cooperatives with a reduced wholesale bill when their C&I consumers reduce their on peak demand. The member cooperatives accordingly reduce the participating C&I consumer's rates and charges. Currently, there are approximately 60 C&I consumers participating in Category 2 demand response. These C&I consumers have a non-coincident peak demand of approximately 105 MW. AECC conservatively estimates that approximately 65 MW of participating C&I demand is effectively reduced at the time of AECC's summer peak periods.

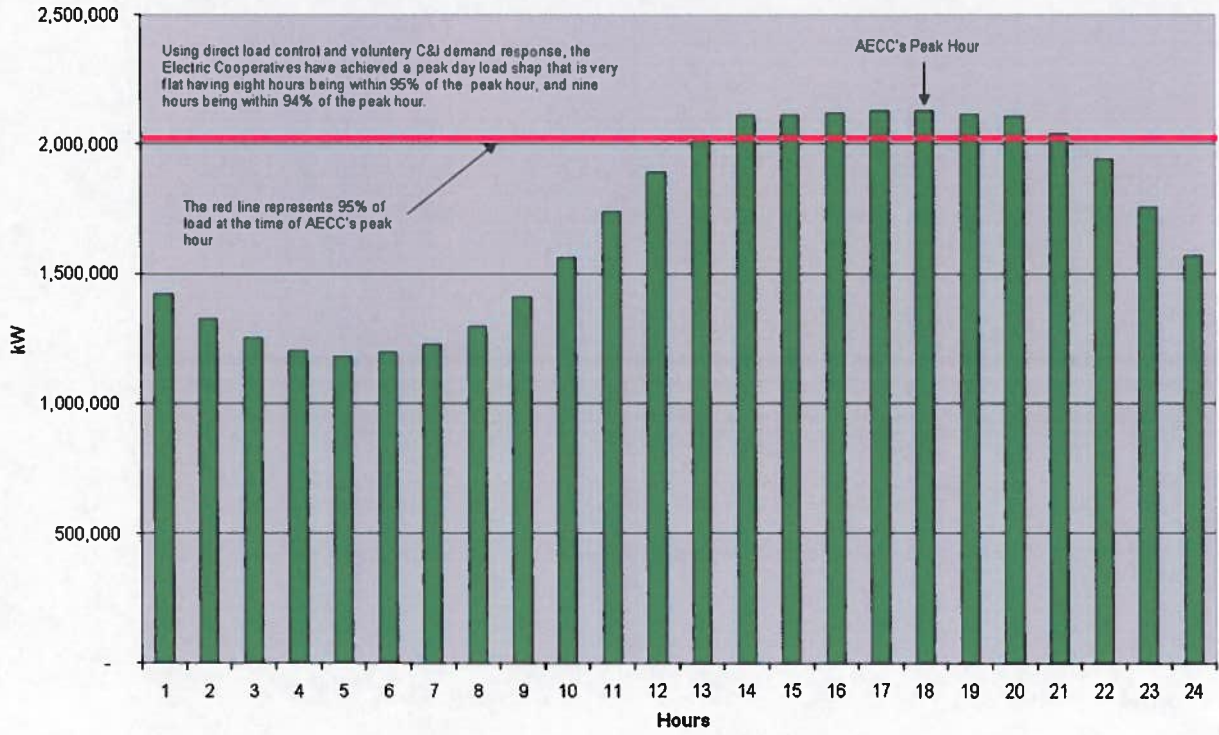
Effect of Combining Category 1 and 2 Demand Response on AECC's Summer Peak Day Load Shape:

Category 1 and 2 demand response programs (switch and voluntary C&I peak avoidance) have greatly flattened AECC's summer peak day load shape(s). During AECC's 2010 annual peak day, there were eight hours that fell within 95% of its firm peak hour (Graph 1). AECC estimates that without Category 1 and 2 demand response, only three hours would be within 95% of its peak hour.

The effect that Category 1 and 2 demand response has on AECC's 2009 peak day load shape may be observed in Graph 2. The green bars in Graph 2 represent AECC's actual 2009 peak day hourly load shapes. The red line represents an estimated peak day load shape if Category 1 and 2 demand response were not present.

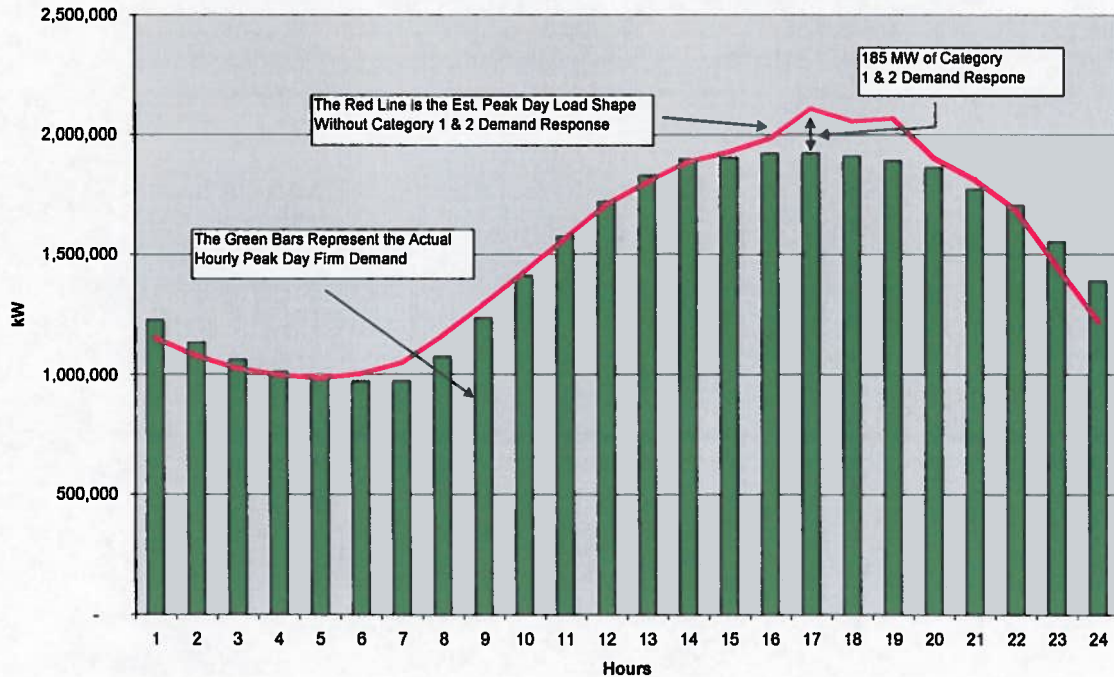
Graph-1

AECC's Firm Load Peak Day kW by Hour 2010



Graph-2

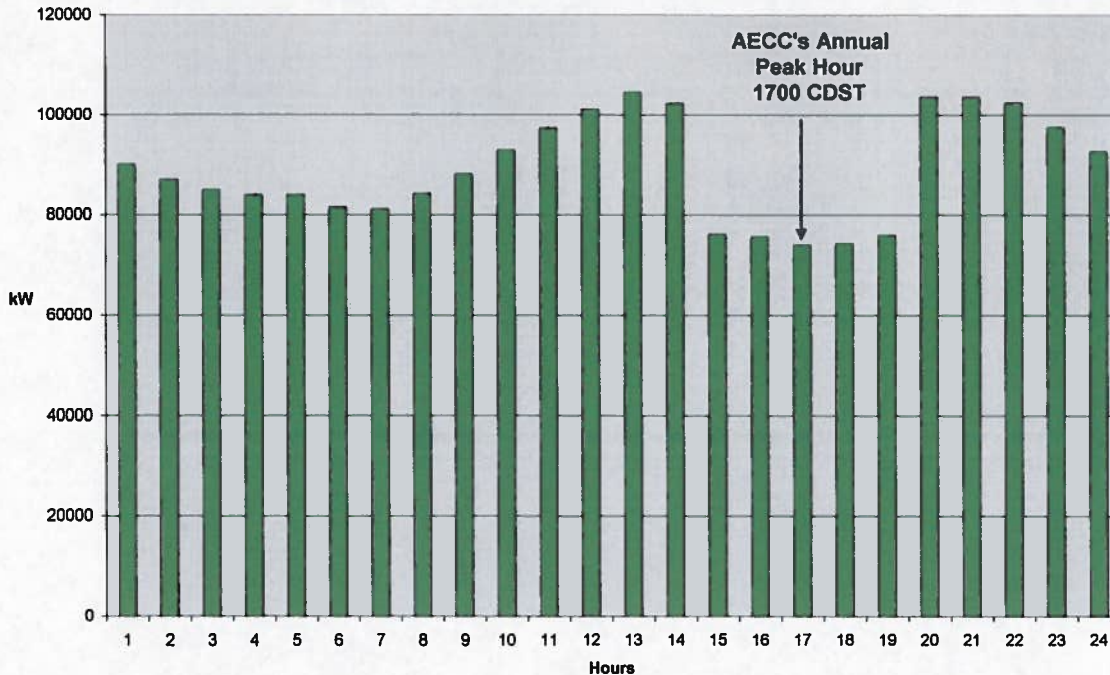
2009 AECC Load Shape Without Demand Response Switch & Voluntary Control



The graph shown below (Graph 3) illustrates the typical effect of Category 1 and 2 demand response on one member cooperative's actual twenty-four hour load shape. Using Category 1 and 2 demand response, this member cooperative dramatically reduced its load during the hours 1500 through 1900 CDST. These hours normally represent AECC's summer peak period.

Graph-3

A Member Cooperative's Actual Firm Load Shape on an Annual Peak Day



Category 3

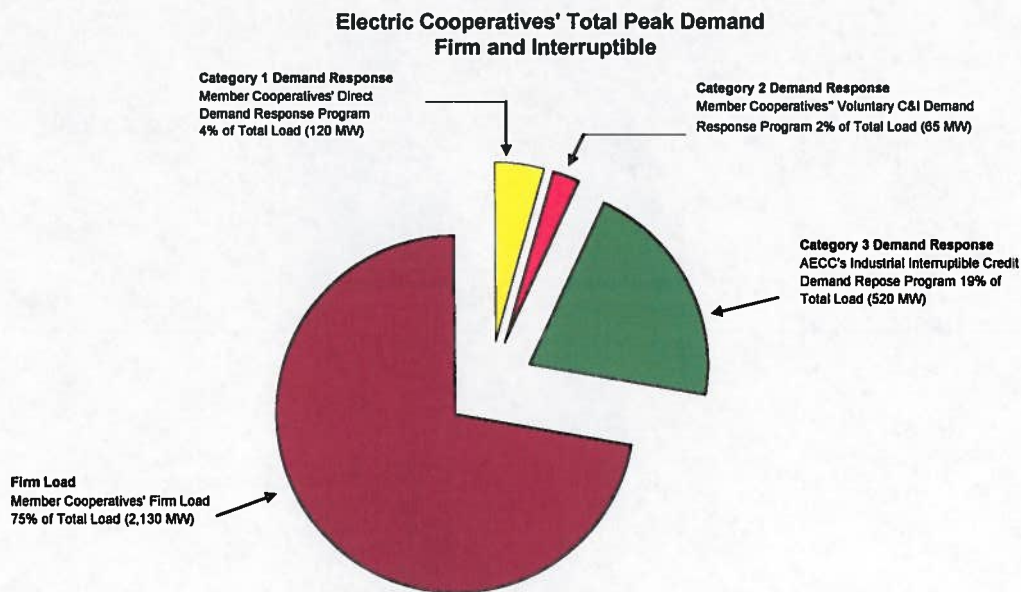
Category 3 demand response represents the direct control by AECC of participating retail industrial consumers whose loads are five MW or greater. Under Category 3 demand response, eight retail industrial consumers have voluntarily agreed to receive service under a member cooperative's extension of AECC's Interruptible Credit Rider. These eight industrial consumers have a combined potential maximum demand of approximately 520 MW. Participating industrial consumers, receiving service under the Interruptible Credit Rider are assigned to certain interruptible capacity blocks. Each block may be interrupted for only a limited number of hours each year. So long as AECC does not exceed the number of hours stated in the interruptible blocks, AECC may interrupt an industrial consumer when such interruptions could prevent the interruption of firm load. In addition, half the number of hours stated in each interruption block may be interrupted by AECC for any reason, including but not limited to, fuel economics.

When interrupting participating industrial consumers, AECC attempts to lessen the impact of the interruption by locating and offering any "buy-through" energy that is available on the wholesale market. Buy-through energy is not supported by capacity and may be interrupted with five minutes notice. While

buy-through energy is typically priced at the incremental cost of fuel or purchased energy, buy-through energy offers the interrupted industrial consumer the option of paying the incremental market price or being interrupted.

Total Impact of Category 1, 2, and 3 Demand Response:

The following graph demonstrates Categories 1, 2, and 3 demand response, as a ratio of total system potential demand (the Electric Cooperatives' potential demand, both firm and interruptible).



Impact on Long Term Capacity Needs and Reductions in Fixed Costs:

The Electric Cooperatives' demand response programs currently allow AECC to avoid approximately 811 MW of generation peaking capacity. This number is derived from 705 MW of demand response plus an additional 106 MW of generating reserves (AECC targets a 15% reserve margin). While the region's capacity market is currently distressed and peaking capacity may be purchased for less than the cost of new construction, AECC's generation planning department estimates that the investment cost of newly constructed peaking capacity would be approximately \$800 per kW. If AECC were to acquire 811 MW on additional peaking capacity at \$800 per kW it would result in approximately \$649 million of new investment along with its associated cost of ownership, operation, and maintenance. This number would not include any necessary transmission investment to interconnect the capacity.

Impact on the Cost of Energy:

The Electric Cooperatives recently added a new feature to Category 3 demand response which allows AECC to interrupt up to one half of the number of hours stated in the interruptible blocks for any reason. By using these available hours to reduce AECC's load during times when the cost of fuel and purchased energy is greatest, AECC has avoided several million dollars in incremental fuel and purchased energy costs. This savings directly reduces the necessary collection of these costs under AECC's Fuel and Purchased Energy Rider (energy adder).

Reliability:

The use of demand response has successfully avoided capacity shortages on numerous occasions.

Industrial Expansion and Growth:

Demand response is essential in attracting and maintaining industry in the Electric Cooperatives' service territory. Of the nine industries currently participating in Category 3 demand response, seven were established after Category 3 demand response was made available.

Future Innovation - Voltage Reduction and Automated Metering Infrastructure:

Certain member cooperatives are currently experimenting with voltage reduction as a means of achieving demand response. Using this method, one member cooperative believes that it has successfully reduced its summer peak by approximately one MW. This reduction is being achieved by applying voltage reduction to a relatively small portion of its system. The member cooperative believes that if voltage reduction can be successfully applied to the remainder of its system a reduction of approximately five MW might be achieved. A second member cooperative has similarly experimented with voltage reduction and believes that it has achieved a reduction of approximately three MW. A third member cooperative plans to implement voltage reduction in the near future.

Currently, certain member cooperatives are exploring the advantages of Advanced Metering Infrastructure (AMI) systems and how these systems might be used to achieve more efficient demand response.

Electric Cooperatives of Arkansas

***SMART
GRID
INITIATIVES
REPORT***

February 2, 2012



**Electric Cooperatives
of Arkansas**

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Questions and/or comments about this report may be directed to:

Robert McClanahan, VP/Chief Information Officer
Arkansas Electric Cooperative Corporation
Robert.McClanahan@aecc.com or (501) 570-2403

INTRODUCTION

The “Smart Grid”

The term “Smart Grid” continues to be the topic of much discussion in the electric industry. While some clarity has been added to the definition of Smart Grid since this report was first issued in 2008, a great deal of uncertainty still exists as to what the term really means. The long-term goal continues to be that of developing an electric transmission/distribution system utilizing intelligent devices and automation to improve the efficiency, reliability and resiliency of the “grid”. As described in Title XIII of the Energy Independence and Security Act of 2007, the general functions of the Smart Grid are, among others:

- Optimizing electric power asset utilization, allowing for the operation of the electric grid in its most efficient configuration;
- Promoting efficient end-use of electric energy by promoting demand response, including pricing signals to consumers, allowing energy consumers to make more educated energy usage decisions;
- Promoting the use of distributed generation, including localized solar- and wind-powered electric generators;
- Self-healing after a failure, by anticipating problems and automatically responding by re-routing power flows away from failed lines and equipment;
- Operating resiliently against man-made and natural disasters;
- Improving power quality for the digital economy, which is powered by sensitive electronic devices;
- Enabling new products, services and markets, many of which are unimagined at this time.

It will take many years before full implementation of a “Smart Grid” can occur. However, incremental improvements in system automation are important steps toward that goal.

Automation and The Electric Cooperatives of Arkansas

Cooperatives are industry leaders in implementing automation for electric distribution systems. Much of this springs from the very mission and nature of electric cooperatives compared to that of investor-owned utilities. Cooperatives generally have limited resources and staff. In addition, the Electric Cooperatives of Arkansas average six members per mile of line, while the investor-owned counterparts have customer densities approaching ten times this value. As a result, the Cooperatives’ facilities are spread over a proportionately larger geographical area for their respective size in number of members and staff. Automation initiatives therefore have a proportionately larger value for cooperatives relative to investor-owned utilities.

This report is an effort to catalog a wide range of electric distribution automation initiatives that are in place or being considered by the 17 electric distribution cooperatives in Arkansas. These initiatives not only serve to make the operations of the respective cooperatives more efficient, they have a significant impact on the efficiency of electric energy consumption, as well.

Cooperatives Surveyed

Arkansas Electric Cooperative Corporation (AECC), the wholesale power supplier for the Arkansas electric distribution cooperatives, developed a brief survey, titled the "Smart Grid Survey", and distributed it to the Distribution Cooperatives in early 2011. All 17 cooperatives participated in the survey. They are:

Arkansas Valley Electric Cooperative Corporation, Ozark;
Ashley-Chicot Electric Cooperative, Inc., Hamburg;
C&L Electric Cooperative Corporation, Star City;
Carroll Electric Cooperative Corporation, Berryville;
Clay County Electric Cooperative Corporation, Corning;
Craighead Electric Cooperative Corporation, Jonesboro;
Farmers Electric Cooperative Corporation, Newport;
First Electric Cooperative Corporation, Jacksonville;
Mississippi County Electric Cooperative, Inc., Blytheville;
North Arkansas Electric Cooperative, Inc., Salem;
Ouachita Electric Cooperative Corporation, Camden;
Ozarks Electric Cooperative Corporation, Fayetteville;
Petit Jean Electric Cooperative Corporation, Clinton;
Rich Mountain Electric Cooperative, Inc., Mena;
South Central Arkansas Electric Cooperative, Inc., Arkadelphia;
Southwest Arkansas Electric Cooperative Corporation, Texarkana;
Woodruff Electric Cooperative Corporation, Forrest City.

The following report summarizes the mid-2011 responses to that survey and is an update to the *2010 Smart Grid Technologies Survey Report* dated Feb. 26, 2010.

METERING INITIATIVES

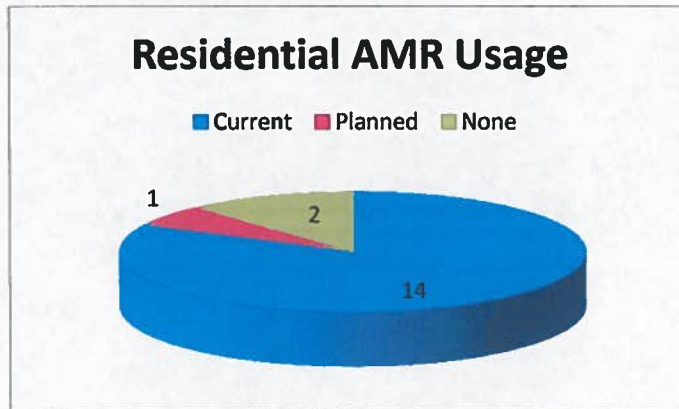
Automated Meter Reading

Automated meter reading (AMR) systems are among the earliest of field automation systems implemented by the cooperatives. Not only does AMR eliminate the need for a meter reader to record usage at each meter each month, it provides more accurate readings and provides data more often than once per month, allowing a better view into how electric consumption varies with time.

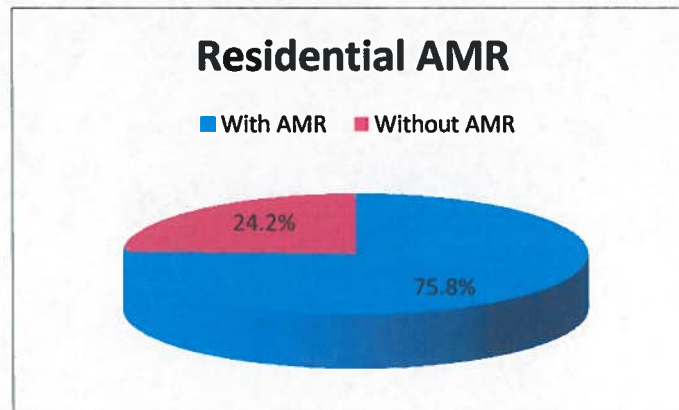
In addition to billing for electric service, the data and functionality provided by AMR systems has many uses, including:

- Verify outages and restoration of service;
- Identify failing or defective meters;
- Verify proper operation of load management controls;
- Identify possible theft of electric service;
- Balance loading on distribution circuits; and
- Calculate actual losses on distribution lines.

Fourteen of the 17 distribution cooperatives have AMR in place for residential members. One cooperative plans to add residential AMR in the near future.

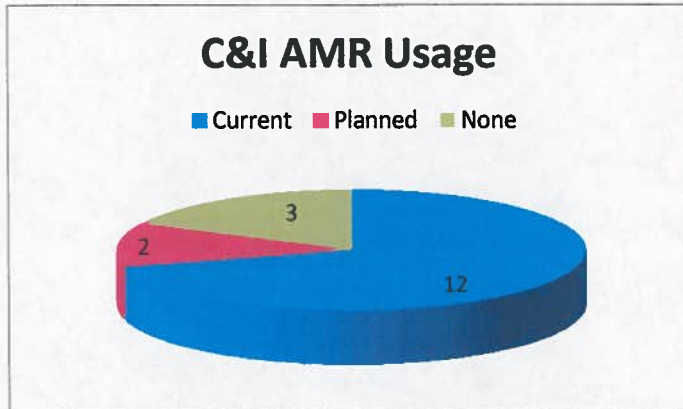


Out of the estimated 482,469 single-phase meters in service across all Arkansas distribution cooperatives at the time of this writing, an estimated 365,580 are AMR-enabled. This results in a penetration of residential AMR across the Electric Cooperatives of Arkansas of approximately 75 percent.

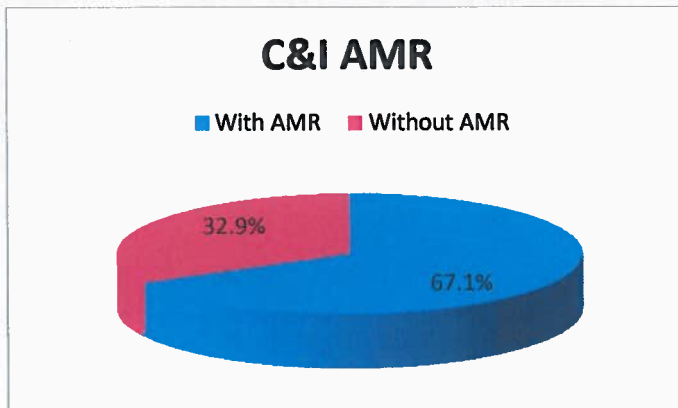


These figures represent an increase of 5 percent penetration and nearly 19,000 AMR-enabled meters since the 2010 survey.

Twelve cooperatives have AMR in place for commercial and industrial (C&I) members. Two cooperatives plan C&I implementations.



Out of an estimated total of 25,830 ployphase meters in service across all 17 distribution cooperatives, approximately 17,069 are AMR-enabled. This represents an increase of approximately 5,300 AMR-enabled ployphase meters since the 2010 survey. Current penetration of AMR for C&I meters across the Electric Cooperatives of Arkansas is approximately 67 percent, an increase of 8 percent since 2010.



In addition to the Arkansas electric distribution cooperatives, AECC has the ability to remotely read the revenue meters at all of its generation facilities, substations and meter points, both in real-time for operational purposes and after-the-fact for billing purposes. AECC reads a total of 300 meters at substations and meter points in this fashion. These meters provide AECC with metered values for each 15-minute period during the month. The metering interval for these meters will be shortened to a five-minute period to provide the granularity of meter data required by the SPP Integrated Markets. The implementation of this upgrade is currently scheduled to go live in March 2014.

Automated Metering Infrastructure

Recent developments in AMR implementations have led to some initiatives being reclassified as Automated Metering Infrastructure or AMI. AMI is differentiated from AMR by at least two characteristics: communications bandwidth and supported functions.

AMI implementations provide sufficient communications bandwidth to support two-way communications between a cooperative and a member's meter/premises. This channel can be used for far more than collecting meter readings. With the appropriate "gateway" device at the members' premise, the cooperative could eventually send pricing signals, load control signals and other such information to "smart" devices in homes and businesses. In addition, those devices could also send important information back to the cooperative for troubleshooting and monitoring purposes.

Two Arkansas electric distribution cooperatives are moving forward with AMI pilot projects. These projects are included in the summary of AMR projects above.

Time of Use/Hourly Reads

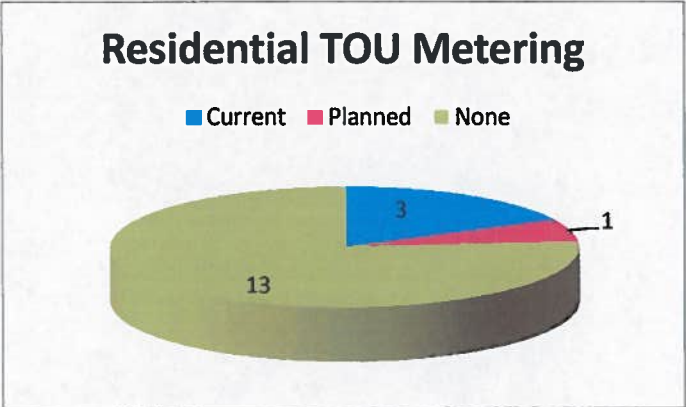
Time of use (TOU) metering provides the ability not only to record the amount of electric energy consumed at a metered location, but also to capture information related to when that energy was consumed.

Basic TOU meters simply record electric consumption into several registers or "buckets" based on the time of day. These registers are generally used to meter usage into on- and off-peak quantities.

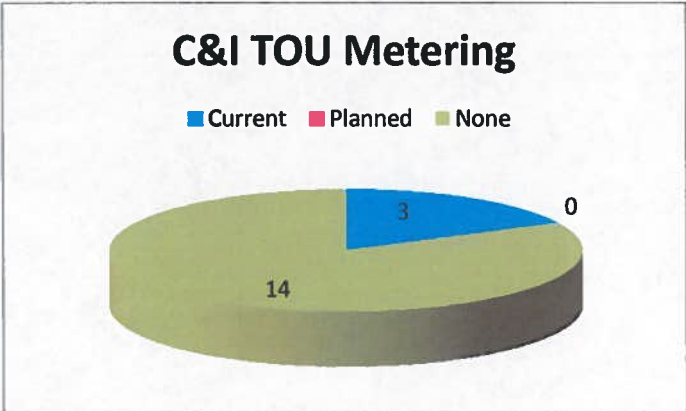
Some AMR systems offer the ability to capture a meter reading once each hour, not only implementing TOU metering, but also providing a load profile for the metered account.

Regardless of the specific type of TOU metering deployed, this data would make it possible for the cooperatives to implement some sort of time-of-use rates in the future.

Three cooperatives currently have TOU metering of one sort or another in place for residential members. One cooperative has plans to implement residential TOU metering in the future.



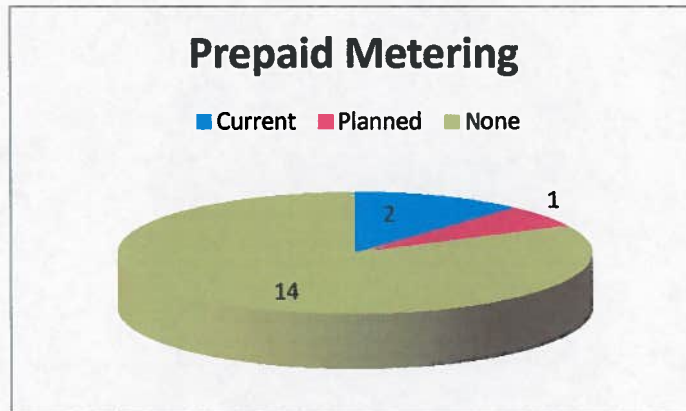
Three cooperatives have TOU metering for C&I Members.



Prepaid Metering

Prepaid metering allows electric consumers to prepay for electric service, in much the way that certain wireless telephone services allow customers to prepay for a certain number of minutes of usage. This functionality provides great benefit to the cooperative in savings related to service calls for disconnects/reconnects due to non-payment. It also benefits the participating cooperative member by allowing them to account and plan for their energy use as a part of their household budget, as well as helping them avoid charges related to disconnect/reconnect by keeping watch on the balance remaining on their prepaid account.

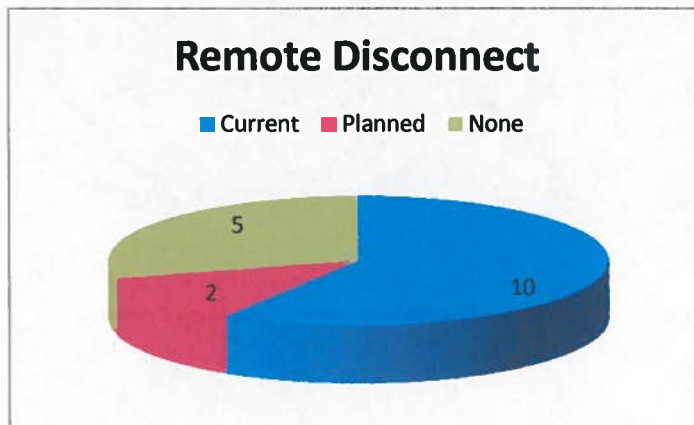
Three cooperatives utilize this technology, with one cooperative indicating a future implementation plan.



Remote Disconnect

Remote disconnect is another technology that can provide savings by eliminating service calls. This functionality provides the ability to disconnect service from the cooperative office, eliminating the need to dispatch a service truck to disconnect (or enable reconnect) service for non-payment, move-out or move-in.

Ten cooperatives have a portion of their meters with remote disconnect capability in place and two cooperatives plan to implement this functionality in the future.

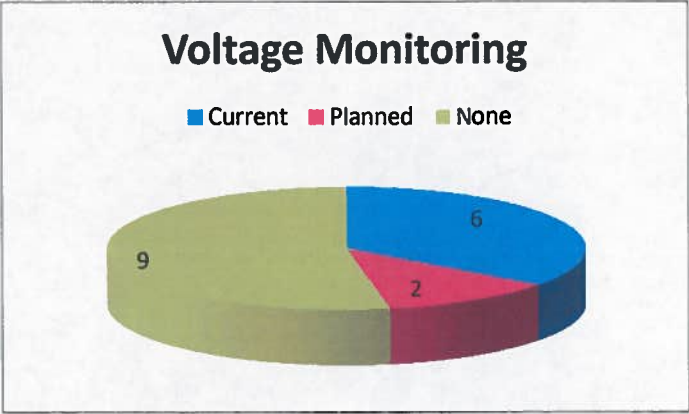


DISTRIBUTION AUTOMATION

Voltage Monitoring

Most AMR systems provide the capability to monitor the delivery voltage at the meter location, making it possible to identify and troubleshoot voltage problems at the consumer location more effectively.

Six cooperatives are using their AMR systems to monitor voltage, with another two cooperatives planning to implement in the near future.



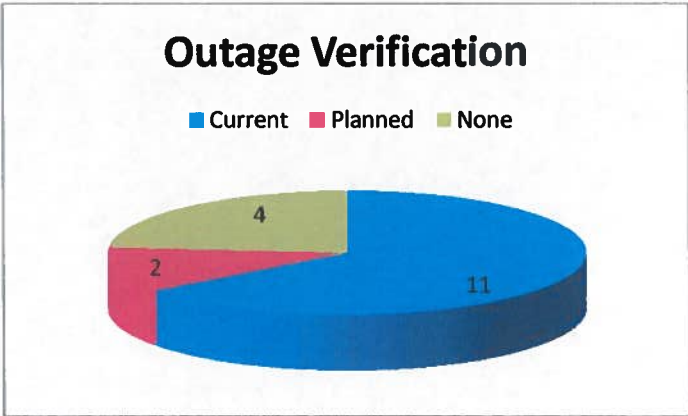
This represents an increase of one cooperative since the 2010 survey.

Outage Verification

Most AMR systems provide some means of identifying or verifying outages at each metered location. This is often accomplished by "pinging" a meter (polling the meter for an immediate read) to see if it responds. If the meter responds, there is electric service present at the meter socket as the AMR device requires electric power to function. If a meter does not respond to the "ping", an assumption can be made that no electric service is present and an outage condition exists at that location.

If the meter responds to the "ping" but the customer still reports an outage, the customer can be made aware of this fact and be directed to seek assistance in locating the trouble behind the meter in their premise.

Eleven cooperatives are using AMR systems for outage verification, while two more plan to do so in the near future.

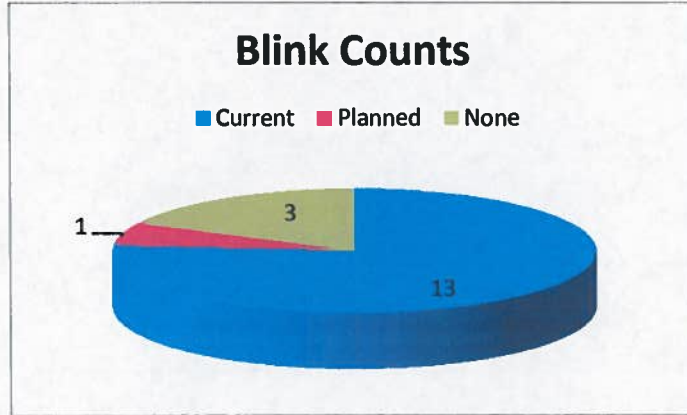


This represents an increase of one cooperative since the 2010 survey.

Blink Counts

Most AMR systems are capable of counting the number of voltage disturbances which result in the voltage at the meter dropping below a certain threshold (a "blink"). This allows a cooperative to identify distribution feeders, circuits and/or protection equipment that have problems.

Thirteen cooperatives collect blink counts, with one cooperative planning to add this feature in the near future.

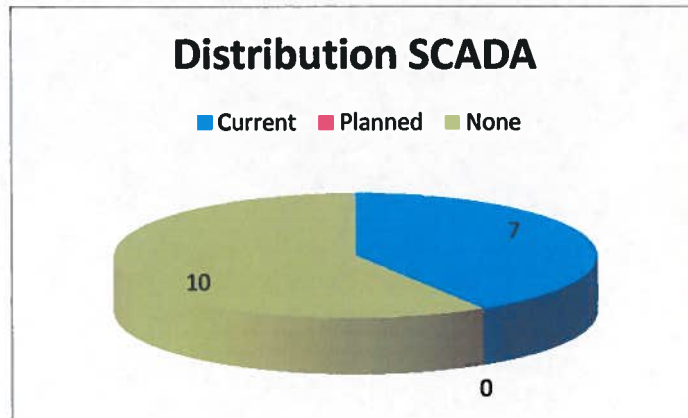


This represents an increase of one cooperative since the 2010 survey.

Supervisory Control and Data Acquisition

Supervisory Control And Data Acquisition (SCADA) systems allow a cooperative to monitor components and the operating characteristics of its distribution system, and to operate certain equipment remotely. SCADA is of great help in detecting issues before they become a problem and can also speed system restoration following a service disruption.

Seven cooperatives have implemented SCADA to date.



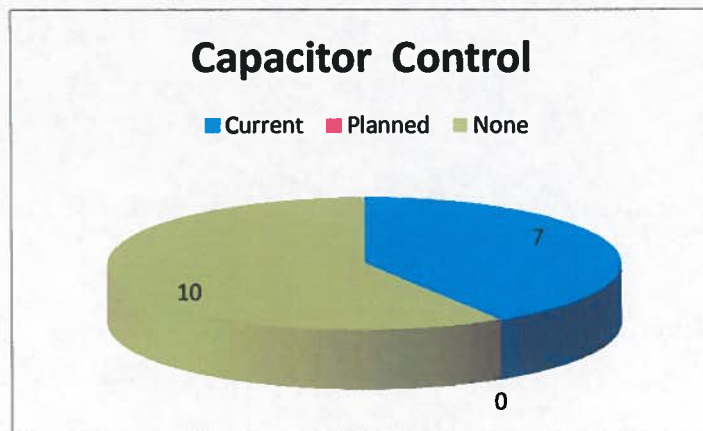
This represents an increase of two cooperatives over the five cooperatives reporting SCADA implementations in the 2010 survey.

In addition to the distribution cooperatives, AECC, like most electric utilities its size, has a SCADA system to monitor and control its transmission assets. Though AECC's transmission ownership is small, SCADA is an important tool in operating those transmission assets efficiently and reliably. There are currently 34 substations controlled by AECC's SCADA system, affecting approximately 312 miles of transmission. In addition to those stations with SCADA control, AECC has real-time monitoring of all of its generating plants, substations and meter points via SCADA.

Capacitor Control

Automatic capacitor switching for the purpose of managing power factor is another type of distribution automation currently in place at some distribution cooperatives. This allows the cooperative to add capacitors to or remove them from service as needed to maintain an efficient power factor.

Seven cooperatives employ such automation. This represents an increase of one cooperative over the six cooperatives reporting utilization of capacitor controls in the 2010 survey.



Communication Networks to Substations

Distribution automation initiatives, such as SCADA, AMR, and the deployment of other "smart" devices require some sort of communications channel to the substation. While some AMR systems are able to communicate via dial-up telephone connections, long distance charges to remote substations for the purpose of reading meters can mount quickly. As a result, the Arkansas electric distribution cooperatives have migrated from dial-up connections and adopted dedicated network connections.

In support of this effort, AECC has installed a private, Internet Protocol-based network to 100 percent of its metered points of delivery, which constitute approximately 85 percent of the cooperative meter points and substations in Arkansas. This network is

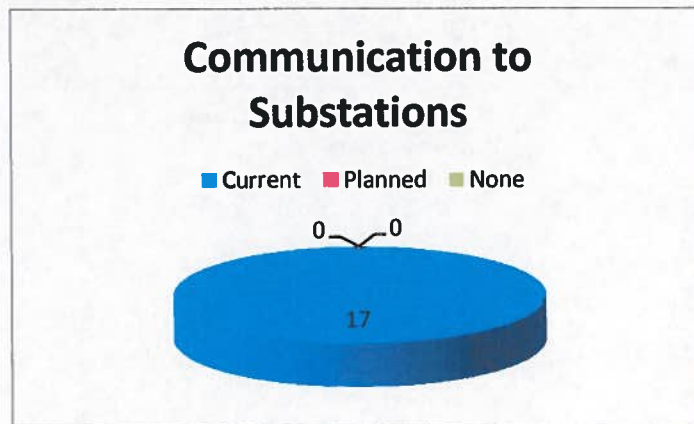
shared among the 17 Arkansas electric distribution cooperatives, a much more cost-effective method than each cooperative installing a proprietary dedicated network.

In addition, several cooperatives have extended AECC's network to locations where AECC does not have metering in order to communicate with their AMR systems.

This network links to approximately 300 physical locations in Arkansas, and includes the following types of communications technologies:

- Microwave radio links;
- Wireless Ethernet;
- Leased data circuits from telecommunications carriers;
- Satellite communications terminals; and
- Fiber-optic channels.

The network is designed to be scalable and flexible to support future communications needs, such as those required by additional "smart" devices at the substation.



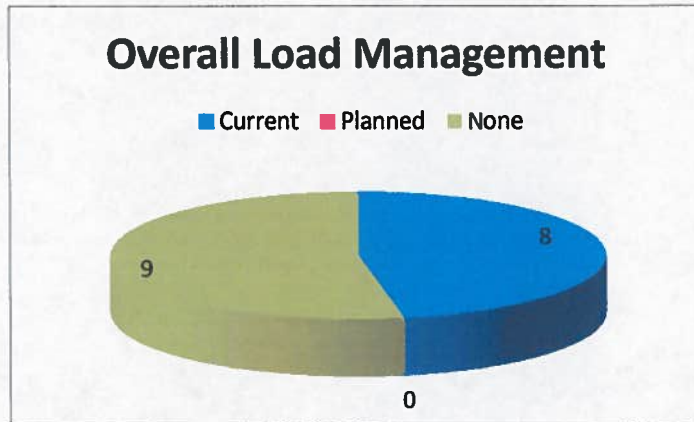
The chart above represents an increase of five cooperatives over the twelve cooperatives reporting substation communications in the 2010 survey.

DEMAND MANAGEMENT

The Electric Cooperatives of Arkansas are longtime leaders and innovators in demand management. Direct load control efforts on the part of eight of the electric distribution cooperatives (*see Irrigation Load Management and Other Load Management below*) result in the reduction of approximately 120 MW of firm demand on-peak. Indirect load control initiatives (*see Peak Avoidance Rate below*) result in the voluntary reduction of another 65 MW of demand on-peak.

In addition, the cooperatives collectively achieve approximately 520 MW of demand response through the retail application of AECC's wholesale Interruptible Credit ("IC") Rider.

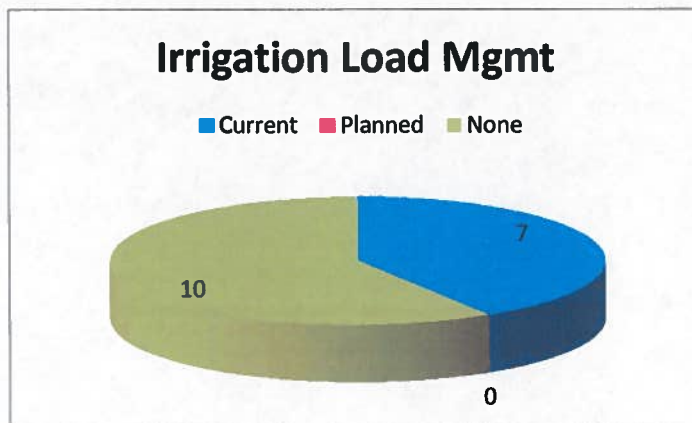
Approximately 27 percent of the total load of the Arkansas electric distribution cooperatives is, in some manner, responsive during periods of peak demand.



Irrigation Load Management

Irrigation load management is used to interrupt service to agricultural irrigation pumps for four to six hours-per-day during periods of peak demand. In exchange for this control capability, farmers receive a lower rate for the electricity used to power the pumps.

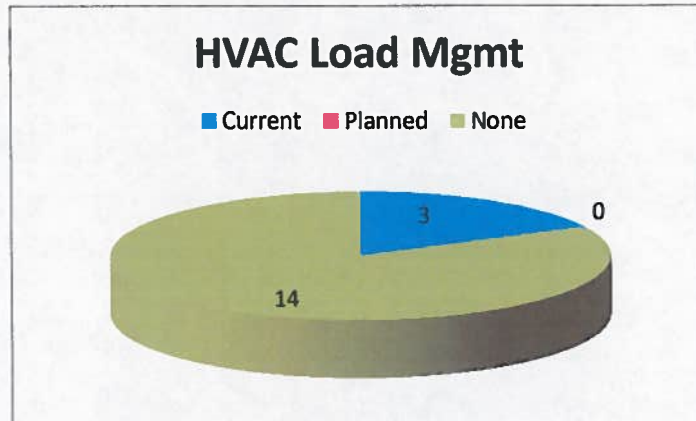
Seven cooperatives have systems in place to directly control irrigation loads during peak periods.



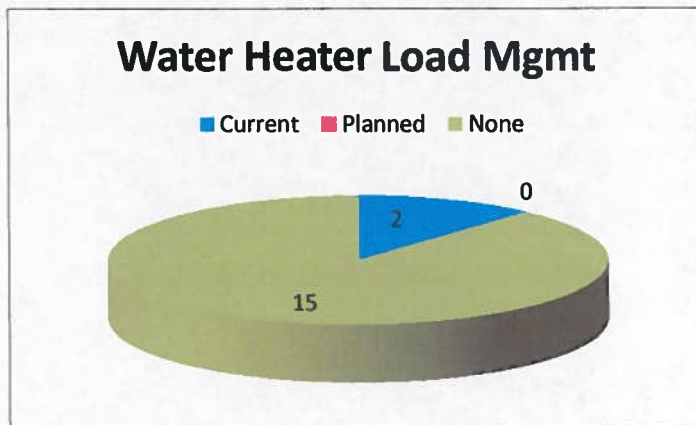
Other Load Management

Other types of direct load management systems include water heater and HVAC control during peak periods. Again, participants in these programs receive a reduced rate in exchange for their participation.

Three cooperatives have implemented direct control of HVAC systems.



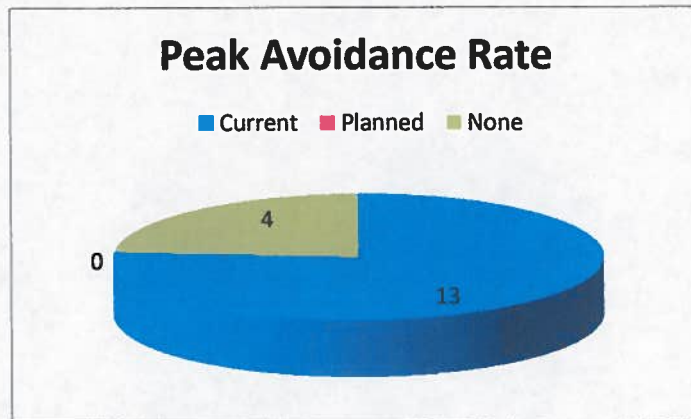
Two cooperatives have direct control of water heaters in place.



Peak Avoidance Rate

To further minimize their contribution to AECC's peak demand, some cooperatives have implemented "peak avoidance" rates for C&I members, which provide strong incentives for voluntarily reduction of demand during AECC's peak periods. AECC estimates that these programs account for a reduction in firm peak demand of approximately 65 MW.

Thirteen cooperatives currently have such rates in place.



This represents an increase of two cooperatives reporting peak avoidance rates over the 2010 survey.

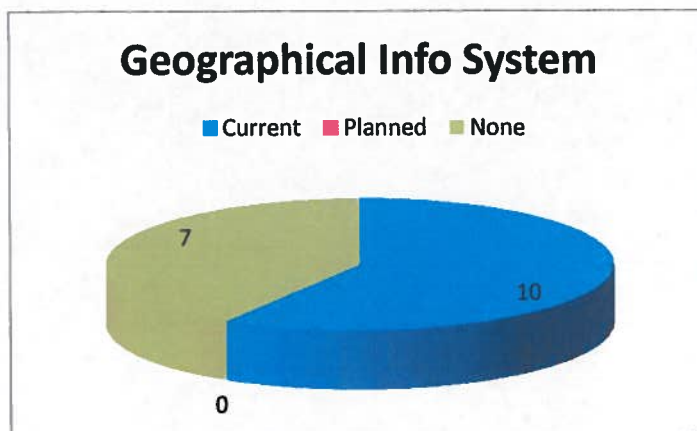
OTHER AUTOMATION INITIATIVES

These initiatives, while not specifically related to the Smart Grid, provide the Arkansas' electric cooperatives with operating efficiencies, which translate into more efficient planning, quicker restoration of power outages and cost savings.

Geographical Information Systems

A Geographic Information System (GIS), sometimes known as a Geospatial Information System, is a computerized system for capturing, storing, analyzing, managing and presenting data and associated attributes which are geographically-referenced. Cooperatives use GIS to manage their field assets (lines, poles, transformers, substations, regulators, etc.) in conjunction with system maps.

Ten cooperatives have GIS in place.

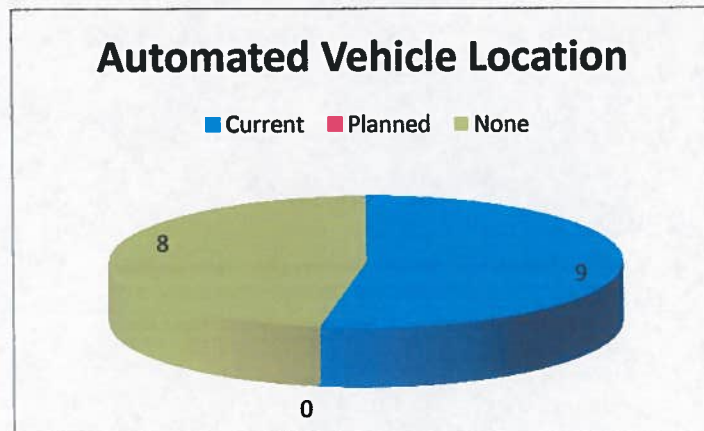


This represents an increase of two cooperatives reporting GIS implementation over the 2010 survey.

Automated Vehicle Location

Automated vehicle location (AVL) is a Global Positioning System-based system that provides the location of cooperative service vehicles in real-time. Knowing the location of each vehicle allows those vehicles to be dispatched in a more efficient fashion, saving time, man-hours and fuel, while responding to the needs of cooperative members.

Nine cooperatives have AVL deployed.

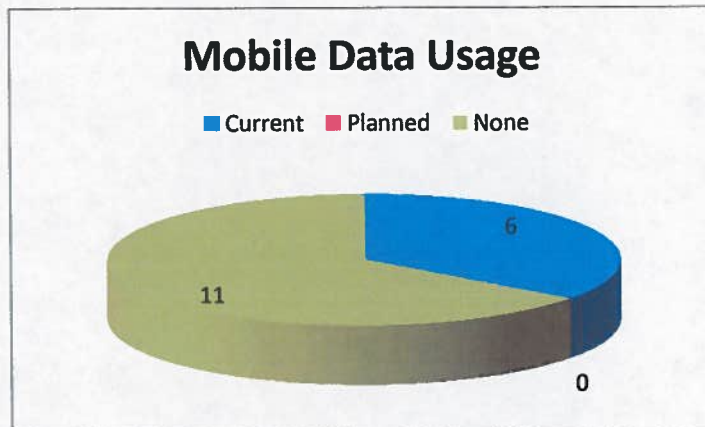


This represents an increase of two cooperatives over the seven cooperatives reporting AVL implementations in the 2010 survey.

Mobile Data/Laptops in Service Vehicles

Cooperatives have begun to deploy computerized systems that can be accessed remotely from computers in service vehicles. These systems provide field crews with the ability to access work orders and other pertinent data to assist in performing maintenance and restoration efforts.

Six cooperatives have deployed mobile computing to some extent.



One additional cooperative has added this functionality since the 2010 survey.

Broadband Over Powerline

Also known as power line carrier (PLC) technology, broadband over powerline (BPL) allows high-speed data transmission over medium-voltage power lines. While there has been much discussion of BPL as a method for delivering broadband access to rural areas and for monitoring of electric distribution systems, the technology is still in developmental stages and the current economics of such systems are not feasible in sparsely populated areas, such as those served by electric cooperatives.

At this time, no member systems within the Electric Cooperatives of Arkansas have implemented or are planning for BPL (as was the case in previous reports, as well). However, the infrastructure required for power system monitoring and two-way communication with the consumer will be deployed as AMI (rather than AMR) systems are deployed in the future.

APPENDIX A - SUMMARY OF AUTOMATION INITIATIVES

COOPERATIVE	Single Phase Meters	Automated Meter Reading - Single Phase	Number of AMR Meters - Single Phase	Single Phase AMR Vendor	Remote Disconnect	Number with Remote Disconnect	Prepaid Metering	Number of Prepaid Meters	Poly-phase Meters	Automated Meter Reading - Poly-Phase	Number of AMR Meters - Three Phase	Poly-phase AMR Vendor	Time of Use/Hourly Reads - Residential	Time of Use/Hourly Reads - C&I	Voltage Monitoring	# of Locations with Voltage Monitoring	Outage Verification	Blink Counts
Arkansas Valley Electric Cooperative	55,638	C	55,288	Aclara	C	1,372	C	26	1,039	C	1,039	Aclara	N	N	C	55,288	C	C
Ashley-Chicot Electric Cooperative	5,001	N	0		N	0	N	0	639	N	0		N	N	N	0	N	N
C&L Electric Cooperative	20,910	C	20,910	Aclara - TWACS	N	0	N	0	870	C	867	Aclara - TWACS	N	N	C	0	N	C
Carroll Electric Cooperative	85,780	C	29,511	Aclara	P	0	N	0	1,586	C	162	Aclara	N	N	C	0	N	C
Clay County Electric Cooperative	12,000	C	12,000	Aclara	C	550	N	0	755	C	738	Aclara	N	N	C	0	N	C
Craighead Electric Cooperative	26,201	C	26,201	L&G	C	2,064	N	0	801	C	801	L&G	N	N	C	57	C	C
Farmers Electric Cooperative	4,400	P	0	Cannon	P	0	N	0	1,040	N	0		N	N	P	0	P	P
First Electric Cooperative	80,731	C	80,731	Aclara - TWACS	C	2,712	N	0	5,786	C	5,786	Aclara - TWACS	N	N	C	0	C	C
Mississippi County Electric Cooperative	3,454	C	2,834	Aclara	N	0	N	0	1,074	C	302	Aclara	N	N	C	3,135	C	C
North Arkansas Electric Cooperative	35,380	C	35,380	Aclara	C	501	N	0	450	C	448	Aclara	N	N	C	0	C	C
Ouachita Electric Cooperative	8,649	C	8,575	TWACS	C	170	C	50	863	P	0	TWACS	C	N	N	0	N	N
Ozark Electric Cooperative	66,829	C	66,829	Landis + Gyr	C	1,802	N	0	1,409	C	1,409	Landis + Gyr	P	N	N	0	C	C
Pettit Jean Electric Cooperative	19,225	C	2,600	Aclara	N	0	N	0	500	P	0	Aclara	N	N	P	12,175	P	C
Rich Mountain Electric Cooperative	8,563	N	0		N	0	N	0	951	N	0		N	N	C	0	N	N
South Central Arkansas Electric Cooperative	9,954	C	9,951	Aclara - TWACS	C	355	P	0	67	C	67	Aclara - TWACS	N	N	C	0	C	C
Southwest Arkansas Electric Cooperative	26,384	C	1,400	Tantulus	C	50	N	0	2,600	C	50	Tantulus	N	N	C	1,400	C	C
Woodruff Electric Cooperative	13,330	C	13,330	Landis + Gyr	C	13,330	N	0	5,400	C	5,400	Landis + Gyr	C	N	C	14,000	C	C
Current	482,469	14	365,580		10	22,906	2	116	25,830	12	17,069		3	3	6	86,055	11	13
Planned		1			2	1	1		2	2			1	2	2		2	1
None		2			5	14	3		3	3			13	14	9		4	3
Total Current & Planned	482,469	15	365,580		12	3	3	25,830	14	17,069			4	3	8		13	14
Current		82%			59%	12%			71%				18%	18%	35%		65%	76%
Planned		6%			12%	6%			12%				6%	0%	12%		12%	6%
None		12%			29%	82%			18%				76%	82%	53%		24%	18%
With AMR		75.8 %							66.1 %				All Meters				75.3 %	
Without AMR		24.2 %							33.9 %								24.7 %	

COOPERATIVE	Irrigation Load Management in Use	HVAC Load Mgmt in Use	HVAC	HVAC Load Mgmt in Use	Water Heater	Water Heater Load Mgmt in Use	Water Heater	Water Heater Load Mgmt in Use	Peak Avoidance Rate	Time of use rates	Broadband-over-Powerline (BPL)	Communications with Substations	Communications Link to Members	Communications Services for Members
Arkansas Valley Electric Cooperative	0	0	0	0	0	0	0	0	N	N	N	N	N	N
Ashley-Chicot Electric Cooperative	0	0	0	0	0	0	0	0	N	N	N	N	N	N
C&L Electric Cooperative	66	Y	0	0	0	0	0	0	Y	N	N	N	N	N
Carroll Electric Cooperative	0	N	0	0	0	0	0	0	N	N	N	N	N	N
Clay County Electric Cooperative	600	Y	0	0	0	0	0	0	Y	N	N	N	N	N
Craighead Electric Cooperative	1,055	Y	0	0	0	0	0	0	Y	N	N	N	N	N
Farmers Electric Cooperative	176	Y	0	0	0	0	0	0	Y	N	N	N	N	N
First Electric Cooperative	1,000	Y	4,432	3,089	Y	Y	Y	Y	Y	N	N	N	N	N
Mississippi County Electric Cooperative	536	Y	0	0	0	0	0	0	Y	N	N	N	N	N
North Arkansas Electric Cooperative	0	N	7,400	11,100	Y	Y	Y	Y	Y	N	N	N	N	N
Ouachita Electric Cooperative	0	N	0	0	0	0	0	0	N	N	N	N	N	N
Ozarks Electric Cooperative	0	N	0	0	0	0	0	0	N	N	N	N	N	N
Petit Jean Electric Cooperative	0	N	0	0	0	0	0	0	N	N	N	N	N	N
Rich Mountain Electric Cooperative	0	N	0	0	0	0	0	0	N	N	N	N	N	N
South Central Arkansas Electric Cooperative	0	N	0	0	0	0	0	0	N	N	N	N	N	N
Southwest Arkansas Electric Cooperative	0	N	0	0	0	0	0	0	N	N	N	N	N	N
Woodruff Electric Cooperative	5,000	Y	711	0	0	0	0	0	Y	N	N	N	N	N
Current	8,433	7	12,543	3	14,189	2	8	13	1	17	2	17	2	2
Planned														
None														
Total Current & Planned	8433	7	12543	3	14189	2	8	13	1	17	0	17	3	3
Current														
Planned														
None														
	41%	18%	12%	47%	76%	6%	0%	0%	0%	100%	0%	100%	0%	12%
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%
	59%	82%	88%	53%	24%	94%	100%	0%	100%	0%	100%	0%	82%	82%

COOPERATIVE	Geographical Information System		Automated Vehicle Location		Vendors/System Name		Number of Trucks Equipped		Mobile Datalaptops in Trucks		Vendors/System Name		Number of Trucks Equipped		SCADA		Vendors/System Name		Number of Substations Served		Capacitor Control		
	Y	N	Y	N	DataVoice	Dell Toughbooks	Y	N	Dell Toughbooks	Y	N	Survallent	Y	N	Survallent	Y	N	Survallent	Y	N	Y	N	
Arkansas Valley Electric Cooperative	Y		Y																				
Ashley-Chicot Electric Cooperative	N		Y		Navtrak																		
C&L Electric Cooperative	N		Y		Motorola / Street Trek																		
Carroll Electric Cooperative	Y		Y																				
Clay County Electric Cooperative	Y		N																				
Craighead Electric Cooperative	Y		Y		AirLink																		
Farmers Electric Cooperative	N		N																				
First Electric Cooperative	Y		Y		Clewest																		
Mississippi County Electric Cooperative	N		N																				
North Arkansas Electric Cooperative	Y		Y		Clewest																		
Ouachita Electric Cooperative	Y		Y		GeoNav																		
Ozarks Electric Cooperative	Y		Y		DataVoice																		
Petit Jean Electric Cooperative	N		N																				
Rich Mountain Electric Cooperative	N		N																				
South Central Arkansas Electric Cooperative	N		N																				
Southwest Arkansas Electric Cooperative	Y		N																				
Woodruff Electric Cooperative	Y		Y		Kenwood																		
Current	10		9																				
Planned	7		8																				
None																							
Total Current & Planned	10		9		468	6	11	6	167	7	7	10	7	10	7	7	10	7	7	41%	0%	59%	
Current	59%		53%																		41%	0%	59%
Planned	0%		0%																		0%	0%	59%
None	41%		47%																		59%	59%	

Attachment B

Craighead Electric Cooperative Corporation

Docket No. 08-052-RP



Craighead Electric Cooperative Corporation

Your Touchstone Energy® Cooperative



P. O. Box 7503

Jonesboro, AR 72403

(800)794-5012, www.craigheadelectric.coop

2011 Energy Efficiency and Conservation Efforts

Cooperative Philosophy on the Efficient Use of Electricity

Craighead Electric Cooperative has always tried to do what is in the best interest of the member, which includes promoting energy efficiency when possible. The co-op's initial focus for its energy efficiency efforts was on helping the individual member obtain direct savings in electrical usage by installing energy efficient measures that would have an immediate impact on the monthly bill. Because Craighead Electric is a cooperative with the mission of benefitting its members, in contrast to the detached stockholders, energy efficient promotions that cut kilowatt-hour sales benefit the member directly by saving them money.

A secondary benefit of Craighead Electric promoting energy efficiency is the avoidance or delay of new power plant construction. This also results in a savings to the member-consumer, but has a long-term benefit in the form of holding down rates that would pay for the capital investment required for a new power plant.

Delaying or avoiding capital investment in new power plants can also be achieved by shifting electricity consumption to off-peak periods. Craighead Electric has been very successful in this area with its irrigation load control program and its incentive rates for large industrials. These programs allow for much more efficient allocation of generation assets, thus delaying rate increases that usually accompany power plant construction.

Craighead Electric offers a variety of energy efficiency related programs, and services to its Members. Craighead Electric's programs and services are included in this report.

- Member Education
- Programs & Services
- Load Management Programs
- Continuing Education for Employees
- Estimated Deemed Savings
- Energy Efficiency Expenses

Member Education

Arkansas Living Magazine

The *Arkansas Living* magazine is mailed to each cooperative member each month. Approximately 30% of the available space for 2011 was dedicated to energy efficiency education. Craighead Electric's cost for this 30% was \$28,322.00.

Newspaper Advertisement

The newspaper ad space bought by CECC in 2011 was directed toward energy efficiency education amounted to \$1235.00.

Radio Advertisement

Craighead Electric pays directly for radio ads to relay a variety of messages related to the co-op. CECC sponsors the "Home Remedies Radio Show" host by Doug Rye and advertising for the Doug Rye Seminars. In 2011, approximately 100% of the ads were directed towards energy efficiency education for a total of \$4695.00.

Television Advertisement

Craighead Electric pays directly for TV ads to relay a variety of messages related to the co-op. In 2011, approximately 100% of those ads were directed toward energy efficiency education for a total of \$6697.00. The "ToGetherWeSave" ads were used. These ads were produced through Touchstone Energy Cooperatives. The Touchstone Energy Cooperatives brand represents a nationwide alliance made up of more than 700 local, consumer-owned electric cooperatives in 46 states. The ads ran throughout the year and a link on KAIT TV8's website directs anyone to our website for information about energy efficiency.

During peak usage periods during the summer an "Energy Alert" light bulb icon will appear on the TV screen along with a ticker scrolling to inform members to curtail usage of non-essential appliances. This helps to reduce the summer peak demand. This is at no cost to the cooperative; it is a public service announcement through the television station.

Member Newsletter

The member newsletter, "*Hot Lines*", is mailed to each cooperative member bi-monthly. Approximately 25% of the available space for 2011 was dedicated to energy efficiency education. Craighead Electric's cost for this 25% was \$1287.00.

Bill Message

Each month an energy efficient tip of the month is added to the message block on each member's electric bill.

Energy Efficiency Home Makeover

We received 110 applications for the EE Home Makeover. Thirty four (34) e-mails were sent to homes owners with homes that were built in 1980 or less. The e-mail informed them of a free energy audit and included energy efficient information. We received a total of one (1) response from the e-mail one (1) energy audit was performed on that home. (These costs are included in the Home Energy Audit section). The labor and transportation cost in choosing a winner and promoting live on local radio stations was estimated at \$796.00.

Fair & Expo Educational booths

Craighead Electric participates annually in several expos and fairs in the communities we serve. At these events we hand out information about CECC and energy efficient information and recommendations. These are a few that we participated in 2011: Lawrence County Chamber of Commerce Business Expo, and Northeast Arkansas District Fair. Several thousand individuals visited the booths throughout the events. Cost for the booth rental space was approximately \$400.00. The labor costs were estimated to be \$1275.00

Doug Rye Energy Efficiency Seminars & Model Home

CECC sponsored six (6) Doug Rye Energy Efficient Seminars and one (1) model home open house. These seminars are free to the public and are held in the evenings and mornings. Over nine hundred twenty (920) home owners, builders, contractors, and students attended the seminars and model home open house in 2011. Estimated costs in labor and material is \$2718.00 (Doug Rye is contracted through Arkansas Electric to conduct these seminars.)

Website

CECC website, www.craigheadelectric.coop, is promoted using all forms of communications. The website had over 19,356 visits and over 76,394 pageviews from April to December 2011. Approximately 30% of the CECC website was aimed at energy efficiency in 2011 for a total of \$5075.00. Information available on the website is: EE tips, CFL savings calculator, water heater savings tips, energy savings home tour, and much more. April of 2011 we introduced a new website, which we maintain and control.

In 2012 there will be new energy efficient applications developed by Apogee. The leading provider of online solutions, they provide service to electric companies all over the United States.

Presentations

Energy Efficient Presentations are made available to civic clubs, organizations and businesses. In 2011 approximately forty (40) individuals at CRDC (Crowley's Ridge Development Council) attended an energy efficient presentation on, "Create a More Energy Efficient Life Style". And one (1) presentation about how to build a "Doug Rye" Home was presented to the Jonesboro Rotary Club. Approximately fifteen (15) attended. Total estimated cost of labor and material for presentation was \$232.00

Educational Brochures & Materials

Brochures and information on energy efficiency are available to the public in all Craighead Electric offices. Examples of the items are: Air Source Heat Pumps, Geothermal Heat Pump, Mobile Home Efficiency, Energy Efficient Tips, Appliance Usage Sheet, CFL Lighting, 101 Low Cost No Cost Saving Measures, and Home Energy Savings Guide. Estimated costs of postage and printing of new energy audit forms and new Touchstone Energy brochures is \$149.00.

This year to assist members in making their homes more energy efficient and to further educate them, each energy audit and seminar participant received a packet of Draft Stoppers and a Touchstone Energy Magnet Thermometer. The draft stoppers can be installed on their electrical plugs and switches to reduce air infiltration. Also, attached to the packet was a list of energy efficient tips and recommendations. The cost of the draft stoppers were \$419.00.

Programs & Services

Home Visits to Resolve High Bill Complaints/ Energy Audits or Recommendations

No less than 70 visits were made in 2011 to resolve high bill complaints and/or conduct energy audits or give advice for saving energy to members in the field. Total costs of labor and mileage were \$9548.00. Recommendations were also made for improvements that would provide an estimated \$31,061.00 in annual deemed savings, if the recommendations were followed. (see deemed Savings)

Home Infrared Thermography Assessment

Available on every energy audit is an infrared thermograph camera assessment. The infrared camera detects temperature differences. It will show the homeowner where they may have air leaks, and/or insulation deficiencies. This will give the member a visual inspection of their home on where they may have problems with the thermal efficiencies of their home.

Home Heating and Cooling Load Calculations

Seven (7) heating and cooling load calculations were performed from the floor plans of members, that were either starting to build or the home was under-construction. The total cost associated with this was \$1005.00.

Commercial Energy Audits

One (1) commercial energy audit was performed this year by CECC personnel with approximately \$294.00 in labor and transportation costs.

Energy Efficient Arkansas

Arkansas Electric Cooperative Corporation (AECC) contributed \$12,242.00 to the Energy Efficient Arkansas on behalf of Craighead Electric Cooperative.

Load Management Programs

Irrigation Load Control Program

Craighead Electric has 1104 irrigation and 105 fish pond accounts, of which 292 irrigation and 86 fish pond accounts participate in the load control program. Those who participate allow the cooperative to install a switch on their pumps that can be turned off by CECC personnel, when AECC is approaching a monthly demand peak. The savings from this program varies from year to year depending on several factors including weather and farming practices. In 2011 amount credited directly back to the irrigation and fish pond users were \$111,739.00. Approximately \$43,321.00 was spent on load control equipment and costs related to installation and maintenance. Total saving to the Cooperative with an average load reduction of 10 megawatts would be approximately \$896,140.00

Optional Large Industrial Rate

Large industrial customers have the option of choosing a rate on which they exercise their own load shedding/peak avoiding measures in order to decrease their contribution to the peak. They accomplish this by installing their own generation or by shifting their production to a different schedule, or by a combination of the two. Total savings benefiting the customer amounted to approximately \$67,887.00 and CECC had approximately 1281 average KW reduced in demand with a savings of \$66,730.00 in 2011 for the cooperative.

Continuing Education for Employees

Employee Continuing Education Programs

Listed below are the courses and conferences that were attended by CECC personnel to continue to learn new and innovative ways to help our member's make their homes more energy efficient. Total estimated costs associated with the classes were \$3443.00

2011 Connect Conference (National) – EE Seminars attended

2011 Electric Cooperatives of Arkansas Spring Conference (State)

2011 Tri-State Electric Cooperatives Conference (Regional)

Craighead Electric Cooperative

Deemed Savings Estimates

Based on the Residential Deemed Savings, Installation & Efficiency Standard
By Frontier Associates LLC

2011

49 Energy Audits performed

Component	Deemed Savings	
	Estimated Kwh Saved	Estimated Kw Demand Saved
AC or Heat Pump Tune Up	20,720	11.1
AC Replacement	10,543	5.77
Heat Pump/Electric Furnace Replacement	42,036	7.74
Window AC Replacement	557	0.472
Ceiling Insulation	219,338	13.879
Wall Insulation		
Floor Insulation	35,025	Negligible
Windows	13,406	4.64
Duct Work	18,036	67.8908
Water Heater Replacement	Negligible	Negligible
Water Heater Jacket	2,889	0.2655
Water Heater Pipe Insulation	1,892	0.588
Total Possible Savings with Improvements	364,441	112.3453

Estimated Deemed Savings \$ 30,077.33 \$ 984.14
 \$0.08253 / kwh (residential rate)
 \$8.76 per Kw (cost per Kw on power bill)

Total Possible Deemed Savings \$ 31,061.48

Craighead Electric Cooperative Corporation
Energy Efficiency Expenditures
2011

EE Related Programs	Category	Labor Costs	Transportation Costs	Material/Other Costs	Member Bill Credit	Total Expense	Avoided Kw Demand Costs*	Total
Education	Rural Arkansas Advertising			\$ 28,322.00		\$ 28,322.00	\$	\$ 28,322.00
	Newspaper			\$ 1,235.00		\$ 1,235.00	\$	\$ 1,235.00
	Radio			\$ 4,695.00		\$ 4,695.00	\$	\$ 4,695.00
	Television			\$ 6,697.00		\$ 6,697.00	\$	\$ 6,697.00
	Newsletter	\$ 727.00	\$ 69.00	\$ 1,287.00		\$ 1,287.00	\$	\$ 1,287.00
	EE Home Makeover	\$ 1,275.00		\$ 400.00		\$ 1,675.00	\$	\$ 1,675.00
	Fairs/Expos	\$ 1,868.00	\$ 130.00	\$ 700.00		\$ 2,718.00	\$	\$ 2,718.00
	Seminars/Model Home Website	\$ 1,775.00		\$ 3,300.00		\$ 5,075.00	\$	\$ 5,075.00
	Presentations	\$ 207.00	\$ 25.00			\$ 232.00	\$	\$ 232.00
	Materials/Brochures			\$ 568.00		\$ 568.00	\$	\$ 568.00
Programs/Services	Energy Audits/High Bills Htg & Ctg Load Calculations	\$ 8,212.00	\$ 1,336.00			\$ 9,548.00	\$	\$ 9,548.00
	Commercial Energy Audit	\$ 937.00	\$ 68.00			\$ 1,005.00	\$	\$ 1,005.00
	Energy Efficient Arkansas Contribution	\$ 247.00	\$ 47.00			\$ 294.00	\$	\$ 294.00
				\$ 12,242.00		\$ 12,242.00	\$	\$ 12,242.00
Load Management	Irrigation Load Control	\$ 38,150.00	\$ 4,548.00	\$ 623.00	\$ 111,739.00	\$ 155,060.00	\$ (1,051,200.00)	\$ (896,140.00)
	Optional Large Industrial Rate				**	\$ 67,887.00	\$ (134,617.00)	\$ (66,730.00)
Continuing Education Programs for Employees		\$ 1,776.00	\$ 1,667.00			\$ 3,443.00	\$	\$ 3,443.00
		\$ 55,194.00	\$ 7,890.00	\$ 60,069.00	\$ 111,739.00	\$ 302,779.00	\$ (1,185,817.00)	\$ (883,038.00)

* Based on the average highest peak KW demand for the 4 summer months
** Estimated Savings to the Industrial Account, no billing credit.

These figures do not include benefits from energy efficiency practices that may have been the result of CECC's educational efforts, and of which there is no record of such activity.

The above also does not include the costs of efforts sponsored by AECC, of which Craighead Electric is a participating member. Likewise, the portion of savings benefiting AECC that were not allocated back to CECC in the form of lower wholesale power costs (i.e.: delay or avoidance of generating plant construction), also are not included in this report.

First Electric Cooperative Corporation

Docket No. 08-054-RP

**First Electric Cooperative Corporation
Jacksonville, Arkansas**

2011 Energy Efficiency Report

Introduction

Since its incorporation in 1937, First Electric Cooperative Corporation (FECC) has been dedicated to providing safe, reliable and affordable electricity to its Members. FECC serves more than 88,000 Member accounts throughout parts of 17 counties in central and southeast Arkansas, operating five full service offices in Benton, Heber Springs, Jacksonville, Perryville and Stuttgart.

FECC is an innovative leader in Arkansas, offering a variety of energy efficiency related programs, products and services to its Members. FECC's energy efficiency activities include three major components, which are described in this report.

- Demand Response Programs
- Education
- Products and Services

**Energy Efficiency
Demand Response Programs**

- **Load Management**
 - FECC utilizes a load management system to lower its summer peak demand. Load management devices are installed on approximately 6,416 residential electric water heaters and air conditioners, as well as 859 electric irrigation pumps. FECC Members receive a credit on their July through October bills for participating in the program. In 2011, FECC shed approximately 16 megawatts (Mw) from its peak demand with water heater, air conditioning and irrigation load management devices. Approximately \$1,024,592 in bill credits was issued to the participating Members. Net avoided kW demand costs were \$981,526. See Attachment B for more information.

- **Tariffs**
 - To assist FECC commercial Members, two interruptible credit tariffs are offered. Rate 14 is a Member managed tariff and Rate 15 is a FECC managed tariff. During 2011, nine commercial Members utilized these rates, allowing FECC to shed an additional 5 Mw. Approximately \$228,280 in bill credits was issued to the participating Members. Net avoided kW demand costs were \$234,248. See Attachment B for more information.

Energy Efficiency Education

- **Advertising**
 - Newspaper advertising included Marathon water heaters, home improvement loans, and Doug Rye energy seminars and totaled \$1,266. Radio advertising included sponsorship of Doug Rye's "Home Remedies" radio program and totaled \$7,214.
- **Bill Inserts**
 - FECC utilizes inserts with its monthly bills, highlighting various programs and services. The June 2011 bill insert promoted summer energy saving tips. The August 2011 bill insert promoted Marathon water heaters and home improvement loans. The September 2011 bill insert informed members of the energy "vampires" in their homes. The October 2011 bill insert promoted Energy Efficiency month. Printing costs of these inserts totaled \$5,338.
- **Brochures**
 - FECC maintains a variety of brochures concerning energy efficiency, which are provided at all five FECC offices, energy audits, high bill complaints, event booths, etc. The brochures include Air Source Heat Pumps, Building Guidelines for Energy Efficiency, Compact Fluorescent Lamps, Doug Rye Home Remedies, Geothermal Heat Pumps, Manufactured Housing Energy Efficiency and Marathon Water Heaters. Printing costs totaled \$951.
- **Energy Efficiency Mini-Makeover Contest**
 - FECC conducted its third annual Energy Efficiency Mini-Makeover contest in 2011, in conjunction with the Energy Efficiency Makeover contest sponsored by the Electric Cooperatives of Arkansas. FECC chose four of its Members to receive mini-makeovers. The purpose of the project was to demonstrate the energy efficiency improvements that can be achieved with a modest investment. The cost of each of the four home improvement projects ranged from \$4,200 to \$5,000. Each of the winners received a diagnostic energy audit and improvements, which included items such as cellulose insulation in the attic, foam insulation in the crawl space, a vapor barrier, heating and cooling system servicing, duct system repair and sealing, a programmable thermostat, a Marathon electric water heater, CFLs, and caulking and weather-stripping throughout the home. The total project cost was \$18,394.
- **Energy Seminars**
 - Utilizing the services of Doug Rye, an energy efficiency expert and radio show host, FECC sponsored two energy seminars in 2011, one of which was cancelled due to weather. The free seminars are available to the general public and emphasize the proper energy efficient techniques to build or remodel a home.

Approximately 14 people attended. Seminar costs are included in other education categories.

Energy Efficiency

Education - continued

- **Model Energy Home**

In partnership with Doug Rye, Arkansas Electric Cooperative Corporation (AECC) and an area contractor, FECC sponsors the construction of a Model Energy Home. The homes feature modern energy efficient thermal and mechanical components and a guaranteed heating and cooling cost. Open house events are held to educate FECC Members and general public on proper energy efficient building components. FECC did not sponsor a model energy home project in 2011.
- **Presentations**
 - FECC provides presentations to groups on energy efficiency upon request. These presentations are customized to fit the request. During 2011, FECC made three energy efficiency presentations with approximately 310 people in attendance. Presentation costs are included in other labor categories.
- **Arkansas Living Magazine**
 - Each FECC Member receives a monthly copy of *Arkansas Living* magazine. The center-page information is specific to FECC Members. During 2011, energy efficiency articles included; a Doug Rye seminar, energy efficiency makeover contest, Energy Star, heat pump loans, heat pump maintenance, energy “vampires”, changing air filters, Marathon water heater and October being energy awareness month. Estimated costs for energy efficiency articles in *Arkansas Living* totaled \$62,000.
- **Website**
 - FECC’s website, www.firstelectric.coop, is promoted heavily using all means available. As a result, the website had more than 175,540 user sessions and more than 2.5 million hits in 2011. The website contains information on all of FECC’s energy efficiency programs, products and services.
 - During 2011, FECC contracted with Apogee Interactive to include a Home Energy Calculator, Appliance Energy Use Calculator, CFL Evaluator, and Big Screen TV Evaluator on our website. These website pages allow the FECC Member and public easily to calculate their potential energy savings based on thermal and mechanical improvements to their home, and change of energy usage habits. The 2011 Apogee fee was \$2,700.

Energy Efficiency Products and Services

- **Compact Fluorescent Lamps (CFL)**
 - FECC promotes the use of and sells CFL's to its Members. In 2011, FECC sold approximately 95 CFL's. In addition, CFL's were donated to FECC Members through energy audits and high bill investigations; and to the general public through public relations activities.

- **Diagnostic Energy Audits/Energy Audits**
 - FECC began offering a residential Diagnostic Energy Audit service in October 2009. This enhanced energy audit utilizes a blower door and infrared camera technologies to identify areas of air leakage and thermal deficiencies. A \$100 fee is charged for the service; however, if the Member makes the recommended energy efficiency improvements within six months of the audit, the \$100 fee is reimbursed. FECC also promotes and offers residential walk-through energy audits to its Members. The audits are free and provide an overall analysis and recommendation for the Member's residence. A detailed heating and cooling equipment operating cost analysis can be provided as well. FECC conducted 263 DEA/EA in 2011. See Attachment A for detailed findings.

- **Heating and Cooling Load Calculation and Analysis**
 - To insure proper HVAC sizing and operating efficiency, FECC offers residential heating and cooling load calculations and operating cost analysis to its Members. In 2011, 14 load calculations were performed.

- **Heat Pump Loans**
 - FECC promotes and offers financing for the installation of electric heat pump systems. In 2011, 11 loans totaling \$83,310 were approved. Three loan applications were denied or canceled. As part of the loan qualifying process, FECC conducts an energy audit, heating and cooling load calculation and analysis on the Member's residence.

**Energy Efficiency
Product and Services - continued**

- **High Bill Investigations**
 - FECC offers high bill investigations as a service to its Members. In 2011, 118 high bill investigations were conducted at Member residences or by telephone. In both scenarios, the Member is advised of ways to lower their electric usage using mechanical or thermal improvements and/or a change in energy usage habits. See Attachment A for detailed findings. Using daily automated meter reading reports, FECC proactively contacts those residential Members whose kWh usage is extremely high. This service allows FECC and the Member to quickly identify a faulty or misused appliance.

- **Marathon Water Heaters**
 - FECC promotes the purchase and use of Marathon electric water heaters. FECC stocks and sells various size units at each of its five district offices. The Marathon has up to a 94% Energy Factor, providing a much lower operating cost than most water heaters on the market. In 2011, FECC sold 302 Marathon water heaters to FECC Members and the general public.

2011 Energy Audit and Deemed Savings Report

(For energy audits only)



February, 2012

OVERVIEW

During 2011, First Electric Cooperative performed energy audits and/or high bill complaint analysis on the homes of at least 263 residential members, compared with 387 homes in 2010, and 225 homes in 2009. The audit procedure includes conducting an on-site inventory of home and energy use characteristics, investigating high energy usage, analyzing efficiency options, and providing recommendations for efficiency improvements.

AUDIT RECOMMENDATIONS

Recommendations for energy use improvements are divided into eight general categories. In total for 2011, there were 463 specific energy efficiency audit recommendations given to members, broken down as follows (note that most homes have more than one type of recommendation) –

Weatherization	97 homes (37%)	Appliances	21 homes (8%)
Insulation	69 homes (26%)	Lighting	21 homes (8%)
HVAC	62 homes (24%)	Windows/doors	12 homes (5%)
Water heating	26 homes (10%)	Miscellaneous	7 homes (3%)

DEEMED SAVINGS

Deemed savings analysis is based on data produced by Frontier Associates LLC, showing estimated kW and kWh impacts for specific efficiency improvements. Based on the analysis in the Frontier report, the following shows the estimated impacts of the 2011 efficiency improvement recommendations –

	<u>2011</u>	<u>2010</u>
Total potential kW peak demand reduction to co-op		50.0 kW
111.1 kW		
Total potential annual kWh reduction to members	496,699 kWh	777,813
kWh		
Total potential annual energy cost savings to members (@ \$0.08/kWh)	\$ 39,736	\$ 62,225
Total potential MMBTU reduction	1,694.89	2,654.13

The following shows the estimated reduction in kWh usage and kW peak demand of the audit efficiency improvement recommendations, as well as MMBTU reductions, by category –

Insulation	354,389 kWh	27.4 kW	1,209.28 MMBTU
Weatherization	75,628	7.0	258.07
HVAC	52,907	13.0	180.53
Windows/doors	8,039	1.9	27.43

Appliances	2,755	0.4	9.40
Water heating	2,288	0.2	7.81
Lighting	693	0.1	2.36

This report was developed by Inside Information® Inc., Smithville, Missouri, as part of a member database project commissioned by First Electric Cooperative, Jacksonville, Arkansas.

First Electric Cooperative Corporation
Jacksonville, Arkansas

Attachment B
2010 Energy Efficiency Expenses

Component	Category	Labor	Material / Other Costs	Member Bill Credits	Total Expenses	Avoided kW Demand Costs*	Revenue	Total
Demand Response	Load Management	\$ 20,235	\$ 2,463	\$ 1,024,592	\$ 1,047,290	\$ (2,028,816)	\$ -	\$ (981,526)
	Tariffs	\$ -	\$ -	\$ 228,280	\$ 228,280	\$ (529,279)	\$ -	\$ (300,999)
Education	Advertising	\$ -	\$ 7,214	\$ -	\$ 7,214	\$ -	\$ -	\$ 7,214
	Bill Inserts	\$ -	\$ 5,338	\$ -	\$ 5,338	\$ -	\$ -	\$ 5,338
	Brochures	\$ -	\$ 951	\$ -	\$ 951	\$ -	\$ -	\$ 951
	Energy Efficiency Mini-Makeover Contest***	\$ -	\$ 18,394	\$ -	\$ 18,394	\$ -	\$ -	\$ 18,394
	Energy Seminars	\$ -	\$ 910	\$ -	\$ 910	\$ -	\$ -	\$ 910
	Model Energy Home	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Presentations**	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Rural Arkansas Magazine	\$ -	\$ 62,000	\$ -	\$ 62,000	\$ -	\$ -	\$ 62,000
	Web site	\$ -	\$ 2,700	\$ -	\$ 2,700	\$ -	\$ -	\$ 2,700
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Products and Services	Compact Fluorescent Lamps	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (279)	\$ (279)
	Diagnostic Energy Audits***	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Energy Audits	\$ 32,175	\$ -	\$ -	\$ 32,175	\$ -	\$ -	\$ 32,175
	Heating & Cooling Load Calculations**	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Heat Pump Loans	\$ 8,930	\$ 83,310	\$ -	\$ 92,240	\$ -	\$ (11,767)	\$ 80,473
	High Bill Investigations	\$ 8,212	\$ -	\$ -	\$ 8,212	\$ -	\$ -	\$ 8,212
	Marathon Water Heaters	\$ 11,017	\$ 218,370	\$ -	\$ 229,387	\$ -	\$ (211,985)	\$ 17,402
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total		\$ 80,569	\$ 401,650	\$ 1,252,872	\$ 1,735,091	\$ (2,558,095)	\$ (224,031)	\$ (1,047,035)

* Based on the single highest peak kW demand and kW charges only.

** Program costs not specifically tracked, but included in other EE categories.

*** Program labor costs included with Energy Audit labor costs.

FIRST ELECTRIC COOPERATIVE

2011 TOTAL Energy Efficiency Measures

Frontier Deemed Savings

Assumed kW peak demand reduction per household

Assumed annual kWh reduction per household

Total potential annual deemed savings to consumers (@ \$0.08/kWh)

Total potential kW peak demand reduction to co-op

Total potential annual savings to consumers

Total MMBTU impact from measures recommended or completed/yr

Amount of co-op expenditures invested/yr

Measures recommended

	Measures recommended	Amount of co-op expenditures invested/yr	Total MMBTU impact from measures recommended or completed/yr	Total potential annual savings to consumers	Total potential kW peak demand reduction to co-op	Total potential annual deemed savings to consumers (@ \$0.08/kWh)	Assumed annual kWh reduction per household	Assumed kW peak demand reduction per household
Audits reported in 1Q-4Q, 2011 = 263 homes								
I. Lighting								
1	Install compact fluorescent bulbs	\$ -	2.36	693	0.084	\$ 55.44	33	0.004
2	Inspect recessed light fixtures	\$ -	0.00	0	0.000	\$ -		
3	Reduce operation of outdoor lights	\$ -	0.00	0	0.000	\$ -		
4	Use automatic dimmers/lighting controls	\$ -	0.00	0	0.000	\$ -		
	Total -- Lighting (8% of homes)	\$ -	2.36	693	0.084	\$ 55.44		
II. Appliances								
1	Clean refrigerator coils	\$ -	0.00	0	0.000	\$ -		
2	Adjust refrigerator thermostat settings	\$ -	0.00	0	0.000	\$ -		
3	Perform refrigerator/freezer maintenance/seal around door	\$ -	0.00	0	0.000	\$ -		
4	Eliminate or unplug second refrigerator or freezer	\$ -	0.00	0	0.000	\$ -		
5	Replace refrigerator/freezer with Energy Star model	\$ -	8.47	2,481	0.345	\$ 198.48	827	0.1150
6	Repair or replace dryer vent	\$ -	0.00	0	0.000	\$ -		
7	Use air-dry option on dishwasher	\$ -	0.00	0	0.000	\$ -		
8	Upgrade to more efficient appliances	\$ -	0.93	274	0.030	\$ 21.92	137	0.0150
9	Perform maintenance on or replace dryer	\$ -	0.00	0	0.000	\$ -	76	0.0104
	Total -- Appliances (8% of homes)	\$ -	9.40	2,755	0.375	\$ 220.40		
III. Insulation								
1	Add attic insulation	\$ -	356.86	104,580	21.870	\$ 8,366.40	2,324	0.486
2	Install insulation for floor, crawl space, trailer skirting	\$ -	596.56	174,825	0.000	\$ 13,986.00	4,725	0.000
3	Install, repair or replace vapor barrier	\$ -	0.00	0	0.000	\$ -		
4	Add or repair wall insulation	\$ -	255.87	74,984	5.544	\$ 5,998.72	2,678	0.198
5	Insulate attic access door or around attic fan	\$ -	0.00	0	0.000	\$ -		
	Total -- Insulation (26% of homes)	\$ -	1,209.28	354,389	27.414	\$ 28,351.12		
IV. Weatherization								
1	Caulk or weatherstrip around doors or windows	\$ -	115.08	33,726	3.136	\$ 2,698.08	511	0.04752
2	Seal pipes, attic fan, vents, lights, baseboard, etc.	\$ -	111.60	32,704	3.041	\$ 2,616.32	511	0.04752
3	Repair or install attic air-flow vents	\$ -	0.00	0	0.000	\$ -		
4	Close or repair fireplace damper/seal flue	\$ -	10.46	3,066	0.265	\$ 245.28	511	0.04752
5	Repair holes in ceiling or exterior wall	\$ -	8.72	2,555	0.238	\$ 204.40	511	0.04752
6	Repair leaky bathroom vent/install new exhaust fan	\$ -	12.21	3,577	0.333	\$ 286.16	511	0.04752
	Total -- Weatherization (37% of homes)	\$ -	258.07	75,628	7.033	\$ 6,050.24		
V. Windows and Doors								
1	Install new storm windows or upgrade windows	\$ -	27.43	8,039	1.930	\$ 643.10	2,010	0.4824
2	Install new insulated doors	\$ -	0.00	0	0.000	\$ -		
3	Adjust or repair broken windows or doors	\$ -	0.00	0	0.000	\$ -		
	Total -- Windows and Doors (5% of homes)	\$ -	27.43	8,039	1.930	\$ 643.10		

VI. HVAC												
1	Change furnace and A/C filter	2	\$	-	0.00	0	0.000	\$	-			
2	Repair, seal and close gaps in ductwork/return air	28	\$	-	29.05	8,512	1.044	\$	680.96	304		0.0373
4	Repair or service central air or heat pump	14	\$	-	20.73	6,076	2.940	\$	486.08	434		0.2100
5	Replace central air unit	1	\$	-	3.37	988	0.410	\$	79.04	988		0.4100
6	Replace or install new air-source heat pump	16	\$	-	115.04	33,712	7.200	\$	2,696.96	2,107		0.4500
7	Install geothermal heat pump	1	\$	-	12.35	3,619	1.414	\$	289.52	3,619		1.4140
8	Replace window A/C with high-efficiency window units	0	\$	-	0.00	0	0.000	\$	-	111		0.0950
9	Install or use ceiling fans	2	\$	-	0.00	0	0.000	\$	-			
10	Install programmable thermostat	4	\$	-	0.00	0	0.000	\$	-			
11	Adjust thermostat settings (lower winter, higher summer)	0	\$	-	0.00	0	0.000	\$	-			
12	Remove obstructions to inside HVAC units	1	\$	-	0.00	0	0.000	\$	-			
13	Remove obstructions to outside HP or CA unit airflow	1	\$	-	0.00	0	0.000	\$	-			
14	Repair/adjust backup heat strips/portable electric heaters	7	\$	-	0.00	0	0.000	\$	-			
15	Install drapes or window shades	1	\$	-	0.00	0	0.000	\$	-			
	Total -- HVAC (24% of homes)	78	\$	-	180.53	52,907	13.008	\$	4,232.56			
VII. Water Heating												
1	Turn down/add timer for water heater thermostat	0	\$	-	0.00	0	0.000	\$	-			
2	Install water heater insulation wrap/blanket	22	\$	-	5.71	1,672	0.132	\$	133.76	76		0.006
3	Repair leaks in water heater tank or pipes	0	\$	-	0.00	0	0.000	\$	-			
4	Install more efficient water heater	3	\$	-	1.80	528	0.042	\$	42.24	176		0.014
5	Service/repair/replace water heater element	2	\$	-	0.00	0	0.000	\$	-			
6	Install hot water pipe insulation	2	\$	-	0.30	88	0.028	\$	7.04	44		0.014
7	Install faucet aerators	0	\$	-	0.00	0	0.000	\$	-	140		0.012
8	Install low-flow showerheads	0	\$	-	0.00	0	0.000	\$	-	190		0.017
9	Use cold water for washing clothes	0	\$	-	0.00	0	0.000	\$	-			
	Total -- Water Heating (10% of homes)	29	\$	-	7.81	2,288	0.202	\$	183.04			
VIII. Miscellaneous												
1	Begin leveled billing	0	\$	-	0.00	0	0.000	\$	-			
2	Reduce use/add timers on pool/hot tub/garden pumps	1	\$	-	0.00	0	0.000	\$	-			
3	General conservation, unplug appliances when not in use	0	\$	-	0.00	0	0.000	\$	-			
4	Explain fuel cost adjustment	0	\$	-	0.00	0	0.000	\$	-			
5	Repair, replace, or cycle dehumidifier	1	\$	-	0.00	0	0.000	\$	-			
6	Test or check electric meter/breaker/check wiring	2	\$	-	0.00	0	0.000	\$	-			
7	Test or check water well pump	0	\$	-	0.00	0	0.000	\$	-			
8	Explain weather/usage, recommend full energy audit	3	\$	-	0.00	0	0.000	\$	-			
	Total -- Miscellaneous (3% of homes)	7	\$	-	0.00	0	0.000	\$	-			
	GRAND TOTAL	463	\$	-	1,694.89	496,699	50.0	\$	39,736			

First Electric -- 1Q-4Q 2011 energy audits and high bill complaints							
Heating type							
Heat pump	60%					75	
Electric furnace or electric resistance	10%					13	
Gas furnace	29%					36	
Wood stove	2%					2	
Baseboard/ceiling/portable electric	0%					0	
Unknown -- not listed						137	
Air conditioning type							
Heat pump	60%					70	
Central air	38%					44	
Window unit	3%					3	
Unknown -- not listed						146	
Air conditioning size							
Less than 3 tons	23%					27	
3-3.5 tons	34%					40	
4-5 tons	31%					37	
>5 tons	12%					14	
Unknown -- not listed						145	
Water heater type							
Electric	72%					51	
Gas	27%					19	
Tankless	1%					1	
Unknown -- not listed						192	
Water heater size							
Less than 40 gallons	1%					1	
40 gallons	41%					28	
50-75 gallons	35%					24	
80 or more gallons	22%					15	
Unknown -- not listed						195	

Farmers Electric Cooperative Corporation

Docket No. 08-053-RP

**Farmers Electric Cooperative Corporation
Newport, Arkansas**

2011 Energy Efficiency and Conservation Report

Farmers Electric Cooperative was incorporated on June 2, 1937 and energized the first lines on August 1, 1938. Since then, Farmers Electric has been dedicated to providing safe, reliable, and affordable electricity to its membership. In 2011, Farmers Electric served 5,103 consumers, with a large percentage from low-income to middle-income families and a large number of agricultural lands.

Load Control/Demand Response

Farmers Electric offers two rate options to irrigation customers, a controlled rate and a regular, uncontrolled rate. The difference between these two rate options is significant in both cost and availability of power to the irrigation customer. The regular, uncontrolled rate includes a cost of \$0.0788/kilowatt hour for each kWh used, plus \$15.45/kW per month demand charge. The controlled rate includes a reduced cost of \$0.0684/kilowatt hour for each kWh used, plus a lower demand charge of \$9.55/kW per month. When choosing the controlled rate, customers allow the cooperative to install a radio-controlled switch on the pump. The control will interrupt power to the irrigation pump during periods when Farmers Electric total load is contributing to a new statewide peak. The “controlled” periods can vary from a few minutes to several hours. The “controlled” periods can vary from a few days each summer to several consecutive days. Every effort is made to minimize the “controlled” periods and still not contribute to a higher peak demand. Historically, Farmers Electric has achieved 13.6% reduction in summer peak demand, which has saved our members \$429,547/year and postponed the need for 4.7 MW of new coal-fired generation. Farmers Electric had 175 irrigation accounts (approximately 33.5% of all irrigation accounts) connected on the radio-controlled rate.

Membership Education

- Each member of Farmers Electric receives a monthly issue of Rural Arkansas Magazine, which provides energy savings suggestions as well as energy efficiency tips and various other conservation topics. Each month, the Rural Arkansas Magazine designates the center-page to Farmers Electric to use in providing important information to our members such as energy and conservation education.
- Uses media advertising in local newspaper and radio station, encouraging energy efficiency. More than 1,200 energy efficiency advertisements were run on local radio station, KNBY/KOKR.
- Farmers Electric employees assist members with high bill complaints. When members have questions regarding the kWh usage on their residences, employees offer examples of ways to help conserve energy – i.e. caulking, insulation, thermostat setting, etc.

- Upon request of member, Farmers Electric will assist with and schedule energy surveys of residences and provide information on energy efficiency that will help with lowering their energy usage.
- Provides educational information at front desk free of charge to the members and others who are interested. Information available at front desk is as follows: Compact Fluorescent Lamps (CFLs), Air Source Heat Pumps, Geothermal Heat Pumps, Energy Efficiency in a Manufactured Home, and Marathon Water Heaters. Staff will consult with members, upon request, to further help with understanding of energy efficiency and conservation measures. Farmers Electric hopes to help our members make wise energy choices.
- Assist members building new construction with energy efficiency building guidelines.
- Assist and educate members and others on the Marathon Water Heaters. Staff assists with ordering information, and delivery notification. Marathon Water Heaters are available “at cost” to consumers. Nine (9) Marathon Water Heaters were sold in 2011.
- Display of geo-thermal heat pump with information available in office. Farmers Electric wants to encourage energy efficient forms of residential heating/cooling.
- Provide members and others with CFL bulbs at cost to cooperative. Display in front lobby showcasing the different CFL bulbs and options. Also provides members and others with on-site comparison of CFL bulb and a regular incandescent bulb with a wattage calculating device. To date, Farmers Electric has sold almost 256 CFL bulbs – which contribute to 20% energy savings to those in the community.
- Provide members with energy saving faucet devices, which not only reduces water usage, but also electrical pumping costs. Although not electricity conservation, Farmers Electric wants to provide alternative energy efficiency products to its membership.
- Use energy efficient night lights as a promotional tool. These night lights use only \$0.02 worth of electricity per year when left on constantly.
- New bill forms provide customers with kilowatt usage graph to encourage customers to be more aware of usage from month to month.
- Provided calendars for 2012 that offered energy efficiency tips, such as “Replace Air Filters”, “Change 3 Light Bulbs to CFLs” on specific days each month. Also includes other “Smart Energy Tips” as a header for each month. Also provides a website to find further energy efficiency tips, www.SmartEnergyTips.org; as well as other electronic/on-line media, such as Facebook, Twitter, and YouTube.

**Southwest Arkansas Electric Cooperative
Corporation**

Docket No. 08-042-RP

**Southwest Arkansas Electric Cooperative Corporation
Texarkana, Arkansas**

2011 Energy Efficiency and Conservation Report

**Submitted to the Arkansas Public Service Commission
Pursuant to Docket No. 06-004-R**

Southwest Arkansas Electric Cooperative Corporation is a non-profit, member-owned utility organized under the Arkansas Electric Cooperative Corporation Act. Since its incorporation on August 25, 1937, Southwest Arkansas Electric Cooperative remains dedicated to providing affordable and reliable electric service at valued rates to its membership while promoting and encouraging energy efficiency and energy conservation in its service area. Its service territory includes portions of Columbia, Hempstead, Howard, Lafayette, Little River, Miller, Polk and Sevier counties in southwest Arkansas; part of Bowie County in northeast Texas and McCurtain County in southeast Oklahoma.

The terrain of Southwest's service area varies considerably from low flat farmland in the south to rolling hills in the north. Land elevations range from 200 to 2000 feet above sea level. Land use within the Cooperative's service area is very diversified. The rolling hills in the north invite truck farming, plus lumber, dairy and poultry operations. In the south, the rich flat farmlands produce cotton, rice, soybeans, hay and corn. The cattle industry is also prominent throughout the service area.

The Cooperative provides service to approximately 18,437 member consumers through approximately 27,400 separately metered points of delivery, through 5,385 miles of overhead and underground distribution line, 134 miles of 69 kV transmission line and 32 substations. The total power requirements are supplied at wholesale by Arkansas Electric Cooperative Corporation, Little Rock, Arkansas, a generation and transmission cooperative that is partially owned by Southwest Arkansas Electric Cooperative.

Southwest Arkansas Electric Cooperative Membership Education

- Provides *Arkansas Living*, a monthly publication that furnishes members current news concerning national and state issues relative to the electric power industry. Also, the *Arkansas Living* magazine affords the opportunity each month to give energy efficiency and energy conservation information to members.
- Provides educational information at the front counter and upon request, free of charge, to any interested person.
- Participates in providing energy efficient electric ranges to area high school home economics classes.

- Provides billing inserts several times a year that gives information about current topics and information on energy efficiency and conservation.
- Provides free educational material to area schools that targets energy conservation and safety. Annually, Cooperative personnel visit area schools to teach both energy conservation and electrical safety. Scott Davis, Cooperative magician, presented Making Accidents Disappear public safety magic shows to 19 schools in the Southwest Arkansas Electric Cooperative service area reaching approximately 3,150 students. Making Accidents Disappear is an educational and entertaining program that teaches children the importance of electrical safety. The 40-minute school assembly program uses audience participation, comedy, stories, and magic to communicate the importance of behaving safely around electricity.
- Also, the Cooperative's print and radio advertising emphasizes important member and public safety information.
- Southwest Arkansas Electric Cooperative Corporation gave a series of safety presentations to first responder emergency personnel, firemen, state troopers, local police officers and emergency services personnel in its service area on electrical safety that included topics such as overhead power lines; what to do in the event of a downed power line on a vehicle; downed power lines in the field; power line safety; substation and transformer emergencies; and recognizing the dangers of pulling meters during fire events that may have been tampered with prior to the fire event. These presentations also emphasized electrical safety and hazard recognition for all emergency services personnel.
- Sponsors one or two area high school juniors each year for the Washington, D.C. Youth Tour. This tour combines education, history, and fun for the participants as they visit our Nation's Capitol. In addition to visiting the Capitol and learning about the National Rural Electric Cooperative program, the participants expand their knowledge of energy efficiency, energy conservation, the history of rural electrification and current issues.
- Provides directors and employees the opportunity to attend the annual ACRE Legislative Conference in Washington, D.C. to participate in legislative forums about current issues involving the electricity industry and to meet with the Arkansas Congressional Delegation.
- Sponsors seminars by Doug Rye, a consultant for the Electric Cooperatives of Arkansas, that hosts a nationally syndicated radio show that promotes energy efficiency and energy conservation. Also, Mr. Rye provides energy efficiency and energy conservation tips monthly in the *Arkansas Living* magazine.
- Provides a website, www.swrea.com, with Facebook access that includes information on energy efficiency and conservation. Also, the website includes

links to the Touchstone Energy Savers Efficient House, the Touchstone Energy Kid Zone and the U.S. Department of Energy website.

- Participates in CEO to Member Email Program, a tool specifically designed to help cooperative CEOs effectively communicate with members about issues affecting the cost of electricity. Southwest Arkansas Electric Cooperative currently has approximately 4,450 email addresses of member-consumers.
- Sponsors the Texarkana HVACR Association. The chapter consists of local heat and air conditioning contractors that meet monthly except during the summer season. The Association reviews new products and procedures and keeps their membership up-to-date on state requirements and rule changes. The Association sponsors seminars that promotes energy savings equipment such as energy efficient ceiling ducts and new insulation material and techniques.
- Provides an electrical safety training demonstration. This safety demonstration has been given to schools, rural fire departments and other emergency agencies.
- Upon request, will give assistance and advice to members for onsite residential energy surveys. A web based residential energy audit is provided at no charge through www.swrea.com.
- Provides employees trained to perform onsite residential energy audits.
- Provides information to members on the benefits of energy efficient water heaters. Marathon water heaters are offered to the membership at discounted prices.
- Customer service representatives provide energy conservation tips to members as they help with high bill inquiries.
- Provides free compact fluorescent bulbs and education material to new members as a part of the new member packet.
- Uses print and radio advertisements to promote energy efficiency and energy conservation.
- Provides an industrial power service optional rate schedule that allows industrial users to control or shed their peak kW usage in order to avoid kW coincident demand. The industrial user can accomplish this by various means including the shifting of the production schedule during the summer, installing distributed generation or a combination of the two. Presently, Southwest Arkansas Electric has two industrial consumers using this option.

Southwest Arkansas Electric Cooperative Energy Resource Conservation Loans (ERC)

- Provides information on energy efficient heat pumps and water heaters.
- Works with members on installing energy efficient heat pumps and water heaters using 5% financing through its ERC loan program. Since 1991, a total of \$5.7 million has been loaned to 1,130 members. There are currently 198 loans outstanding with a balance of \$658,001. This program has provided affordable financing to many of its members who otherwise would not have been able to afford the energy saving improvements.
- Promotes, sells and finances the energy efficient Marathon hot water heaters to members. This water heater is 97% efficient and guaranteed for life.
- As an addendum to the ERC loan program, provides financing for the purchase of small standby generators for home and commercial use. There has been \$349 thousand loaned to 433 members. There are no outstanding loans at this time.
- As an addendum to the ERC loan program, the Cooperative provides financing for energy efficient doors and windows.
- As an addendum to the ERC loan program, the Cooperative provides financing for the installation of insulation material on existing homes.

Energy Efficiency and Conservation in Association with the Electric Cooperatives of Arkansas

- Participates in an energy efficiency educational program titled “Extreme Energy Inefficient Home Makeover.” This program is designed to highlight the benefits of installing energy efficient equipment and materials in order to maximize energy conservation.
- Participates in the Arkansas Energy offices statewide Arkansas Energy Efficiency Education Program. The program is designed to utilize various media platforms to present information on energy efficiency and energy conservation. In January 2008, the Electric Cooperatives of Arkansas contributed approximately \$279,340 to the EEA program and made additional voluntary payments of \$246,784 and \$95,605 in January 2009 and 2010, respectively. In April 2011, the Electric Cooperatives of Arkansas paid \$112,463 for EEA budgeted program expenses.
- Participated in the initial Deemed Savings Report that was filed with the APSC in April 2007. The contribution to this report was approximately \$12,085. In addition, the Electric Cooperatives of Arkansas contributed \$17,307 for the 2011 Deemed Savings Report.

- Began the “Safe Electricity” program to convey information on public health, safety, environmental protection, equipment safety and conservation that utilizes radio and print media to promote safety education to the membership.
- From October 2007 through December 2007, participated in programs with the Arkansas Community Action Agencies by funding approximately \$28,500 and funded an additional amount of \$114,000 per year in 2008 and 2009 for an Electric Cooperative Weatherization Program. When ACAA develops a statewide weatherization program, the Electric Cooperatives of Arkansas will reconsider weatherization program support.
- In coordination with the statewide association, sponsored Doug Rye’s nationally syndicated radio program “Home Remedies.”
- Participates in the Arkansas Public Service Commission Energy Efficiency collaborative. In addition, the Electric Cooperatives of Arkansas participated in a collaborative discussing energy efficiency reporting for investor owned utilities. Also, the Electric Cooperatives of Arkansas participated in a series of APSC sponsored teleconferences regarding National Action Plan for Energy Efficiency (NAPEE) “best practices.”

Conclusion

Southwest Arkansas Electric is committed to its strategic vision that includes providing information and education on energy efficiency and energy conservation. The Cooperative will also provide programs and services that promote both energy efficiency and energy conservation.



C. Wayne Whitaker, President and CEO

**Arkansas Valley Electric Cooperative
Corporation**

Docket No. 08-050-RP

Arkansas Valley Electric Cooperative Cooperation

Ozark Arkansas

Energy Efficiency 2011 Report

This report is provided to the Arkansas Public Service Commission for review of Arkansas Valley Electric Cooperative Cooperation's (AVECC) energy efficiency programs, services and measurements thereof.

In 2011 AVECC continued to build upon its longstanding commitment to energy efficiency programs for members and communities served through a variety of educational and public outreach programs regarding efficient energy usage. AVECC continued to provide no-cost energy audits and consults to residential, agricultural and commercial members.

AVECC worked with various government agencies in order to provide information to the membership on programs providing tax credits, rebates, and funding for energy efficiency products, renewable energy and low income weatherization programs.

Through partnerships with Touchstone Energy Cooperative and Arkansas Electric Cooperatives Corporation, AVECC added new energy efficiency programs, services and presentations for cooperative members and general public in 2011.

Energy Efficiency Programs

- Complete Energy Audit (Blower Door / Duct Blaster and Thermographic Analysis)

AVECC has employed one full time Building Performance Institute (BPI) and Minneapolis Blower Door certified Energy Auditor since 2010. That employee also completed Level 1, Residential Energy Audit Thermographer certification in 2011. One other full time

employee completed BPI Residential Auditor training in 2011 and is scheduled to test for certification in 2012. AVECC's complete energy audit utilizes BPI practices and techniques including blower door, duct blaster and infrared testing equipment to determine heating and cooling loss in existing structures that lead to high-energy consumption. The analytical data is assembled into a report that outlines opportunities for the member to reduce energy consumption and save on utility bills. AVECC offers this as a no-cost service to all residential and small commercial members.

- **Basic Energy Audit**

The basic audit is utilized for members with time constraints that would preclude a complete audit or when a member is concerned with abnormally high usage as opposed to a comprehensive plan for home energy efficiency. This method usually involves a walkthrough of the member's property in order to locate and isolate appliances, pumps, motors or HVAC units that may be compromised and leading to high electricity consumption. Recommendations for other energy efficiency measures are made when applicable.

In both the complete and basic audit, the member is given a compact fluorescent lamp and literature that details cost and kilowatt consumption benefits of CFL lighting. Members also receive Touchstone Energy's, *101 Easy Ways to Save Energy and Money* booklet and other literature that may be applicable.

All personnel directly involved in energy efficiency programs received over 100 hours each of continuing education related to energy efficiency, audit methods, renewable resources and new related technologies. Residential energy efficiency training was also provided to customer service personnel who are not directly involved with energy efficiency programs but typically deal with member energy usage inquiries.

- **University of Arkansas - Fort Smith Solar Water Heating Program**

In early 2011 AVECC began working with the University of Arkansas – Fort Smith (UAFS), Western Arkansas Technical Center on career training programs in renewable and energy efficiency. As part of those efforts, AVECC secured a donation through Rheem Manufacturing Company of a complete SolPak solar water heating system. Market value of the entire system is estimated \$5000.00. The system will be installed at UAFS

in spring of 2012. UAFS and AVECC will use the system for demonstrative and educational purposes for students and general public.

Ex. A & A1

Touchstone Energy's' Together We Save Campaign

AVECC devoted a great deal of marketing resources toward "Together We Save" (TWS) in 2011. The web based tool is featured on the AVECC website. TWS contains more than a dozen energy-efficiency interactive web applications linked to a virtual home tour, all designed to encourage co-op members to take energy-saving actions now. Plus Touchstone Energy TV, showcasing energy-efficiency videos and the Energy Saving Forum, where cooperative members from across the nation can post their own energy saving success stories and learn more information on how they can lower their energy bill. TWS utilizes AVECC actual rates to allow members to estimate cost savings through energy efficiency measures.

AVECC utilizes several other web based energy efficiency tools and information resources on avecc.com including programs designed for lighting energy usage calculation, Energy Star information and renewable energy resource information.

Ex. B

E-Newsletter

AVECC publishes a monthly electronic newsletter that focuses on residential energy efficiency articles. Each issue is posted on the AVECC website. Arkansas Valley also utilizes a third party email management company to distribute the newsletter to members (approximately 700) who request the service.

Arkansas Living Magazine

All AVECC members receive a monthly copy of *Arkansas Living* magazine. The center-page information is specific to AVECC members. During 2011, energy efficiency articles included, energy star appliance information, energy efficiency makeover contest and low cost energy efficiency information.

Energy Efficiency Marketing / Advertising

Energy efficiency related television, radio and print advertising were expanded in 2011. AVECC also utilized these media to create a greater awareness of the Together We Save Campaign, energy audit programs and simple energy efficiency tips.

AVECC Energy Efficiency Advertising and Market Expense Report 2011

Television	Radio	Print	Internet	
	35,000	8,000	1,000	5,000
Grand Total			\$49,000.00	

Energy Efficiency Education

AVECC conducted or participated in various energy efficiency programs targeted to grades K – 12 in 2011. Energy efficiency didactic materials were also made available to numerous area schools.

AVECC continued to work with Arkansas Tech University – Ozark Campus through guest lecture series on topics relating to energy efficiency. Lectures were presented to various business classes. AVECC continued it's electric vehicle partnership with ATU – Ozark for the purpose of creating better student understanding of electric motor efficiency.

2011		
School District	School Visits	Estimated Number of Students
Alma	1	100
ATU-Ozark	2	60
Booneville	1	400
Cedarville	1	75
Clarksville	4	600
Fort Smith	1	100
Lamar	3	75
Lavaca	1	250
London	1	200
Mansfield	2	400
Oark	2	200
Ozark	2	250
Paris	3	350
Scranton	1	125

U of O	2	75
Van Buren	7	700
Westside	7	575
Total	41	4,535

Energy Efficient Marathon and GE GeoSpring Water Heaters

AVECC continued informing members of the benefits of energy efficient water heating by promotion and distribution of the two of the most efficient electric water heaters currently available. In 2011 AVECC distributed 52 Marathon and 2 GeoSpring water heaters to our membership. AVECC has zero margin of profit on these products when sold to members.

AVECC's total 2011 estimated expenditures related to energy efficiency related programs, public outreach, advertising, marketing, audits, training and materials equal \$94,000.00. 2011 total deemed savings \$630,211.17, 6,509,602 Kwh.

Ex. C

ID	Date	Audit, Meeting or Call Name	Type	City	Man Hours	Est Mileage
962	1/6/2011	Gene (Anna) Niece	Phone consultation	Van Buren	0.25	
963	1/6/2011	Oren Atchley	Phone consultation	Fort Smith	0.25	
966	1/6/2011	Sandra Lingo	Energy Audit	Hunt	3	60
967	1/12/2011	Lee Moore	Energy Audit	Waldron	3	100
968	1/13/2011	Henry (Elaine)Moore	Audit	Dover	4	100
969	1/13/2011	Linda Fitzner	Audit	Ozone	3	80
970	1/17/2011	James Reasoner	Phone Consultation	Clarksville	0.25	
971	1/17/2011	Betty Harrell	Energy Audit	Fort Smith	3	90
972	1/5/2011	Robert Motes	Blower Door	Van Buren	4	80
973	1/18/2011	Vonelle Vanzant	Energy Audit	Greenwood	3	80
974	1/24/2011	Argest Hylar	Audit	Mulberry	3	30
975	1/31/2011	Timothy Mooney	Audit	Van Buren	3	70
976	2/2/2011	Danna Taylor	Audit	Scranton	4	90
977	2/1/2011	Julie Byram	Phone consultation	Alma	0.25	
978	2/7/2011	Stephanie Willis	Energy Audit	Ozark	2	20
979	2/7/2011	Jimmy Lee	Phone consultation	Waldron	0.25	
980	2/7/2011	University of the Ozarks	Presentation	Clarksville	3	52
981	2/18/2011	TSP trtaining class	Class	Conway, AR	24	200
982	2/22/2011	Jeanette Erb	Energy Audit	Alma	3	80
983	2/22/2011	Joyce Lewis	Energy Audit	Alma	3	80
984	2/23/2011	John Ennis	Energy Audit	Dover	3	100
985	3/2/2011	Erin Sarten	energy audit	magazine	3	80
986	3/3/2011	Robert McTyre	Energy Audit	Mountainburg	6	80
987	3/4/2011	Omid Seyed-Sadr	Energy Audit	Van Buren	3	80
988	3/7/2011	Mardall Moon	Energy Audit	Van Buren	3	80
989	3/9/2011	Florence Page	Energy Audit	Delaware	3	80
990	3/14/2011	Kenny Goodwin	Energy Audit	Alma	3	80
991	3/14/2011	Wesley Dillard	Energy Audit	Alma	3	80
992	3/16/2011	Dorothy Kendrick	Energy Audit	Alma	3	80
993	3/16/2011	Juanita Shepard	Energy Audit	Rudy	3	80
994	3/17/2011	Jim Wayne Putman	Energy Audit	Fort Smith	3	80
995	3/17/2011	Artie Goff	Energy Audit	Booneville	3	80
996	3/6/2011	BPI Certification Class	energy audit class	Little Rock	40	370
997	3/14/2011	James St. Amant	Audit	Greenwood	4	120
998	3/16/2011	Michael (Keitha) Brannick	Member Services	London	4	90
999	3/17/2011	David (Sonia) Archer	Audit	Hartford	4	150
1000	3/17/2011	Agnes Solomon	Audit	Van Buren	3	60
1001	3/18/2011	Gene Paul Reed	Energy Audit	Alma	3	60
1002	3/21/2011	Jim Stauffer	Energy Audit	Boles, AR	4	180
1003	3/22/2011	Teena Pitts	Energy Audit	Van Buren	3	80
1004	3/24/2011	Hobert Robison	Phone consultation	Branch	0.25	
1005	3/24/2011	Wesley Don Mainer	Energy Audit	Greenwood	3	90
1006	3/25/2011	John Avey	Energy Audit	Mulberry	3	40
1007	3/28/2011	Arlis Owen	Energy Audit	New Blaine	3	80
1008	3/29/2011	James Harty	Energy Audit	Ozark	3	20
1009	4/6/2011	Benjamin Kulp	Energy Audit	Boles, AR	6	120
1010	4/15/2011	Thomas Sarten	Energy Audit	magazine	3	40
1011	4/19/2011	Dale Armstead	Phone Consultation	Greenwood	0.25	
1012	4/26/2011	Betty Reeves	Energy Audit	Van Buren	3	80
1013	5/9/2011	Clyde Shepard	Phone Consultation	Van Buren	0.25	
1014	5/12/2011	Baldor Energy Seminar	Training	Fort Smith	6	92
1015	5/13/2011	Penny Jackson	Energy Audit	Cedarville	3	100
1016	5/23/2011	Alaric Parrish	Blower Door	Fort Smith	12	160
1017	6/7/2011	Robert Carter	Energy Audit	Alma	3	80
1018	6/8/2011	Verdie Triplett	Blower Door	Spiro	6	120
1019	6/8/2011	Dr. Neill Treece	Energy Audit	Fort Smith	6	80
1020	6/10/2011	Amber Jones	Energy Audit	Dover	4	160
1021	6/13/2011	Larry McCreary	Energy Audit	Ozark	3	30
1022	6/14/2011	Thomas Barrett	Energy Audit	Alma	3	60
1023	6/14/2011	Matthew Jones	Energy Audit	Rudy	3	80
1024	6/15/2011	Laura Kennedy	Audit	Knoxville	3	80
1025	6/15/2011	Kerry Nordin	Audit	Knoxville	2	
1026	6/22/2011	Judy King	Phone consultation	Coal Hill	0.5	
1027	6/22/2011	William Paul Johnson	Audit	Dover	4	90
1028	6/27/2011	Candina Lay	Blower Door	Hackett	6	100
1029	6/29/2011	William Holmes	Energy Audit	Ozark	2	10
1030	7/12/2011	William Mullen	Energy Audit	Mansfield	4	120
1031	7/13/2011	Nick Allen	Energy Audit	Fort Smith	3	100
1032	7/11/2011	Lorene Pierce	Phone consultation	Booneville	0.25	
1033	7/11/2011	Louise Cox	Phone consultation	Ratcliff	0.75	
1035	7/15/2011	Gerald Avillion	Energy Audit	Fort Smith	3	90
1036	7/18/2011	Edward Jones	Energy Audit	Alma	3	80
1037	7/21/2011	Julie Lamb	Blower Door	Greenwood	6	100

1038	7/25/2011	Amy Sharum	Blower Door	Greenwood	6	100
1039	7/27/2011	Kelly Hicks	Blower Door	Fort Smith	3	100
1040	7/28/2011	Mark Crawford	Blower Door	Rudy	3	20
1041	7/28/2011	Cindy Walters	Blower Door	Rudy	3	20
1042	7/28/2011	Larry Parrish	Blower Door	Rudy	3	20
1043	7/29/2011	Peggy Wood	Energy Audit	Van Buren	3	80
1044	8/10/2011	Thomas Fleri	Energy Audit	Fort Smith	3	80
1045	8/15/2011	Jim Huff	Blower Door	Greenwood	6	100
1046	8/15/2011	Katy Graf	Energy Audit	Greenwood	4	80
1047	8/17/2011	Rhonda Ferguson	Energy Audit	Pocola	3	100
1048	8/18/2011	Jeffrey Wilson	Blower Door	Fort Smith	6	90
1049	8/19/2011	Jackie Ray	Energy Efficient Makeover Runner-u	Chester	4	120
1050	8/19/2011	ARVAC Energy Seminar	Seminar	Waldron	5	112
1051	8/22/2011	K Alan Whitson	Blower door test	Fort Smith	4	80
1052	8/23/2011	Richard Strite III	Energy Audit	Van Buren	2	80
1053	8/24/2011	Leonard Howard	Blower Door	Alma	9	80
1054	8/25/2011	Kimberly Mahar	Energy Audit	Van Buren	3	80
1055	8/29/2011	Charles Wilkinson	Energy Audit	Charleston	3	40
1056	9/7/2011	Walter Webb	Energy Audit	Greenwood	3	80
1057	9/9/2011	Martin Sanchez	Energy Audit	Clarksville	3	60
1058	9/15/2011	Mark Spradlin	Energy Audit	fort smith	6	100
1059	9/21/2011	Charles Sampson	Energy Audit	Fort Smith	2	80
1060	10/11/2011	Richard Dean	Energy Audit	Boles, AR	4	120
1061	10/13/2011	Jack Wityak	Blower door	Greenwood	6	80
1062	10/20/2011	Sir Benjamin Hendrickson	Energy Audit	Van Buren	3	80
1063	10/21/2011	Dennis Hooten	Energy Audit	Van Buren	3	80
1064	10/25/2011	Ronald Metcalf	Energy Audit	fort smith	3	80
1065	10/27/2011	Kelly Burt	Energy Audit	fort smith	3	80
1066	11/2/2011	Tri-State Member Service Conference	Training	Hot Springs	24	400
1067	11/9/2011	Patricia Rugoff	Audit	Delaware	6	160
1068	11/11/2011	Alan Love	Audit	Fort Smith	3	90
1069	11/14/2011	Yvonne Jones	Audit	Van Buren	3	70
1070	11/21/2011	Tom Meadors	Audit	Mulberry	3	46
1071	11/23/2011	Steve Coleman	Blower Door	Fort Smith	5	90
1072	11/30/2011	James Alford	Blower door	Greenwood	6	120
1073	11/30/2011	Racheal Calderon	Audit	Greenwood	2	
1074	12/5/2011	Edward Boyd	Audit	Alma	4	50
1075	12/6/2011	Dianne Krebill	Audit	Hartman	2	40
1076	12/6/2011	Gerald Ledford	Audit	Dover	4	120
1077	12/8/2011	Mike Henson	Audit	Van Buren	3	70
1078	12/9/2011	Adam Kyniston	Audit	Lamar	3	80
1079	12/14/2011	Kathy Miller	Audit	Cedarville	3	80
1080	12/15/2011	Energy Management Workshop	Training	Ozark	10	6
1081	12/16/2011	Karen Price	Audit	Van Buren	2	70
1082	12/30/2011	Brad Thomas	Audit	Van Buren	3	70
1083	12/7/2011	Energy Efficiency Program	Presentation	Alma	3	60
1084	12/31/2011	Willie's World E-Newsletter	E-Newsletter	all	36	0

120 518.5 9348

- 1047 8/17/2011 Rhonda Ferguson
- 1048 8/18/2011 Jeffrey Wilson
- 1049 8/19/2011 Jeffrey Wilson
- 1050 8/19/2011 Rhonda Ferguson
- 1051 8/23/2011 ARVAC Energy Seminar
- 1052 8/23/2011 K Alan Wilkerson
- 1053 8/24/2011 Richard Strie III
- 1054 8/24/2011 Leonard Hebard
- 1055 8/29/2011 Kenneth Mehr
- 1056 9/7/2011 Charles Johnson
- 1057 9/7/2011 Valerie Wachsz
- 1058 9/8/2011 Mark Spelman
- 1059 9/21/2011 Charles Simpson
- 1060 10/1/2011 Rick Dean
- 1061 10/1/2011 Rick Wray
- 1062 10/20/2011 St. Basil's Monastery
- 1063 10/21/2011 Dennis Parnell
- 1064 10/25/2011 Bernard McCall
- 1065 10/27/2011 Kelly Bur
- 1066 11/2/2011 NYS State Member Service Conference
- 1067 11/9/2011 Patricia Ruggitt
- 1068 11/11/2011 Alan Love
- 1069 11/14/2011 Yvonne Jones
- 1070 11/21/2011 Tom Meadows
- 1071 11/23/2011 Steve Coleman
- 1072 11/30/2011 James Alford
- 1073 12/02/2011 Richard Calderon
- 1074 12/05/2011 Edward Boyd
- 1075 12/6/2011 Dennis Kiehl
- 1076 12/6/2011 Gerald Ledford
- 1077 12/8/2011 Mike Henson
- 1078 12/9/2011 Adam Nystron
- 1079 12/14/2011 Kathy Miller
- 1080 12/15/2011 Energy Management Workshop
- 1081 12/16/2011 Karen Price
- 1082 12/30/2011 Brad Thomas
- 1083 12/31/2011 Energy Efficiency Program
- 1084 12/31/2011 Willie's World E-Newsletter

Needs to replace thermostat weather-stopping around doors, caulk around all windows, etc.
 Needs to put weather-stopping around doors, add foam gaskets behind outlets and switches, seal up door latch holes, etc. 23 ACH
 Delivered Hot Water Heater to the Runner-up Winner
 spoke to group of 30 individuals who receive ARVAC assistance on utility bills. Discussed energy efficiency tips, gave away 44 CFLs as door prizes
 40 yr old home, tested well, adequate insulation, no duct problem, older HVAC equipment, biggest issue is that lady of the home keeps AC at 68, far less than recommended temp. They have 4 ton, 14 SEER unit, but put to heavy test in high temp days
 Needs to replace HVAC unit, also needs to turn pool pump off, etc.
 Needs to fix or repair HVAC unit. (To many tons for the house 6 tons for 1700 sq ft.) caulk around windows, weather-stopping doors, add insulation in the attic, etc.
 Needs to replace old HVAC unit, caulk around windows, weather-stopping around doors, foam gaskets behind outlets and switches, etc.
 Needs to add insulation, weather-stopping around doors, foam gaskets behind outlets and switches, etc.
 Need to fix or replace out HVAC unit, firm over the old windows, foam gaskets behind outlets and switches, etc.
 Need to put new roof, put under penning back on, change out HVAC unit to a more energy efficiency unit, etc.
 Needs to turn pool pumps off, turn thermostat up to 78
 Need to add insulation in the attic; firm on windows, ennerflex is needed for the attic, need to add cfls
 Need to change out MR, 16 s out to a more energy efficient ones, add foam gaskets behind outlets and switches, etc.
 32 ACH. Need to caulk and seal up all door latches, seal up and insulated attic access.
 Needs to add foam gaskets behind outlets and switches, etc.
 Needs to caulk around windows, weather-stopping around the doors, foam gaskets behind outlets and switches
 Needs to add foam gaskets behind outlets and switches, add CFL lights, turn down the thermostat, need to fix or replace HVAC unit
 Need to repair HVAC unit, add insulation in the attic, turn lights off when not at home
 performing conference, attended seminars discussing energy efficiency and best practices
 did audit, hvac outdated, recommended upgrade, otherwise house in good condition, gave 1 CFL
 hbc, lives in small apartment, hvac very outdated, apartment insulated fairly well overall, gave 1 CFL
 older farm house, in need of better attic insulation, gave energy tips, 1 CFL
 did blower door test on home, recommended additional insulation, gave 1 CFL
 did blower door test on home, recommended additional insulation, gave 1 CFL
 hbc, checked insulation, needs caulk, weather stripping around doors and windows, etc, gave 1 CFL
 hbc, taught well built home, Mr. Boyd concerned about usage, nothing found that seems unusual in our opinion
 old farm house, very poorly insulated, old inefficient electric furnace, Ms. Krebill is a renter, gave her several suggestions to present to her landlord, gave 1 CFL
 hbc, concerned about hvac usage in shop building, usage very low at time of audit, will monitor usage for customer to try and discover cause
 requested audit, checked insulation (needs 5-6 inches more in attic), has high summer usage, due to pool, but can't put on timer because wife gives swimming lessons, wants filter on all the time, gave 1 CFL
 mobile home, in pretty good shape, does have resistance heat, found one spot to repair in underpinning, but don't suspect duct damage at this time, gave 1 CFL
 hbc, mobile home not well insulated, but has high usage for last month, discovered issue with water heater, bad element, causes unusually high kWh usage, turned off breaker to water heater until repair is made
 attended workshop on energy efficiency given at ATU-Ozark, Tony also addressed group about power factor correction and effects on commercial bills
 hbc, renter who has concerns about adequate attic insulation, checked it out, needs to add several inches of blown in caulkase, gave various energy tips, 1 CFL
 customer with concerns about adequate attic insulation, checked it out, needs to add several inches of blown in caulkase, gave various energy tips, answered questions from audience, gave 12 CFLs
 presented program on energy efficiency to Mt. View Methodist Church, north of Alma, discussed with audience various energy tips, answered questions from audience, gave 12 CFLs
 Energy efficiency tips

ID	Date	Audit, Meeting or Call Name	Auditor	Associated Costs \$	Total Man Hours	Total Mileage \$	Grand Total	Est Annual Savings \$	Renewable
962	1/6/2011	Gene (Anna) Niece	Kevin		12.50				
963	1/6/2011	Oren Atchley	Kevin		12.50				
966	1/6/2011	Sandra Lingo	Aaron	0.00	150.00	30.00		400.00	
967	1/12/2011	Lee Moore	Aaron	0.00	150.00	50.00		700.00	
968	1/13/2011	Henry (Elaine)Moore	Kevin	2.00	200.00	50.00			
969	1/13/2011	Linda Fitzner	Kevin	2.00	150.00	40.00			
970	1/17/2011	James Reasoner	Tony		12.50				
971	1/17/2011	Bethy Harrell	Aaron, Kevin	0.00	150.00	45.00		800.00	
972	1/5/2011	Robert Motes	Aaron, Kevin	2.00	200.00	40.00		300.00	
973	1/18/2011	Vonelle Vanzant	Aaron	0.00	150.00	40.00		300.00	
974	1/24/2011	Argest Hyler	Kevin	2.00	150.00	15.00			
975	1/31/2011	Timothy Mooney	Kevin	2.00	150.00	35.00			
976	2/2/2011	Danna Taylor	Kevin	2.00	200.00	45.00			
977	2/1/2011	Julie Byram	Kevin		12.50				
978	2/7/2011	Stephanie Willis	Aaron	0.00	100.00	10.00		700.00	
979	2/7/2011	Jimmy Lee	Kevin		12.50				
980	2/7/2011	University of the Ozarks	Kevin		150.00	26.00			
981	2/18/2011	TSP training class	Aaron	317.60	1,200.00	100.00			
982	2/22/2011	Jeanette Erb	aaron	0.00	150.00	40.00		600.00	
983	2/22/2011	Joyce Lewis	Aaron	0.00	150.00	40.00		600.00	
984	2/23/2011	John Ennis	Aaron	0.00	150.00	50.00		300.00	
985	3/2/2011	Erin Sarten	Aaron	0.00	150.00	40.00		500.00	
986	3/3/2011	Robert McTyre	Aaron	0.00	300.00	40.00		350.00	
987	3/4/2011	Omid Seyed-Sadr	Aaron	0.00	150.00	40.00		400.00	
988	3/7/2011	Mardall Moon	aaron	0.00	150.00	40.00		400.00	
989	3/9/2011	Florence Page	Aaron	0.00	150.00	40.00		1,000.00	
990	3/14/2011	Kenny Goodwin	Aaron	0.00	150.00	40.00		300.00	
991	3/14/2011	Wesley Dillard	Aaron	0.00	150.00	40.00		500.00	
992	3/16/2011	Dorothy Kendrick	Aaron	0.00	150.00	40.00		300.00	
993	3/16/2011	Juanita Shepard	Aaron	0.00	150.00	40.00		400.00	
994	3/17/2011	Jim Wayne Putman	Aaron	0.00	150.00	40.00		400.00	
995	3/17/2011	Artie Goff	Aaron	0.00	150.00	40.00		500.00	
996	3/6/2011	BPI Certification Class	Kevin	1,700.00	2,000.00	185.00			
997	3/14/2011	James St. Amant	Kevin	2.00	200.00	60.00			
998	3/16/2011	Michael (Keitha) Brannick	Kevin	2.00	200.00	45.00			
999	3/17/2011	David (Sonia) Archer	Kevin	2.00	200.00	75.00			
1000	3/17/2011	Agnes Solomon	Kevin	2.00	150.00	30.00		500.00	
1001	3/18/2011	Gene Paul Reed	Aaron	0.00	150.00	30.00		300.00	
1002	3/21/2011	Jim Stauffer	Aaron		200.00	90.00		700.00	
1003	3/22/2011	Teena Pitts	Aaron	0.00	150.00	40.00			
1004	3/24/2011	Hobert Robison	Kevin		12.50				
1005	3/24/2011	Wesley Don Mainer	Aaron	0.00	150.00	45.00		300.00	
1006	3/25/2011	John Avey	Aaron	0.00	150.00	20.00		700.00	
1007	3/28/2011	Arlis Owen	Aaron	0.00	150.00	40.00		300.00	
1008	3/29/2011	James Harty	Aaron	0.00	150.00	10.00		300.00	
1009	4/6/2011	Benjamin Kulp	Aaron, Kevin	0.00	300.00	60.00		300.00	
1010	4/15/2011	Thomas Sarten	Aaron	0.00	150.00	20.00		200.00	
1011	4/19/2011	Dale Armstead	Kevin		12.50	40.00			
1012	4/26/2011	Betty Reeves	Aaron	0.00	150.00				
1013	5/9/2011	Clyde Shepard	Kevin		12.50	46.00			
1014	5/12/2011	Baldor Energy Seminar	Kevin		300.00	50.00		600.00	
1015	5/13/2011	Penny Jackson	Aaron	0.00	150.00	80.00		500.00	
1016	5/23/2011	Alaric Parrish	Aaron, Kevin, Tony, Gre	2.00	600.00			300.00	
1017	6/7/2011	Robert Carter	Aaron	0.00	150.00	40.00			

1018	6/8/2011	Verdie Triplett	Aaron, Kevin	300.00	60.00	300.00	300.00
1019	6/8/2011	Dr. Neill Treece	Aaron, Greg, Kevin	300.00	40.00	300.00	300.00
1020	6/10/2011	Amber Jones	Aaron	200.00	80.00	200.00	500.00
1021	6/13/2011	Larry McCreary	Aaron	150.00	15.00	150.00	500.00
1022	6/14/2011	Thomas Barrett	Aaron	150.00	30.00	150.00	500.00
1023	6/14/2011	Matthew Jones	Aaron	150.00	40.00	150.00	800.00
1024	6/15/2011	Laura Kennedy	Kevin	150.00	40.00	150.00	
1025	6/15/2011	Kerry Nordin	Kevin	100.00			
1026	6/22/2011	Judy King	Kevin	25.00			
1027	6/22/2011	William Paul Johnson	Kevin	200.00	45.00	200.00	
1028	6/27/2011	Candina Lay	Aaron, Kevin	300.00		300.00	300.00
1029	6/29/2011	William Holmes	Aaron	100.00	5.00	100.00	400.00
1030	7/1/2011	William Mullen	Aaron	200.00	60.00	200.00	300.00
1031	7/13/2011	Nick Allen	aaron	150.00	50.00	150.00	300.00
1032	7/11/2011	Lorene Pierce	Kevin	12.50			
1033	7/11/2011	Louise Cox	Kevin	37.50			
1035	7/15/2011	Gerald Avillion	Aaron	150.00	45.00	150.00	300.00
1036	7/18/2011	Edward Jones	Aaron	150.00	40.00	150.00	200.00
1037	7/21/2011	Julie Lamb	Aaron, Kevin	300.00	50.00	300.00	300.00
1038	7/25/2011	Amy Sharum	Aaron, Kevin	300.00	50.00	300.00	200.00
1039	7/27/2011	Kelly Hicks	Aaron, Kevin	150.00	50.00	150.00	200.00
1040	7/28/2011	Mark Crawford	Aaron, Kevin	150.00	10.00	150.00	200.00
1041	7/28/2011	Cindy Walters	Aaron, Kevin	150.00	10.00	150.00	300.00
1042	7/28/2011	Larry Parrish	Aaron, Kevin	150.00	10.00	150.00	300.00
1043	7/29/2011	Peggy Wood	Aaron	150.00	40.00	150.00	400.00
1044	8/10/2011	Thomas Fleri	Aaron	150.00	40.00	150.00	300.00
1045	8/15/2011	Jim Huff	Aaron, Kevin	300.00	50.00	300.00	300.00
1046	8/15/2011	Katy Graf	Aaron, Kevin	200.00	40.00	200.00	200.00
1047	8/17/2011	Rhonda Ferguson	Aaron	150.00	50.00	150.00	200.00
1048	8/18/2011	Jeffrey Wilson	Aaron, Tony	300.00	45.00	300.00	
1049	8/19/2011	Jackie Ray	Aaron, Greg	200.00	60.00	200.00	
1050	8/19/2011	ARVAC Energy Seminar	Kevin	250.00	56.00	250.00	
1051	8/22/2011	K Alan Whitson	Kevin	200.00	40.00	200.00	400.00
1052	8/23/2011	Richard Strite III	Aaron	100.00	40.00	100.00	400.00
1053	8/24/2011	Leonard Howard	Aaron, Tony, Kevin	450.00	40.00	450.00	400.00
1054	8/25/2011	Kimberly Mahar	Aaron	150.00	40.00	150.00	200.00
1055	8/29/2011	Charles Wilkinson	Aaron	150.00	20.00	150.00	300.00
1056	9/7/2011	Walter Webb	Aaron	150.00	40.00	150.00	400.00
1057	9/9/2011	Martin Sanchez	Aaron	150.00	30.00	150.00	400.00
1058	9/15/2011	Mark Spradlin	Aaron, Tony, Kevin	300.00	50.00	300.00	300.00
1059	9/21/2011	Charles Sampson	Aaron	100.00	40.00	100.00	300.00
1060	10/11/2011	Richard Dean	aaron	200.00	60.00	200.00	200.00
1061	10/13/2011	Jack Wityak	Aaron, Kevin	300.00	40.00	300.00	200.00
1062	10/20/2011	Sir Benjamin Hendrickson	Aaron, Kevin	150.00	40.00	150.00	100.00
1063	10/21/2011	Dennis Hooten	Aaron, Kevin	150.00	40.00	150.00	100.00
1064	10/25/2011	Ronald Metcalf	aaron	150.00	40.00	150.00	400.00
1065	10/27/2011	Kelly Burt	Aaron	150.00	40.00	150.00	300.00
1066	11/2/2011	Tri-State Member Service Conference	Kevin, Greg, Aaron	1,200.00	200.00	1,200.00	
1067	11/9/2011	Patricia Rugoff	Kevin, Aaron	300.00	80.00	300.00	
1068	11/11/2011	Alan Love	Kevin	150.00	45.00	150.00	
1069	11/14/2011	Yvonne Jones	Kevin	150.00	35.00	150.00	
1070	11/21/2011	Tom Meadors	Kevin	200.00	23.00	200.00	
1071	11/23/2011	Steve Coleman	Kevin, Aaron	250.00	45.00	250.00	
1072	11/30/2011	James Alford	Kevin, Aaron	300.00	60.00	300.00	
1073	11/30/2011	Racheal Calderon	Kevin, Aaron	100.00		100.00	

1074	12/5/2011	Edward Boyd	Kevin, Aaron		200.00	25.00
1075	12/6/2011	Dianne Krebill	Kevin	2.00	100.00	20.00
1076	12/6/2011	Gerald Ledford	Kevin		200.00	60.00
1077	12/8/2011	Mike Henson	Kevin	2.00	150.00	35.00
1078	12/9/2011	Adam Kyniston	Kevin	2.00	150.00	40.00
1079	12/14/2011	Kathy Miller	Kevin		150.00	40.00
1080	12/15/2011	Energy Management Workshop	Kevin, Tony		500.00	3.00
1081	12/16/2011	Karen Price	Kevin		100.00	35.00
1082	12/30/2011	Brad Thomas	Kevin	2.00	150.00	35.00
1083	12/7/2011	Energy Efficiency Program	Kevin	24.00	150.00	30.00
1084	12/31/2011	Willie's World E-Newsletter	Tony	0.00	1,800.00	
				\$2,205.60	\$25,925.00	\$4,674.00
						\$27,050.00
						\$32,804.60

ID	Date	Audit, Meeting or Call Name	Type	City	Man Hours	Est Mileage	Auditor	Associated Costs \$	Total Man Hours \$	Total Mileage \$	Grand Total	Est Annual Savings \$
966	1/6/2011	Sandra Lingo	Energy Audit	Hunt	3	60	Aaron	0.00	150.00	30.00	30.00	400.00
967	1/12/2011	Lee Moore	Energy Audit	Waldron	3	100	Aaron	0.00	150.00	50.00	50.00	700.00
968	1/13/2011	Henry (Eliane) Moore	Audit	Dover	4	100	Kevin	2.00	200.00	50.00	50.00	
969	1/13/2011	Linda Fitzner	Audit	Ozone	3	80	Kevin	2.00	150.00	40.00	40.00	
971	1/17/2011	Betty Harrell	Energy Audit	Fort Smith	3	90	Aaron, Kevin	0.00	150.00	45.00	45.00	800.00
972	1/5/2011	Robert Moles	Blower Door	Van Buren	4	80	Aaron, Kevin	2.00	200.00	40.00	40.00	300.00
973	1/18/2011	Vonelle Vanzant	Energy Audit	Greenwood	3	80	Aaron	0.00	150.00	40.00	40.00	300.00
974	1/24/2011	Argest Hyler	Audit	Mulberry	3	30	Kevin	2.00	150.00	15.00	15.00	
975	1/31/2011	Timothy Moorey	Audit	Van Buren	3	70	Kevin	2.00	150.00	35.00	35.00	700.00
976	2/2/2011	Danna Taylor	Audit	Scranton	4	90	Kevin	2.00	200.00	45.00	45.00	600.00
978	2/7/2011	Stephanie Willis	Energy Audit	Ozark	2	20	Aaron	0.00	100.00	10.00	10.00	600.00
982	2/22/2011	Jeanette Erb	Energy Audit	Alma	3	80	aaron	0.00	150.00	40.00	40.00	600.00
983	2/22/2011	Joyce Lewis	Energy Audit	Alma	3	80	Aaron	0.00	150.00	40.00	40.00	300.00
984	2/23/2011	John Ernis	Energy Audit	Dover	3	100	Aaron	0.00	150.00	50.00	50.00	500.00
985	3/2/2011	Erin Sarten	energy audit	magazine	3	80	Aaron	0.00	150.00	40.00	40.00	350.00
986	3/3/2011	Robert McTyre	Energy Audit	Mountainburg	6	80	Aaron	0.00	300.00	40.00	40.00	400.00
987	3/4/2011	Omid Seyed-Sadr	Energy Audit	Van Buren	3	80	Aaron	0.00	150.00	40.00	40.00	400.00
988	3/7/2011	Mardall Moon	Energy Audit	Van Buren	3	80	aaron	0.00	150.00	40.00	40.00	1,000.00
989	3/9/2011	Florence Page	Energy Audit	Delaware	3	80	Aaron	0.00	150.00	40.00	40.00	300.00
990	3/14/2011	Kenny Goodwin	Energy Audit	Alma	3	80	Aaron	0.00	150.00	40.00	40.00	500.00
991	3/14/2011	Wesley Dillard	Energy Audit	Alma	3	80	Aaron	0.00	150.00	40.00	40.00	300.00
992	3/16/2011	Dorothy Kendrick	Energy Audit	Alma	3	80	Aaron	0.00	150.00	40.00	40.00	400.00
993	3/16/2011	Juanita Shepard	Energy Audit	Rudy	3	80	Aaron	0.00	150.00	40.00	40.00	400.00
994	3/17/2011	Jim Wayne Pulman	Energy Audit	Fort Smith	3	80	Aaron	0.00	150.00	40.00	40.00	400.00
995	3/17/2011	Artie Goff	Energy Audit	Booneville	4	80	Aaron	0.00	200.00	60.00	60.00	500.00
997	3/14/2011	James St. Amant	Audit	Greenwood	3	120	Kevin	2.00	200.00	75.00	75.00	
999	3/17/2011	David (Sonia) Archer	Audit	Hartford	4	150	Kevin	2.00	200.00	30.00	30.00	500.00
1000	3/17/2011	Aghes Solomon	Audit	Van Buren	3	60	Kevin	2.00	150.00	30.00	30.00	300.00
1001	3/18/2011	Gene Paul Reed	Energy Audit	Alma	3	60	Aaron	0.00	150.00	90.00	90.00	700.00
1002	3/21/2011	Jim Stauffer	Energy Audit	Boles, AR	4	180	Aaron	0.00	200.00	40.00	40.00	300.00
1003	3/22/2011	Tarena Pitts	Energy Audit	Van Buren	3	80	Aaron	0.00	150.00	45.00	45.00	700.00
1005	3/24/2011	Wesley Don Mainer	Energy Audit	Greenwood	3	90	Aaron	0.00	150.00	20.00	20.00	300.00
1006	3/25/2011	John Avey	Energy Audit	Mulberry	3	40	Aaron	0.00	150.00	10.00	10.00	300.00
1007	3/28/2011	Arlis Owen	Energy Audit	New Blaine	3	80	Aaron	0.00	150.00	10.00	10.00	300.00
1008	3/29/2011	James Hartly	Energy Audit	Ozark	3	20	Aaron	0.00	300.00	60.00	60.00	200.00
1009	4/6/2011	Benjamin Kulp	Energy Audit	Boles, AR	6	120	Aaron, Kevin	0.00	150.00	20.00	20.00	600.00
1010	4/15/2011	Thomas Sarten	Energy Audit	magazine	3	40	Aaron	0.00	150.00	80.00	80.00	500.00
1012	4/26/2011	Betty Reeves	Energy Audit	Van Buren	3	80	Aaron	0.00	150.00	40.00	40.00	300.00
1015	5/13/2011	Penny Jackson	Energy Audit	Cedarville	3	100	Aaron	0.00	600.00	40.00	40.00	300.00
1016	5/23/2011	Aletric Parrish	Blower Door	Fort Smith	12	160	Aaron, Kevin, Tony, Greg	2.00	300.00	60.00	60.00	300.00
1017	6/7/2011	Robert Carter	Energy Audit	Alma	3	80	Aaron	0.00	300.00	40.00	40.00	300.00
1018	6/8/2011	Verdie Triplett	Blower Door	Spiro	6	120	Aaron, Kevin	0.00	300.00	60.00	60.00	300.00
1019	6/8/2011	Dr. Neill Treece	Energy Audit	Fort Smith	6	80	Aaron, Greg, Kevin	0.00	300.00	80.00	80.00	500.00
1020	6/10/2011	Amber Jones	Energy Audit	Dover	4	160	Aaron	0.00	200.00	15.00	15.00	500.00
1021	6/13/2011	Larry McCreary	Energy Audit	Ozark	3	30	Aaron	0.00	150.00	30.00	30.00	800.00
1022	6/14/2011	Thomas Barrett	Energy Audit	Alma	3	80	Aaron	0.00	150.00	40.00	40.00	
1023	6/14/2011	Matthew Jones	Energy Audit	Rudy	3	80	Aaron	0.00	150.00	40.00	40.00	
1024	6/15/2011	Laura Kennedy	Audit	Knoxville	3	80	Kevin	2.00	150.00	40.00	40.00	
1025	6/15/2011	Kerry Nordin	Audit	Knoxville	2	Kevin		2.00	100.00	45.00	45.00	300.00
1027	6/22/2011	William Paul Johnson	Audit	Dover	4	90	Kevin	2.00	200.00	50.00	50.00	400.00
1028	6/27/2011	Candina Lay	Blower Door	Hackett	6	100	Aaron, Kevin	0.00	100.00	50.00	50.00	300.00
1029	6/29/2011	William Holmes	Energy Audit	Ozark	2	10	Aaron	0.00	200.00	50.00	50.00	300.00
1030	7/12/2011	William Mullen	Energy Audit	Mansfield	4	120	Aaron	0.00	150.00	50.00	50.00	300.00
1031	7/13/2011	Nick Allen	Energy Audit	Fort Smith	3	100	aaron	0.00	150.00	45.00	45.00	200.00
1035	7/15/2011	Gerald Avillion	Energy Audit	Fort Smith	3	90	Aaron	0.00	150.00	40.00	40.00	300.00
1036	7/18/2011	Edward Jones	Energy Audit	Alma	3	80	Aaron	2.00	150.00	50.00	50.00	
1037	7/21/2011	Julie Lamb	Blower Door	Greenwood	6	100	Aaron, Kevin	2.00	300.00	45.00	45.00	300.00

1038	7/25/2011	Amy Sharnum	Greenwood	Blower Door	6	100 Aaron, Kevin	2 00	300 00	50 00	200 00
1039	7/27/2011	Kelly Hicks	Fort Smith	Blower Door	3	100 Aaron, Kevin	2 00	150 00	50 00	300 00
1040	7/28/2011	Mark Crawford	Rudy	Blower Door	3	20 Aaron, Kevin	2 00	150 00	10 00	200 00
1041	7/28/2011	Cindy Walters	Rudy	Blower Door	3	20 Aaron, Kevin	2 00	150 00	10 00	200 00
1042	7/28/2011	Larry Parrish	Rudy	Blower Door	3	20 Aaron, Kevin	2 00	150 00	10 00	200 00
1043	7/29/2011	Peggy Wood	Van Buren	Energy Audit	3	80 Aaron	0 00	150 00	40 00	300 00
1044	8/10/2011	Thomas Fieri	Fort Smith	Energy Audit	3	80 Aaron	0 00	150 00	40 00	400 00
1045	8/15/2011	Jim Huff	Greenwood	Blower Door	6	100 Aaron, Kevin	2 00	300 00	50 00	300 00
1046	8/15/2011	Katy Graf	Greenwood	Energy Audit	4	80 Aaron, Kevin	0 00	200 00	40 00	200 00
1047	8/17/2011	Rhonda Ferguson	Pocola	Energy Audit	3	100 Aaron	0 00	150 00	50 00	300 00
1048	8/18/2011	Jeffrey Wilson	Fort Smith	Blower Door	6	90 Aaron, Tony	2 00	300 00	45 00	200 00
1051	8/22/2011	K Alan Whiston	Fort Smith	Blower door tes	4	80 Kevin	2 00	200 00	40 00	200 00
1052	8/23/2011	Richard Sirtle III	Van Buren	Energy Audit	2	80 Aaron	0 00	100 00	40 00	400 00
1053	8/24/2011	Leonard Howard	Alma	Blower Door	9	80 Aaron, Tony, Kevin	2 00	450 00	40 00	400 00
1054	8/25/2011	Kimberly Mahler	Van Buren	Energy Audit	3	80 Aaron	0 00	150 00	40 00	200 00
1055	8/29/2011	Charles Wilkinson	Charlesston	Energy Audit	3	40 Aaron	0 00	150 00	20 00	300 00
1056	9/7/2011	Walker Webb	Greenwood	Energy Audit	3	80 Aaron	0 00	150 00	40 00	400 00
1057	9/9/2011	Martin Sanchez	Clarksville	Energy Audit	3	60 Aaron	0 00	150 00	30 00	400 00
1058	9/15/2011	Mark Spradlin	fort smith	Energy Audit	6	100 Aaron, Tony, Kevin	0 00	300 00	50 00	400 00
1059	9/21/2011	Charles Sampson	Fort Smith	Energy Audit	2	80 Aaron	2 00	100 00	40 00	300 00
1060	10/11/2011	Richard Dean	Boles, AR	Energy Audit	4	120 aaron	0 00	200 00	60 00	300 00
1061	10/13/2011	Jack Wityak	Greenwood	Blower door	6	80 Aaron, Kevin	2 00	300 00	40 00	200 00
1062	10/20/2011	Sir Benjamin Hendrickson	Van Buren	Energy Audit	3	80 Aaron, Kevin	0 00	150 00	40 00	100 00
1063	10/21/2011	Dennis Hooten	Van Buren	Energy Audit	3	80 Aaron, Kevin	0 00	150 00	40 00	400 00
1064	10/25/2011	Ronald Metcalfe	fort smith	Energy Audit	3	80 aaron	0 00	150 00	40 00	400 00
1065	10/27/2011	Kelly Burt	fort smith	Energy Audit	3	80 Aaron	0 00	150 00	40 00	300 00
1067	11/9/2011	Patricia Rugoff	Delaware	Audit	6	160 Kevin, Aaron	2 00	300 00	80 00	400 00
1068	11/11/2011	Alan Love	Fort Smith	Audit	3	90 Kevin	2 00	150 00	45 00	300 00
1069	11/14/2011	Yvonne Jones	Van Buren	Audit	3	70 Kevin	2 00	150 00	35 00	300 00
1070	11/21/2011	Tom Meadors	Mulberry	Audit	3	46 Kevin	2 00	150 00	23 00	200 00
1071	11/23/2011	Steve Coleman	Fort Smith	Blower Door	5	90 Kevin, Aaron	2 00	250 00	45 00	100 00
1072	11/30/2011	James Alford	Greenwood	Blower door	6	120 Kevin, Aaron	2 00	300 00	60 00	400 00
1073	11/30/2011	Racheal Calderon	Greenwood	Audit	2	Kevin, Aaron	2 00	100 00	25 00	300 00
1074	12/5/2011	Edward Boyd	Alma	Audit	4	50 Kevin, Aaron	2 00	200 00	20 00	27,050.00
1075	12/6/2011	Dianne Krabill	Hartman	Audit	2	40 Kevin	2 00	100 00	20 00	21,797.00
1076	12/6/2011	Gerald Ledford	Dover	Audit	4	120 Kevin	2 00	200 00	60 00	3,923.00
1077	12/8/2011	Mike Henson	Van Buren	Audit	3	70 Kevin	2 00	150 00	35 00	17,800.00
1078	12/9/2011	Adam Kyniston	Lamar	Audit	3	80 Kevin	2 00	150 00	40 00	74.00
1079	12/14/2011	Kathy Miller	Cedarville	Audit	3	80 Kevin	2 00	150 00	40 00	35 00
1081	12/16/2011	Karen Price	Van Buren	Audit	2	70 Kevin	2 00	100 00	35 00	27,050.00
1082	12/30/2011	Brad Thomas	Van Buren	Audit	3	70 Kevin	2 00	150 00	35 00	21,797.00

ID Date Audit, Meeting or Call Name Type City Man Hours Est Mileage Auditor Associated Costs \$ Total Man Hours \$ Total Mileage \$ Grand Total Est Annual Savings \$ Renewable

ID	Date	Audit, Meeting or Call Name	Type	City	Man Hours	Est Mileage	Auditor	Associated Costs \$	Total Man Hours \$	Total Mileage \$	Grand Total	Est Annual Savings \$	Renewable
981	2/18/2011	TSP training class	Class	Conway, AR	24	200	Aaron	317.60	1,200.00	100.00			
996	3/6/2011	BPI Certification Class	energy audit class	Little Rock	40	370	Kevin	1,700.00	2,000.00	185.00			
1014	5/12/2011	Baldor Energy Seminar	Training	Fort Smith	6	92	Kevin		300.00	46.00			
1066	11/2/2011	Tri-State Member Services Conferen	Training	Hot Springs	24	400	Kevin, Greg, Aaron		1,200.00	200.00			
1080	12/15/2011	Energy Management Workshop	Training	Ozark	10	6	Kevin, Tony		500.00	3.00			
					5	1068		2,017.60	5,200.00	534.00	7,751.60		0

ID	Date	Audit, Meeting or Call Name	Type	City	Man Hours Est	Mileage	Auditor	Associated Costs \$	Total Man Hours \$	Total Mileage \$	Grand Total Est Annual Savings \$	Renewable
962	1/6/2011	Gene (Anna) Niece	Phone consultation	Van Buren	0.25		Kevin		12.50			
963	1/6/2011	Oren Atchley	Phone consultation	Fort Smith	0.25		Kevin		12.50			
970	1/17/2011	James Reasoner	Phone Consultation	Clarksville	0.25		Tony		12.50			
977	2/1/2011	Julie Byram	Phone consultation	Alma	0.25		Kevin		12.50			
979	2/7/2011	Jimmy Lee	Phone consultation	Waldron	0.25		Kevin		12.50			
998	3/16/2011	Michael (Keitha) Brannick	Member Services	London	4		90 Kevin	2.00	200.00	45.00		
1004	3/24/2011	Hobert Robison	Phone consultation	Branch	0.25		Kevin		12.50			
1011	4/19/2011	Dale Armstead	Phone Consultation	Greenwood	0.25		Kevin		12.50			
1013	5/9/2011	Clyde Shepard	Phone Consultation	Van Buren	0.25		Kevin		12.50			
1026	6/22/2011	Judy King	Phone consultation	Coal Hill	0.5		Kevin		25.00			
1032	7/11/2011	Lorene Pierce	Phone consultation	Booneville	0.25		Kevin		12.50			
1033	7/11/2011	Louise Cox	Phone consultation	Ratcliff	0.75		Kevin		37.50			
					12	7.5	90	\$2.00	\$375.00	\$45.00	\$422.00	

ID	Date	Audit, Meeting or Call Name	Type	City	Man Hours	Est Mileage	Auditor	Associated Costs \$	Total Man Hours \$	Total Mileage \$	Grand Total	Est Annual Savings \$	Renewable
980	2/7/2011	University of the Ozarks	Presentation	Clarksville	3	52	Kevin		150.00	26.00			
1049	8/19/2011	Jackie Ray	Energy Efficient Makeover	Chester	4	120	Aaron, Greg	0.00	200.00	60.00			
1050	8/19/2011	ARVAC Energy Seminar	Seminar	Waldron	5	112	Kevin	88.00	250.00	56.00			
1083	12/7/2011	Energy Efficiency Program	Presentation	Alma	3	60	Kevin	24.00	150.00	30.00			
				4	15	344		\$112.00	\$750.00	\$172.00	\$1,034.00		

ID 1084 **Date** 12/31/2011 **Audit, Meeting or Call Name** Willie's World E-Newsletter **Type** E-Newsletter **City** all **Man Hours Est Mileage** 36 **Comments** 0 Energy efficiency Tip Tony **Auditor Associated Costs \$** 0.00 **Total Man Hours \$** 1,800.00 **Total Mileage \$** 0.00 **Grand Total** **Est Annual Savings \$** **Renewable**

1	36	0	\$0.00	\$1,800.00	\$0.00	\$1,800.00
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Count	Man Hours	Est Mileage	Associated Costs \$	Total Man Hours \$	Total Mileage \$	Grand Total	Est Annual Savings \$	Renewable
98	356	7846	\$74.00	\$17,800.00	\$3,923.00	\$21,797.00	\$27,050.00	\$0.00
5	104	1068	\$2,017.60	\$5,200.00	\$534.00	\$7,751.60	\$0.00	\$0.00
12	75	90	\$2.00	\$375.00	\$45.00	\$422.00	\$0.00	\$0.00
4	15	344	\$112.00	\$750.00	\$172.00	\$1,034.00	\$0.00	\$0.00
1	36	0	\$0.00	\$1,800.00	\$0.00	\$1,800.00	\$0.00	\$0.00
120	518.5	9348	\$2,205.60	\$25,925.00	\$4,674.00	\$32,804.60	\$27,050.00	\$0.00

Together We Save Deemed Savings Report
Arkansas Valley Electric Cooperative

Year	Expenses	Website Visits*	Total Co-op Deemed Savings*	Pages/Visit*	Avg. Time*
2009-2010	\$30,000	151	\$57,225.07	4.5	3:55
2011	\$30,000	62	\$11,799.00	5	5:28
Totals	\$60,000	213	\$69,024.07		

*Figures provided by www.togetherwesave.com

Estimated Kwh Savings	602,369
Estimated BTU Savings	2,055,885,936
Average Savings/Visitor	\$324.06

Date	Audit, Meeting or Call Name	Type	Total Man Hours	\$ Total Mileage	\$ Associated Costs	\$ Grand Total
1/5/2011	Robert Motes	Blower Door	\$200.00	\$40.00		\$2.00
1/6/2011	Oren Atchley	Phone consultation	\$12.50			
1/6/2011	Sandra Lingo	Energy Audit	\$150.00	\$30.00		\$0.00
1/6/2011	Gene (Anna) Niece	Phone consultation	\$12.50			
1/12/2011	Lee Moore	Energy Audit	\$150.00	\$50.00		\$0.00
1/13/2011	Henry (Elaine)Moore	Audit	\$200.00	\$50.00		\$2.00
1/13/2011	Linda Fitzner	Audit	\$150.00	\$40.00		\$2.00
1/17/2011	Betty Harrell	Energy Audit	\$150.00	\$45.00		\$0.00
1/17/2011	James Reasoner	Phone Consultation	\$12.50			
1/18/2011	Vonelle Vanzant	Energy Audit	\$150.00	\$40.00		\$0.00
1/24/2011	Argest Hyler	Audit	\$150.00	\$15.00		\$2.00
1/31/2011	Timothy Mooney	Audit	\$150.00	\$35.00		\$2.00
2/1/2011	Julie Byram	Phone consultation	\$12.50			
2/2/2011	Danna Taylor	Audit	\$200.00	\$45.00		\$2.00
2/7/2011	University of the Ozarks	Presentation	\$150.00	\$26.00		
2/7/2011	Stephanie Willis	Energy Audit	\$100.00	\$10.00		\$0.00
2/7/2011	Jimmy Lee	Phone consultation	\$12.50			
2/18/2011	TSP trtaining class	Class	\$1,200.00	\$40.00		\$317.60
2/22/2011	Joyce Lewis	Energy Audit	\$150.00	\$40.00		\$0.00
2/22/2011	Jeanette Erb	Energy Audit	\$150.00	\$40.00		\$0.00
2/23/2011	John Ennis	Energy Audit	\$150.00	\$50.00		\$0.00
3/2/2011	Erin Sarten	energy audlt	\$150.00	\$40.00		\$0.00
3/3/2011	Robert McTyre	Energy Audit	\$300.00	\$40.00		\$0.00
3/4/2011	Omid Seyed-Sadr	Energy Audit	\$150.00	\$40.00		\$0.00
3/6/2011	BPI Certification Class	energy audit class	\$2,000.00	\$185.00		\$1,700.00
3/7/2011	Mardail Moon	Energy Audit	\$150.00	\$40.00		\$0.00
3/9/2011	Florence Page	Energy Audit	\$150.00	\$40.00		\$0.00
3/14/2011	Kenny Goodwin	Energy Audit	\$150.00	\$40.00		\$0.00
3/14/2011	Wesley Dillard	Energy Audit	\$150.00	\$40.00		\$0.00
3/14/2011	James St. Amant	Audit	\$200.00	\$60.00		\$2.00
3/16/2011	Dorothy Kendrick	Energy Audit	\$150.00	\$40.00		\$0.00
3/16/2011	Juanita Shepard	Energy Audit	\$150.00	\$40.00		\$0.00
3/16/2011	Michael (Keitha) Brannick	Member Services	\$200.00	\$45.00		\$2.00
3/17/2011	Agnes Solomon	Audit	\$150.00	\$30.00		\$2.00
3/17/2011	Artie Goff	Energy Audit	\$150.00	\$40.00		\$0.00
3/17/2011	Jim Wayne Putman	Energy Audit	\$150.00	\$40.00		\$0.00
3/17/2011	David (Sonia) Archer	Audit	\$200.00	\$75.00		\$2.00
3/18/2011	Gene Paul Reed	Energy Audit	\$150.00	\$30.00		\$0.00
3/21/2011	Jim Stauffer	Energy Audit	\$200.00	\$90.00		
3/22/2011	Teena Pitts	Energy Audlt	\$150.00	\$40.00		\$0.00
3/24/2011	Wesley Don Mainer	Energy Audit	\$150.00	\$45.00		\$0.00
3/24/2011	Hobert Robison	Phone consultation	\$12.50			
3/25/2011	John Avey	Energy Audit	\$150.00	\$20.00		\$0.00
3/28/2011	Arlis Owen	Energy Audit	\$150.00	\$40.00		\$0.00
3/29/2011	James Harty	Energy Audit	\$150.00	\$10.00		\$0.00
4/6/2011	Benjamin Kulp	Energy Audit	\$300.00	\$60.00		\$0.00
4/15/2011	Thomas Sarten	Energy Audit	\$150.00	\$20.00		\$0.00
4/19/2011	Dale Armstead	Phone Consultation	\$12.50			
4/26/2011	Betty Reeves	Energy Audit	\$150.00	\$40.00		\$0.00
5/9/2011	Clyde Shepard	Phone Consultation	\$12.50			
5/12/2011	Baldor Energy Seminar	Training	\$300.00	\$46.00		
5/13/2011	Penny Jackson	Energy Audit	\$150.00	\$50.00		\$0.00
5/23/2011	Alaric Parrish	Blower Door	\$600.00	\$80.00		\$2.00
6/7/2011	Robert Carter	Energy Audit	\$150.00	\$40.00		\$0.00
6/8/2011	Dr. Neill Treece	Energy Audit	\$300.00	\$40.00		\$0.00
6/8/2011	Verdie Triplett	Blower Door	\$300.00	\$60.00		\$0.00
6/10/2011	Amber Jones	Energy Audit	\$200.00	\$80.00		\$0.00
6/13/2011	Larry McCreary	Energy Audit	\$150.00	\$15.00		\$0.00
6/14/2011	Thomas Barrett	Energy Audit	\$150.00	\$30.00		\$0.00
6/14/2011	Matthew Jones	Energy Audit	\$150.00	\$40.00		\$0.00
6/15/2011	Kerry Nordin	Audit	\$100.00			\$2.00
6/15/2011	Laura Kennedy	Audit	\$150.00	\$40.00		\$2.00
6/22/2011	Judy King	Phone consultation	\$25.00			
6/22/2011	William Paul Johnson	Audit	\$200.00	\$45.00		
6/27/2011	Candina Lay	Blower Door	\$300.00	\$50.00		\$2.00
6/29/2011	William Holmes	Energy Audit	\$100.00	\$5.00		\$0.00
7/11/2011	Lorene Pierce	Phone consultation	\$12.50			
7/11/2011	Louise Cox	Phone consultation	\$37.50			
7/12/2011	William Mullen	Energy Audit	\$200.00	\$60.00		\$0.00
7/13/2011	Nick Allen	Energy Audit	\$150.00	\$50.00		\$0.00
7/15/2011	Gerald Avillion	Energy Audit	\$150.00	\$45.00		\$0.00
7/18/2011	Edward Jones	Energy Audit	\$150.00	\$40.00		\$2.00
7/21/2011	Julie Lamb	Blower Door	\$300.00	\$50.00		\$2.00
7/25/2011	Amy Sharum	Blower Door	\$300.00	\$50.00		\$2.00
7/27/2011	Kelly Hicks	Blower Door	\$150.00	\$50.00		\$2.00
7/28/2011	Larry Parrish	Blower Door	\$150.00	\$10.00		\$2.00
7/28/2011	Mark Crawford	Blower Door	\$150.00	\$10.00		\$2.00
7/28/2011	Cindy Walters	Blower Door	\$150.00	\$10.00		\$2.00
7/29/2011	Peggy Wood	Energy Audit	\$150.00	\$40.00		\$0.00
8/10/2011	Thomas Fleri	Energy Audit	\$150.00	\$40.00		\$0.00
8/15/2011	Jim Huff	Blower Door	\$300.00	\$50.00		\$2.00
8/15/2011	Katy Graf	Energy Audit	\$200.00	\$40.00		\$0.00
8/17/2011	Rhonda Ferguson	Energy Audit	\$150.00	\$50.00		\$0.00

8/18/2011	Jeffrey Wilson	Blower Door	\$300.00	\$45.00	\$2.00		
8/19/2011	Jackie Ray	Energy Efficient Makeover Runner-i	\$200.00	\$60.00	\$0.00		
8/19/2011	ARVAC Energy Seminar	Seminar	\$250.00	\$56.00	\$88.00		
8/22/2011	K Alan Whitson	Blower door test	\$200.00	\$40.00	\$2.00		
8/23/2011	Richard Strite III	Energy Audit	\$100.00	\$40.00	\$0.00		
8/24/2011	Leonard Howard	Blower Door	\$450.00	\$40.00	\$2.00		
8/25/2011	Kimberly Mahar	Energy Audit	\$150.00	\$40.00	\$0.00		
8/29/2011	Charles Wilkinson	Energy Audit	\$150.00	\$20.00	\$0.00		
9/7/2011	Walter Webb	Energy Audit	\$150.00	\$40.00	\$0.00		
9/9/2011	Martin Sanchez	Energy Audit	\$150.00	\$30.00	\$0.00		
9/15/2011	Mark Spradlin	Energy Audit	\$300.00	\$50.00	\$0.00		
9/21/2011	Charles Sampson	Energy Audit	\$100.00	\$40.00	\$2.00		
10/11/2011	Richard Dean	Energy Audit	\$200.00	\$60.00	\$0.00		
10/13/2011	Jack Wityak	Blower door	\$300.00	\$40.00	\$2.00		
10/20/2011	Sir Benjamin Hendrickson	Energy Audit	\$150.00	\$40.00	\$0.00		
10/21/2011	Dennis Hooten	Energy Audit	\$150.00	\$40.00	\$0.00		
10/25/2011	Ronald Metcalf	Energy Audit	\$150.00	\$40.00	\$0.00		
10/27/2011	Kelly Burt	Energy Audit	\$150.00	\$40.00	\$0.00		
11/2/2011	Tri-State Member Service Conferen	Training	\$1,200.00	\$200.00			
11/9/2011	Patricia Rugoff	Audit	\$300.00	\$80.00	\$2.00		
11/11/2011	Alan Love	Audit	\$150.00	\$45.00	\$2.00		
11/14/2011	Yvonne Jones	Audit	\$150.00	\$35.00	\$2.00		
11/21/2011	Tom Meadors	Audit	\$150.00	\$23.00	\$2.00		
11/23/2011	Steve Coleman	Blower Door	\$250.00	\$45.00	\$2.00		
11/30/2011	James Alford	Blower door	\$300.00	\$60.00	\$2.00		
11/30/2011	Racheal Calderon	Audit	\$100.00		\$2.00		
12/5/2011	Edward Boyd	Audit	\$200.00	\$25.00			
12/6/2011	Dianne Krebill	Audit	\$100.00	\$20.00	\$2.00		
12/6/2011	Gerald Ledford	Audit	\$200.00	\$60.00			
12/7/2011	Energy Efficiency Program	Presentation	\$150.00	\$30.00	\$24.00		
12/8/2011	Mike Henson	Audit	\$150.00	\$35.00	\$2.00		
12/9/2011	Adam Kyniston	Audit	\$150.00	\$40.00	\$2.00		
12/14/2011	Kathy Miller	Audit	\$150.00	\$40.00			
12/15/2011	Energy Management Workshop	Training	\$500.00	\$3.00			
12/16/2011	Karen Price	Audit	\$100.00	\$35.00			
12/30/2011	Brad Thomas	Audit	\$150.00	\$35.00	\$2.00		
12/31/2011	Wjllie's World E-Newsletter	E-Newsletter	\$1,800.00		\$0.00		
			120	\$25,925.00	\$4,614.00	\$2,205.60	\$32,744.60

**2011 AVECC Energy Efficiency Report Ex. C
Arkansas Valley Electric Cooperative**

Type	Count	Man Hours	Man Hours \$	Mileage	Mileage \$	Deemed Savings
Audits/Blower Doors	98	356	\$17,800.00	7846	\$3,923.00	\$27,050.00
Training	5	104	\$5,200.00	1068	\$534.00	
Consultations	12	7.5	\$375.00	90	\$45.00	
Events/Presentations	4	15	\$750.00	344	\$172.00	
Other	1	36	\$1,800.00	0	\$0.00	
Total	120	518.5	\$25,925.00	9348	\$4,674.00	\$27,050.00

EE Ad/Marketing \$49,000.00

CFL's & Assoc. Costs \$2,205.60

Touchstone \$10,500.00

AVECC Website \$2,000.00

Grand Total **\$94,304.00**

Estimated Kwh Savings **284,737**

Estimated BTU Savings **971,806,842**

Average Savings \$276.02

Woodruff Electric Cooperative Corporation

Docket No. 08-056-RP

Woodruff Electric Cooperative Corporation

2011 Energy Efficiency and Conservation Efforts

Please refer to Woodruff Electric's report on energy efficiency efforts submitted for the year 2007 for the cooperative's philosophy on the efficient use of energy. Continuing programs are described below including program costs and benefits.

Energy Efficiency Programs

***Timely Topics* Newsletter**

The newsletter, *Timely Topics*, is published and mailed with each bill monthly. Although the newsletter addresses various topics related to the cooperative, approximately 35% of the space was directed at energy efficiency in 2011. This 35% is equivalent to \$3,862 in publishing costs alone for 2011, and does not include employee labor, overhead and expenses involved in the production.

***Rural Arkansas* Magazine**

The *Rural Arkansas* magazine is sent to each cooperative member each month. Likewise, approximately 11% of the available space for 2011 was dedicated to energy efficiency education. Woodruff Electric's cost for this 11% was \$5,303.

Radio and Television Ads

Woodruff Electric pays directly for radio and TV ads to relay a variety of messages related to the co-op. In 2011, approximately 65% of those ads were directed toward energy efficiency education for a total of \$7,188.

Newspaper Ads

Approximately 10% of newspaper ad space bought by WECC in 2011 was directed toward energy efficiency education and amounted to \$448.

Website

Approximately 35% of the WECC website was aimed at energy efficiency in 2011 for a total of \$3,150.

Marathon Water Heater Sales and Lease Program

In January 2004, Woodruff Electric began a program to sell and lease Marathon water heaters. The cooperative embarked on this program because of the belief that Marathon was the most efficient, best made water heater on the market, and because of these facts, it is also very expensive. The expense certainly has something to do with the fact that there are few retail outlets that stock the Marathon. WECC wanted to provide a service by making the water heaters available for sale, while making them affordable to the average consumer. The sales and lease options have accomplished these goals. In 2011, 23 Marathons were leased to cooperative members and 36 were sold to members

and non-members. The GE heat pump water heater was also promoted and made available for sale.

Civic Programs

Programs are made available to civic and other organizations pertaining to energy efficiency. The Forrest City radio station, KXJK, has a talk show each morning, and a WECC representative is the guest on that program once or twice per year. Energy efficiency is usually the primary topic. A program was presented to Forrest City Lion's Club on energy efficiency.

Programs on energy efficiency were presented to approximately 20 low income clients of Crowley's Ridge Development Council.

Doug Rye, the energy efficiency expert, presented a seminar to the general public in Wynne in March at which approximately 30 people attended.

Home Visits to Resolve High Bill Complaints/ Energy Audits or Recommendations Made during Phone Conversations

No less than 22 visits were made in 2011 to resolve high bill complaints and/or conduct energy audits or give advice for saving energy. Costs associated with these were \$3,721 in time, labor and transportation. Malfunctioning equipment and/or appliances found during visits would amount to an annualized cost, if not corrected, of \$9,400. Recommendations were also made for energy efficiency improvements that would provide an estimated \$4,940 in annual savings if the recommendations were followed.

Irrigation Load Control Program

Woodruff Electric has approximately 5,000 irrigation accounts, of which approximately 4,200 participate in the load control program. Those who participate allow the cooperative to install a switch on their irrigation pumps that can be controlled by WECC personnel when AECC is approaching a monthly demand peak. The savings from this program varies from year to year depending on several factors including weather and farming practices, but in 2011 the estimated savings to Woodruff Electric and its members, including approximately \$2.46 million credited directly back to the irrigators, totaled \$5.7 million. Approximately 700 residential air conditioner controls are in place that are responsible for avoiding approximately 500 kw of demand. These savings are included in the irrigation total.

Optional Large Industrial Rate

Large industrial customers have the option of choosing a rate on which they exercise their own load shedding/peak avoiding measures in order to decrease their contribution to the peak. They accomplish this by installing their own generation or by shifting their production to a summer schedule, or by a combination of the two. Total savings directly benefiting the customers amounted to approximately \$755,287 in 2011.

Imbedded Costs Spent on Energy Efficiency and Peak Avoidance

The above paragraphs have not addressed employee labor, transportation, equipment or overhead costs. Approximately \$195,611 was spent on customer assistance expenses directed at helping customers reduce their electric usage. Approximately

\$84,366 was spent on load control equipment and costs related to installation. Costs for these categories totaled \$279,977 for 2011.

Summary

Approximate costs spent by Woodruff Electric for energy efficiency and load shifting efforts as listed in this report total \$303,649.

Approximate savings directly or indirectly benefitting the membership, as totaled in this report equal \$6.5 million. This number does not include benefits from energy efficiency practices that may have been the result of WECC's educational efforts, and of which there is no record of such activity.

The above also does not include the costs of efforts sponsored by AECC, of which Woodruff Electric is a participating member. Likewise, the portion of savings benefitting AECC that were not allocated to WECC in the form of lower wholesale power costs (i.e.: delay or avoidance of generating plant construction), also are not included in this report.

Carroll Electric Cooperative Corporation

Docket No. 08-045-RP



**Carroll Electric
Coop. Corp.**

**2011
Energy Efficiency
and
Conservation Report**



Submitted to the
Arkansas Public Service Commission
Per Docket No. 06-004-R
(Developing and Implementing
Energy Efficiency Programs)

Box 4000 ♦ Berryville, AR 72616 ♦ 800-432-9720

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Mission Statement

***We exist to serve our members
with safe, reliable, and convenient electricity
at the lowest possible cost.***

Cooperative Energy Efficiency/Conservation Programs

As a cooperative, we exist to serve our members. Helping our members to conserve energy is consistent with our mission statement and continues to be a focal point of the services we provide. To accomplish energy efficiency and conservation, Carroll Electric Cooperative utilizes the following:

- **Energy Audits, High Bill Investigations, Misc. Field Visits, Building Leakage Tests, and Heating and Cooling Load Calculations.**

Carroll Electric Cooperative provides the above services free of charge for residential and small commercial accounts. These services are performed when a member would like advice about how to make his or her home or business more energy efficient. During 2011 Carroll Electric provided the following services:

Number of contacts	Labor Expense	Transportation Expense	Combined Labor and Transportation Expense
• 437 energy audits	\$92,230	\$21,974	\$114,204
• 152 high bill complaints	30,072	7,643	37,715
• 11 miscellaneous field visits	1,632	555	2,187
• 62 building leakage tests	12,266	3,117	15,383
• 4 heating and cooling load calcs	<u>791</u>	<u>201</u>	<u>992</u>
	\$136,991	\$33,490	\$170,481
		Total	\$170,481

After completing the field work for the above services, recommendations and notes are documented in our customer information system and scanned in the RVI system.

Carroll Electric Cooperative Corporation

Energy Audit High Bill Field Visit

Name: _____
 A/C#: _____
 Seal #: _____

Meter #: _____
 Current Meter Reading: _____ Date: _____
 Previous Meter Reading: _____ Date: _____

KWH used _____ + number of days _____ - average daily usage _____

Approximate Sq. Ft. of House Conditioned _____

1. WINDOWS – Type: _____

DOORS – Type: _____

RECOMMEND: Install weather-stripping _____ Use caulking _____

2. INSULATION INSTALLED (TYPE AND APPROX. R-VALUE) – Walls _____

Floors _____ Ceiling _____

Basement wall _____ Basement floor _____

RECOMMEND: Increase present amount of insulation to: _____

Walls R-19 _____ Floor R-19 _____ Ceiling R-38 _____ Basement walls R-19 _____ Basement ceiling R-19 _____

Vapor barrier should be turned toward heated area _____ Install 6-mil polyethylene ground cover _____

3. DUCT SYSTEM – Insulated _____ Location _____

RECOMMEND: Insulate supply ducts _____ Insulate air return _____ Check duct system for leaks and defects _____

4. HEATING SYSTEM

A. Heat pump _____

Age of heat pump _____ Compressor amps _____

Indoor/Outdoor fan amps _____ Auxiliary kw heat strips _____

B. Electric Furnace – kw heat strips _____ Fan amps _____

C. Other _____

RECOMMEND: Change or clean filters regularly Service unit Heat Pumps: Keep area clean around outdoor unit

5. FIREPLACE – How many _____ Location _____ Type _____

RECOMMEND: Install glass doors Install outside air supply Keep damper closed when not in use

6. PORTABLE HEATER/HEAT LAMP/HEAT TAPE – How many _____ Size _____ Location _____

RECOMMEND: _____

7. AIR CONDITIONER – _____

Compressor amps _____ Indoor/Outdoor fan amps _____ Age of A/C _____

RECOMMEND: Change or clean filter regularly Service unit Keep area clean around outside unit

8. TYPE OF ATTIC VENTILATION – Intake _____ Exhaust _____

9. WATER HEATER – Type _____ Location _____

Size _____ Top Element _____ Setting _____ Test _____

Bottom element _____ Setting _____ Test _____ No. in Family _____

RECOMMEND: Insulate tank with _____ inches insulation. Set thermostat at lowest satisfactory setting, approximately _____ degrees. Replace _____

10. WATER SYSTEM – Type _____ Size pump _____ h.p. Amps _____ Pressure tank _____ Water leaks _____

RECOMMEND: Correct defective pressure tank (waterlogged, leaks, etc.) _____

Correct leaks, faucets, lines, and etc. _____

11. WIRING – Inside/Outside _____

RECOMMEND: _____

Comments and/or recommendations are made for the purpose of energy conservation only. CECC will not be held responsible for any charges incurred or related to these recommendations.

See page 6 for example

A CECC representative has discussed the above information with me.

Member _____

Date _____

CECC Representative _____

Date _____

ENERGY AUDIT / HIGH BILL / FIELD VISIT - page 2

Name: _____

Account Location #: _____

Customer #: _____

A. Major electricity users in your home:

Heating:

Electric furnace _____ kwh per hr of operation
Electric baseboard heat _____ kwh per hr of operation
Electric ceiling cable Heat _____ kwh per hr of operation
Electric heat pump
 heat pump _____ kwh per hr of operation
 heat strips _____ kwh per hr of operation
 Total _____ kwh per hr of operation
Portable electric heater _____ kwh per hr of operation
Heat lamp or heat tape _____ kwh per hr of operation

Cooling:

Air Conditioning _____ kwh per hr of operation
Fan _____ kwh per hr of operation

B. Other Electric Appliances:

Electric water heater approx. _____ kwh per hour of operation
Refrigerator approx. _____ kwh per month
Freezer approx. _____ kwh per month
Washer approx. .33 _____ kwh per load or 1 kwh / 3 loads
Dryer approx. 5 _____ kwh per load
Dishwasher approx. 1 _____ kwh per load (with drying cycle and hot water 5 kwh)

Range:

1275-watt Small surface element approx. _____ kwh per hour of operation (when cycles 1/2 time)
2200-watt Large surface element approx. 1.1 _____ kwh per hour of operation (when cycles 1/2 time)
2900-watt Oven – Bake cycle approx. .7 _____ kwh per hour of operation (when cycles 1/4 time)
Oven – Broil cycle approx. 3.4 _____ kwh per hour of operation (full time)

<p>Kilowatt Hour (kwh) formula Volts x Amps = Watts Watts ÷ 1000 = kwh per hour</p>
--

Appliance operating costs vary widely due to differing lifestyles of families and varying efficiencies of the appliances themselves. The appliance operating estimates contained here have been gathered from varying sources and give only average figures. They are not meant to be exact but will give you a general idea of costs of operation and possible places to conserve.

Recommendations of the energy audits, high bills, and miscellaneous field visits are documented in the customer information system and scanned in the RVI system. An example is shown below.

Name		History of Contacts for Customer		Phone No	BERR14A	
2=Modify Entry		3=Complete	4=Trans Supr	5=Trans Rep	6=Cancel	S/O ...
Opt	Date	CMP	Customer Contacts		S/O LT	
—	10/04/2011	C 1			SWER	N N N N
—	9/06/2011	C			SWER	N N N N
—	7/29/2011	C	Notes		OEY	Y Y N N
—	6/24/2011	C	EA APPT AT 1:30 FOR JOEY M			Y Y N N
—	5/03/2011	C	SEE SCANNED IMAGES IN RVI			Y Y N N
10	3/03/2011	C			ORKE	N N N N
—	2/05/2010	C			OEY	Y Y N N
—	10/09/2007	C 1				N N Y Y
—	1/17/2006	C			ONNE	N N N N
					PP	N N N N

+
F12=Cancel

Carroll Electric Cooperative Corporation Energy Audit Recommendations

- Check or change your filter every 30 days. Use a pleated filter with a MERV rating of 8.
- Reinstall any floor insulation that has fallen down. Ensure it is fit directly against the floor decking.
- Consider adding 6 inches (R-22) of cellulose insulation to your attic. The cellulose acts as a cap for the fiberglass insulation that is already there. The cellulose will greatly slow air flow through the fiberglass insulation making it more effective.
- Currently your supply ductwork is flexible. Consider replacing it with metal ductwork. The metal ductwork will need to be sealed with mastic at each joint. Mastic is a permanent method of sealing ductwork.
- Keep the area around your outdoor unit clear of grass clippings, leaves, and anything else that can restrict airflow across the coil of your outdoor unit.
- Periodically wash the coil of your outdoor unit with a water hose.
- Consider wrapping your water heater with an insulating blanket.
- Use your space heaters sparingly. Using space heaters for extended periods of time can be costly.

Energy Audit

July 7, 2011

First United Methodist Church



Prepared by:

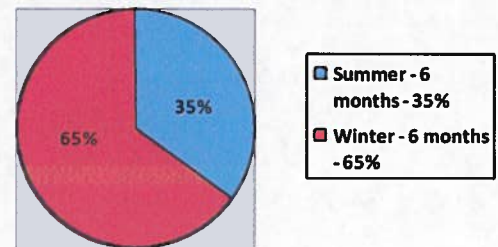


**Carroll Electric
Cooperative Corporation**

The following is a summary of the recommendations made to make your church operate more energy efficiently. Carroll Electric Cooperative was happy to provide this energy efficiency audit free of charge.

Upon review of the history of usage at this account, we see an average low usage of approximately [redacted] kilowatt-hours (kwh) per month and an average high usage of about [redacted] kwh per month. The usage at this account is primarily for heating and cooling the church. Conversely, lighting, miscellaneous appliances, and office equipment account for a small portion of usage at this account.

While improvements in lighting are helpful and productive, the results would have little effect on the overall bill. It is recommended to replace existing appliances and office equipment with Energy Star ones if the existing equipment is not operating properly. If existing equipment is operating properly, we do not recommend replacing the equipment. The greatest improvement can be seen from the highest users, the heating and cooling units. Every effort must be made to reduce the amount of operating time of these units. There are four 10-ton units, four 5-ton units, eight 4-ton units, and one 2.5-ton unit, for a total of 70.5 tons or 846,000 BTUH. The amount of electricity used, if all units are operating, is about 111 kwh per hour. If these units operate an average of six hours per day, the monthly usage would be approximately 19,980 kwh per month. During winter months the usage could be substantially higher due the operation of auxiliary heat equipment, a part of the normal operation of heat pumps when in heating mode. Considering 65% of annual usage occurs during the 6 winter months (October—March), **limiting the operation of auxiliary heat is imperative.**



There are several areas where improvement in operating efficiency of the units could be achieved. It is seldom that replacing a working unit will pay for itself in energy savings in a reasonable amount of time, unless, additional money must be spent to repair the original unit. Therefore we have concentrated our efforts to improving the heating/cooling systems in place.

Fresh air intake:

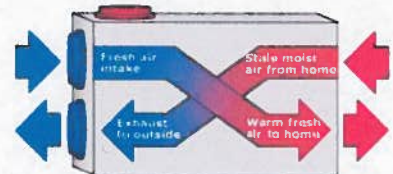


Law requires fresh outside air to be introduced into the heating and cooling system of all commercial buildings. The thought behind the law was buildings are made so air tight that air becomes stale and is unhealthy after being circulated several times. If buildings were that air tight there could be a problem, but in reality buildings are not even close to being air tight. But, laws must be followed. To lessen the impact of this fresh air intake, consider installing a damper in all intakes and adjust to fit normal occupancy. The amount of fresh air originally used is based on maximum occupancy of the building. If the building is half full, restrict intake to one-half of full open.

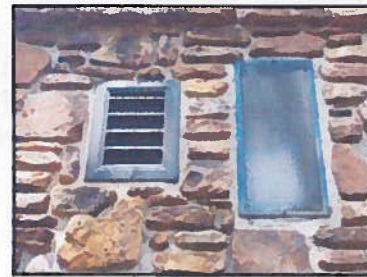
Positive and Negative Pressure:

You may have heard that a building has to breathe. This is not true. A building needs to be equally balanced to prevent it from breathing. If the pressure inside a building is higher than outside, the air inside will be pushed outside. If the pressure is lower inside a building than outside, the air will be pulled inside. In both cases, until the pressure is the same inside and outside, a building will continue to push or pull air.

The fresh air intakes currently being used do not have fresh air heat exchangers installed or exhaust any air for fresh air being introduced to the heating and cooling system. This causes a positive pressure to exist inside the church - pushing conditioned air from inside to the outside. To maintain equal pressure and to capture heating and cooling from exhaust air, we recommend installing an energy recovery ventilation system. These systems can be purchased and installed by a heating and cooling contractor.



Examples of fresh air intakes at your church



Return Air:

Industry standard for return air area is approximately two sq. ft per ton of capacity. Currently, the total capacity of your heat pumps is 70.5 tons, so approximately 141 sq. ft. of return is recommended. Currently, far less is available. Increase the size and number of returns available. The return pictured below is very noisy. This is another effect of undersized return air intakes. There should be 20 sq. ft. of return ducted to the unit below.



← Example of inadequately sized return air intake.

10 ton unit that accompanies undersized return. →



Do not restrict fresh air intake with a damper as recommended earlier in this report until more inside return area can be installed.

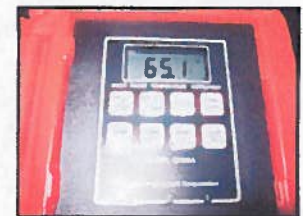
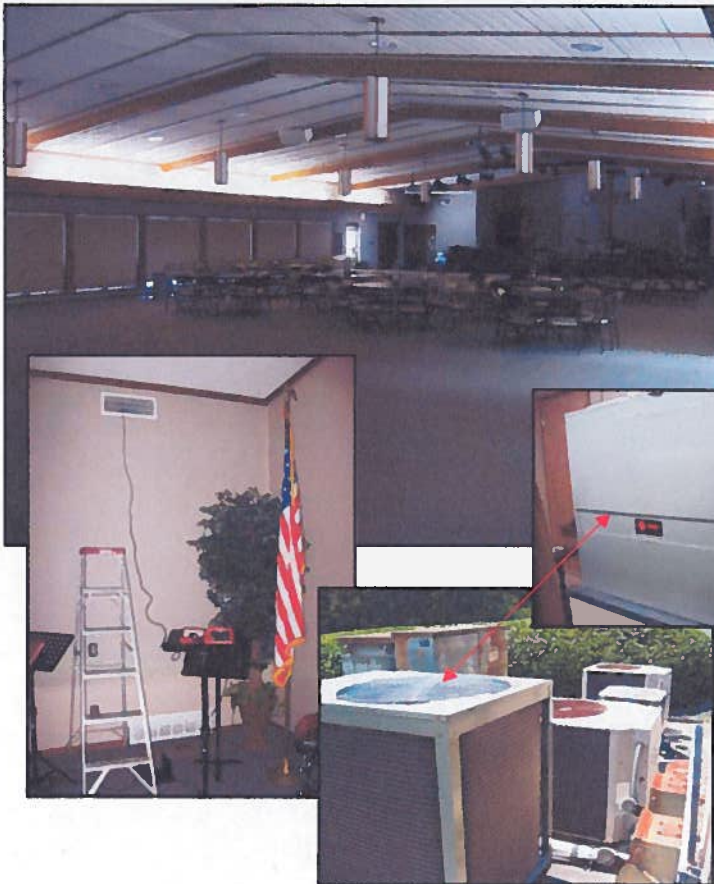
Air Temperatures:

There is a direct correlation between the efficiency of a heating and cooling unit and the temperatures it produces. When measuring air temperatures, it is important to pay close attention to the difference in temperature between the supply air being delivered to the space and the temperature of the air returning to the air handler. This temperature difference should be at least 20 degrees. If it is not, there is probably an opportunity to make efficiency improvements.

With heat pumps, efficient temperature readings during the cooling season typically indicate efficient temperature readings during the heating season. Also, if temperature readings during the cooling season indicate a unit is operating inefficiently, then it will typically operate inefficiently during the heating season as well. A unit operating inefficiently during the heating season is much more costly than one that is operating in the same manner during the cooling season. During the heating season, the auxiliary heat equipment will compensate for the lack of heat the heat pump is producing. Auxiliary heat is typically at least twice as expensive to operate when compared to a heat pump.

Temperature readings were taken at various units throughout the church.

Becker Hall



Supply Temperature

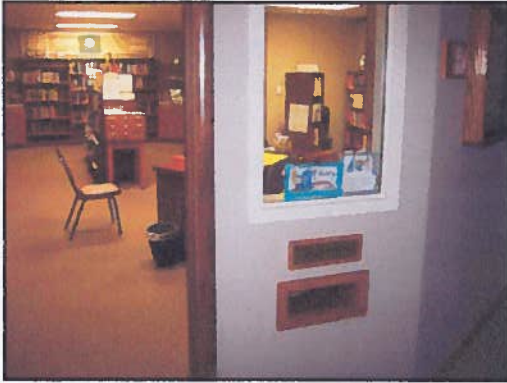


Return Temperature



Temperature Difference

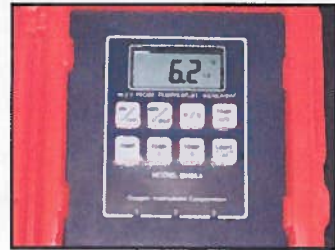
Library



Supply Temperature



Return Temperature



Temperature Difference



Downstairs Hallway



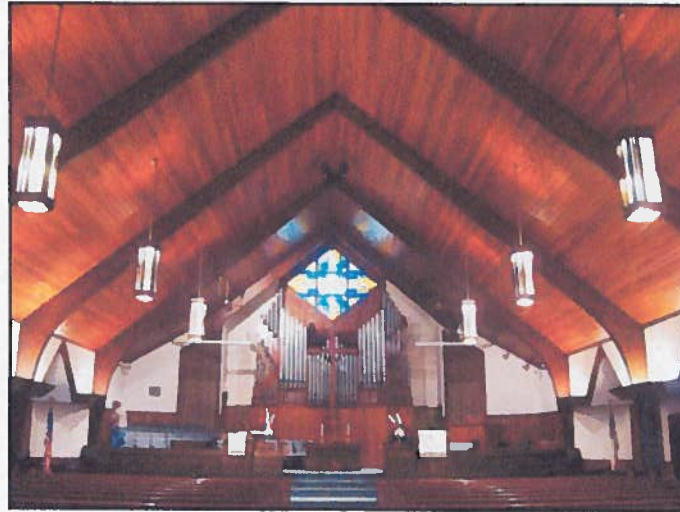
Supply Temperature	Return Temperature	Temperature Difference
60.9°	75°	14.1°

Of the three units that were sampled, none performed to our recommended specifications.

Possible Causes:

- Decreased airflow due to undersized return air intake
- Refrigerant level is too low — there could be a leak in the refrigerant lines or a coil
- Refrigerant level is too high — unit was improperly charged
- Leaky ductwork — ductwork needs to be sealed
- Fresh air intake — see previous fresh air explanation

Sanctuary

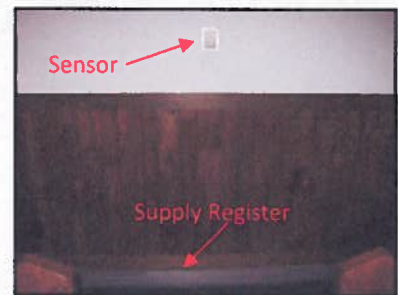


Two areas of concern were noted in the sanctuary.

- Location of thermostat sensors
- Undersized return air intakes and location of return air intakes

Location of Thermostat Sensors

There are four sensors in the sanctuary that send temperature readings to the thermostat in the office. The four readings are averaged and this average is displayed on the thermostat as the room temperature. Two of the sensors are not in ideal locations. The two toward the back of the sanctuary are positioned directly over supply registers. While the audit was conducted the system was in the cooling mode and the sensors were registering very cold readings relative to the actual room temperature (in the heating mode the sensors would also be fooled with relatively warmer air because of the proximity of the supply registers). This is true in the cooling mode. These low readings cause the thermostat to register false readings causing the units to short cycle. During the audit, when the unit would cycle on, it would only operate for about three minutes. An optimal cycle time for a heat pump is around 30 minutes. Moving the sensors away from the supply registers would remedy this issue. Consider installing these two sensors on the back wall of the sanctuary. Doing so will allow for a much more accurate room temperature average. Also, the temperature readings recorded in this short time were not within our recommended specifications. Longer time of operation would probably yield better temperature readings.

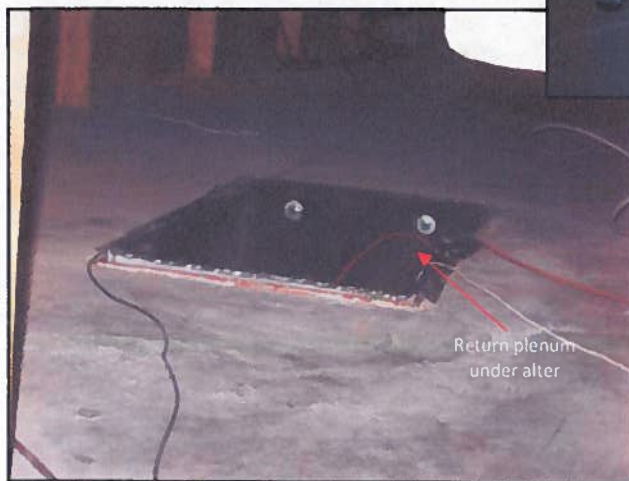
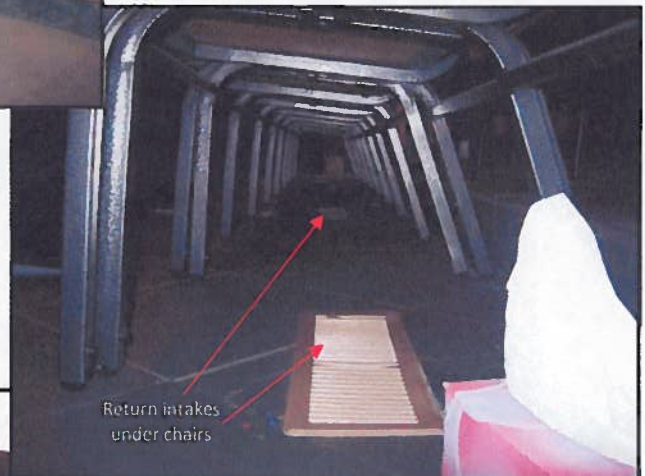
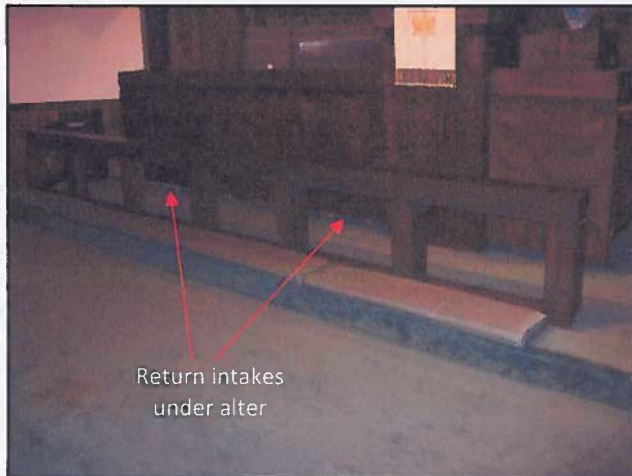


Supply Temperature	Return Temperature	Temperature Difference
60.1°	73.3°	13.2

Return Air Intakes

There are two 10-ton units dedicated to the sanctuary. On the day the audit was conducted, only one was in operation. As stated before, two square feet of return is needed for every one ton of cooling. The area across the front of the altar and the small intakes under the chairs on the altar do not offer enough return air grill space. Also, the plenum under the altar is too small. Adding another plenum of similar size would be increase the efficiency and life of the unit.

Also, it would be advantageous to add return air intakes to the back of the church. This would allow for a more even mix of air resulting in increased efficiency and comfort.



Miscellaneous Recommendations

Basement Units

In the basement two units share one duct system. The two units were installed in this manner in case the area of the basement they serve is ever at maximum capacity. These units are on a toggle switch that is labeled odd years and even years. Only one unit operates at a time. In speaking with church members, there has never been a need to operate both units simultaneously. Consider using one of these relatively new units to replace one of the older units that is operating inefficiently.



Water Heaters

- Consider turning off the large commercial water heater (27 kw) for the kitchen when it is not needed. Prominently post a sign in the kitchen explaining the breaker for this water heater needs to be turned on before using the kitchen and turned off when members are done using it.
- Consider wrapping all water heaters with R-19 batt insulation. Water heater blankets are made specifically for insulating water heaters can be purchased, their R value is 2.8 and are only about one inch thick. A 40 ft. roll of R-19 batt insulation (six inches thick) is similar in cost to one water heater blanket.

Exhaust Fans

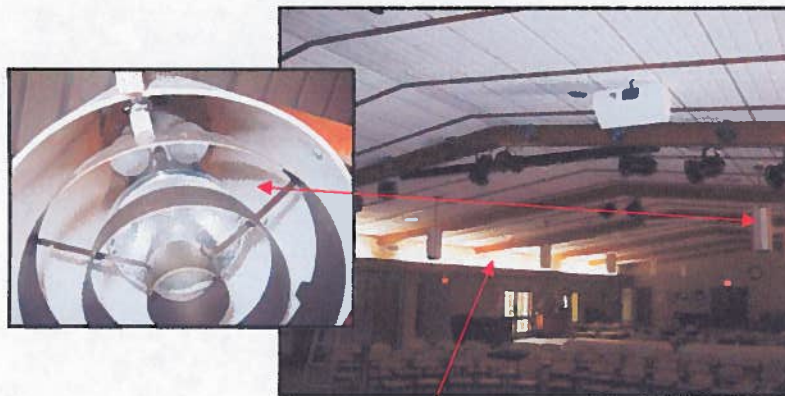
There are two exhaust fans attached to the outside of the church building. One is located in the closet in Becker Hall where the refrigerator and freezer are located. This room was much warmer than adjacent areas. Heat from the outside will naturally move to the cooler area inside. Also, the heat pump directly below the exhaust fans creates additional heat that is able to find its way into the building during the cooling season. During the heating season, the opposite occurs. Consider removing or sealing these fans. If they are sealed, ensure power to the fans is disconnected. If you choose to continue use of the exhaust fans, an air intake connected to the outside needs to be installed. As stated before, a balanced pressure needs to be maintained inside the church. Operating the fan without “make-up air” will cause an imbalance.



Lighting in Becker Hall

In Becker Hall, the light fixtures that hang from the ceiling have a variety of bulbs in them. The large bulb in each fixture is a 300 watt incandescent bulb. The three smaller bulbs above the large bulb are 40 watt incandescent bulbs. This comes to a total of 420 watts per fixture. There are 10 fixtures and they use a total of 4.2 kwh per hour of operation. Consider replacing all bulbs with compact fluorescent lamps (CFLs). This would bring the wattage per fixture down to 98 watts and the total usage down to 0.98 kwh per hour of operation. A secondary effect of the incandescent bulbs is heat. Each fixture generates 1,433 Btus per hour it operates. A total of 14,334 Btus are generated when all 10 fixtures are on. More than one ton of cooling is needed to offset the heat generated by these fixtures. If the incandescent bulbs were replaced with CFLs, a 77% reduction in heat and kwh per hour used would be realized.

If these fixtures have a dimmer switch, do not use CFLs.



T12 Fluorescent Light Fixtures

There are 38, four foot long, two lamp, T12 fluorescent light fixtures lining the side walls of Becker Hall (76 individual lamps). Each fixtures uses a total of 75 watts. This comes to a total of 2.85 kwh per hour of operation.

Each individual 34 watt, T12 lamp emits an average of about 2,610 lumens. 32 watt, four foot long, T8 lamps emit an average of 2,800 lumens. Based on this data five individual lamps could be eliminated if the T12 fixtures were changed to T8. The savings in electricity usage would be minimal. Also, the cost per lamp would increase. A T12 lamp costs about \$1.25 per lamp. A T8 lamp costs about \$1.68 per lamp.

Currently, we do not recommend replacing your T12 fixtures with T8 fixtures. In time, T8 lamps may be more cost efficient. At that point, changing would be a good idea.

Air Filters and Indoor Coils

- The pictures to the right reveal two issues. The filter has been pulled against the coil of this air handler. This is a result of an undersized return air intake. Also, if the filter is misshaped due to high speed airflow, it is not able to capture dust very well. Evidence of this can be seen in both pictures. The coil in this air handler is completely clogged around its perimeter. A clogged coil causes a unit to operate inefficiently due to reduced airflow. This particular unit serves the library. As your units are serviced over time, ensure the technician cleans any dirty coils he finds.
- Consider using pleated filters with a Minimum Efficiency Reporting Value (MERV) of eight. Most brands use the MERV scale. Other brands, such as 3M - Filtrete use the Microparticle Performance Rating (MPR) system to rate its filters. If you purchase filters that use this scale, buy ones with MPRs of 300. Either filter will allow proper airflow while filtering the air much more effectively.



BUILDING LEAKAGE TEST Page 2

Date of Test: 12/15/2011 Test File: 1971-3610-1

Building Conditions

Inside Temperature:	69 deg F	Heating Fuel:	Heat Pump
Outside Temperature:	47 deg F	Heating Fuel Cost:	\$0.072/kwh
# of Stories	2.0	HSPF:	8.00
		Heating Degree Days:	4638
Wind Shield:	M	Cooling Fuel Cost:	\$0.072/kwh
# of Occupants	2.0	Cooling SEER:	13.0
		Cooling Degree Days:	733
# of Bedrooms:	4.0		
Volume:	40000 ft3	Ventilation Weather Factor:	0.95
Surface Area:		Energy Climate Factor:	20.0
Floor Area:	4000 ft2		
Design Winter Wind Speed:	11.0 mph	Design Winter Temp Diff:	61 deg F
Design Summer Wind Speed:	7.0 mph	Design Summer Temp Diff:	18 deg F

Comments

General Data

- main level with basement
- heat pumps - 6 tons total, 13 SEER
- 2 ventless propane fireplaces

Recommendations

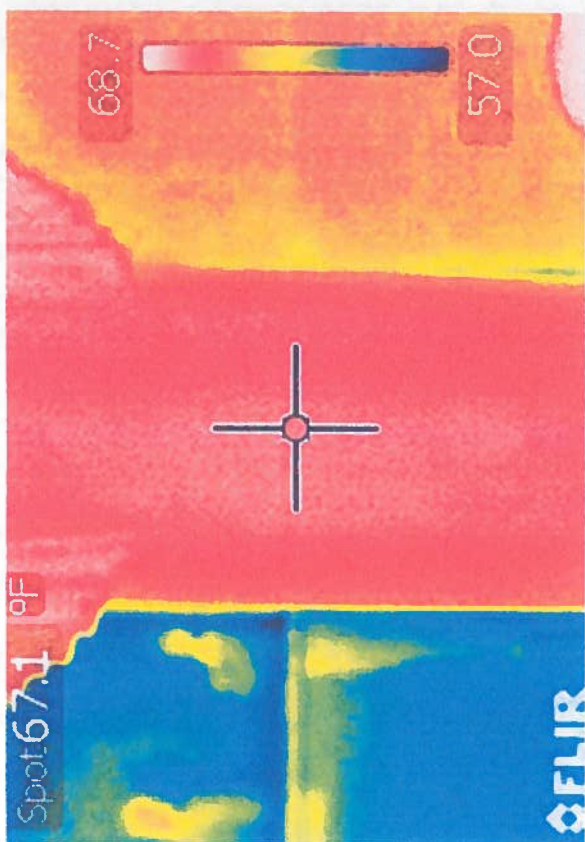
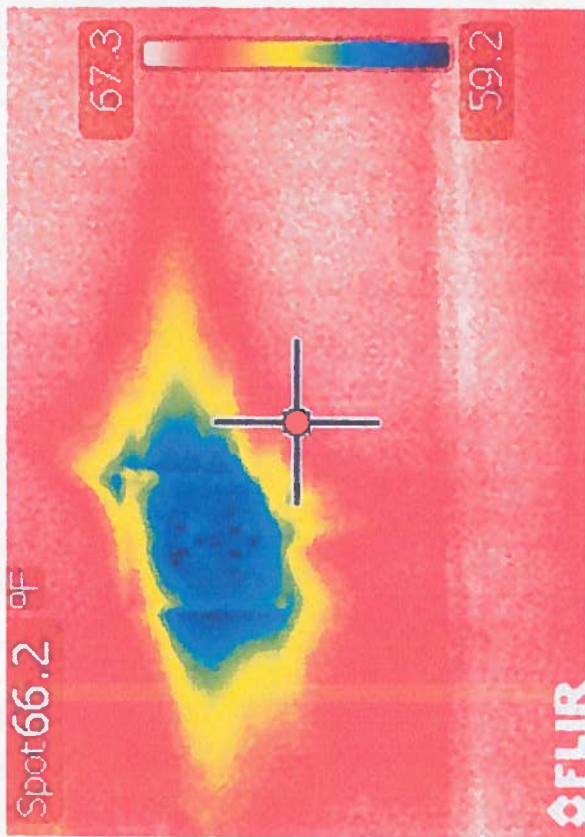
- Install foam gaskets behind all receptacles and light switches.
- Seal around recessed lights with silicone caulk.
- Weatherstrip doors and windows as needed.
- Use window coverings as much as possible.
- Insulate the small knee walls in the master bathroom.
- Seal the threshold of the door leading to the garage.
- Seal around plumbing penetrations.
- Seal around lighting fixtures.
- Caulk where the basement wall meets the concrete floor below the front porch.

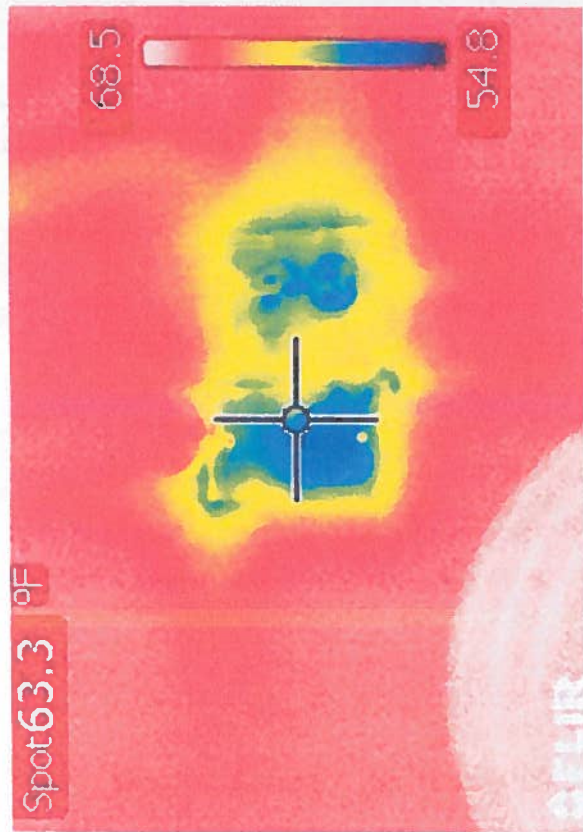
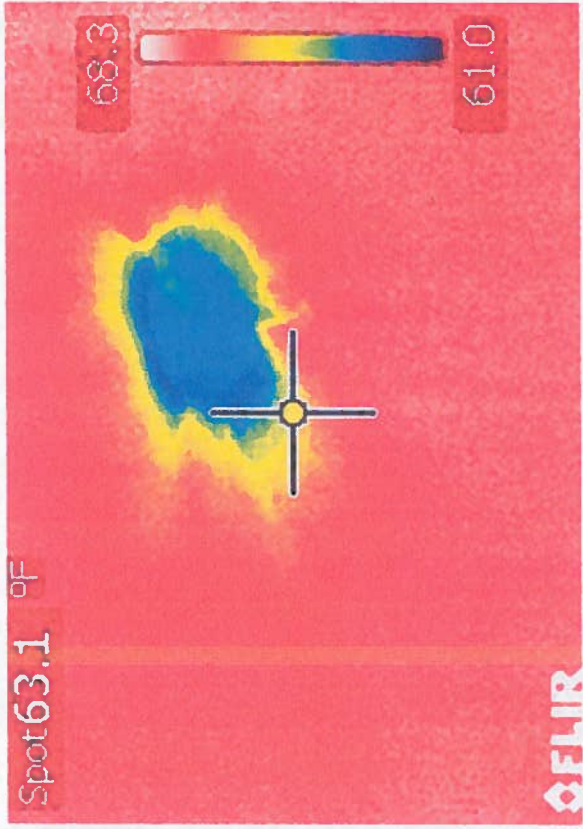
BUILDING LEAKAGE TEST Page 3

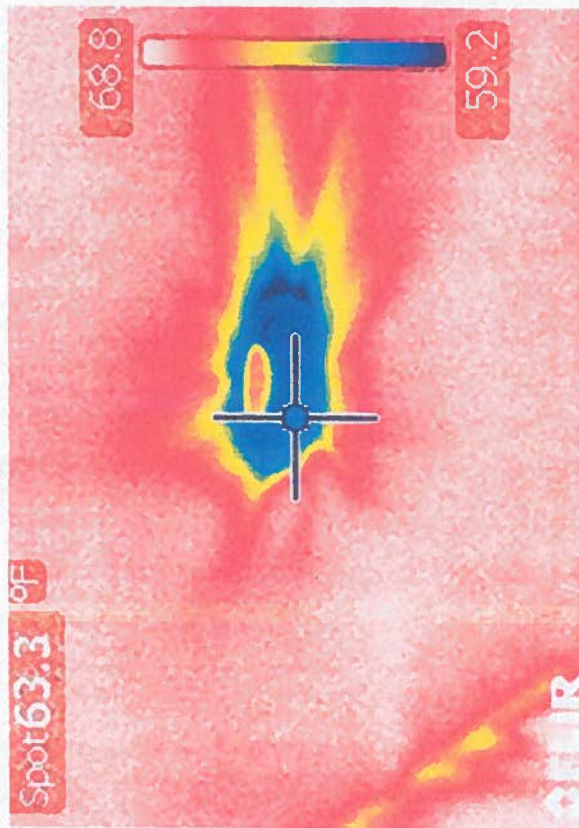
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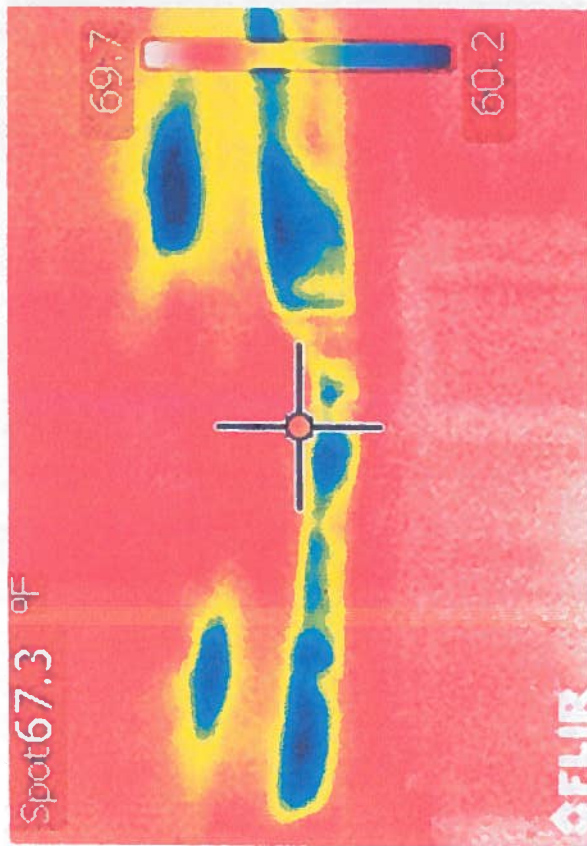
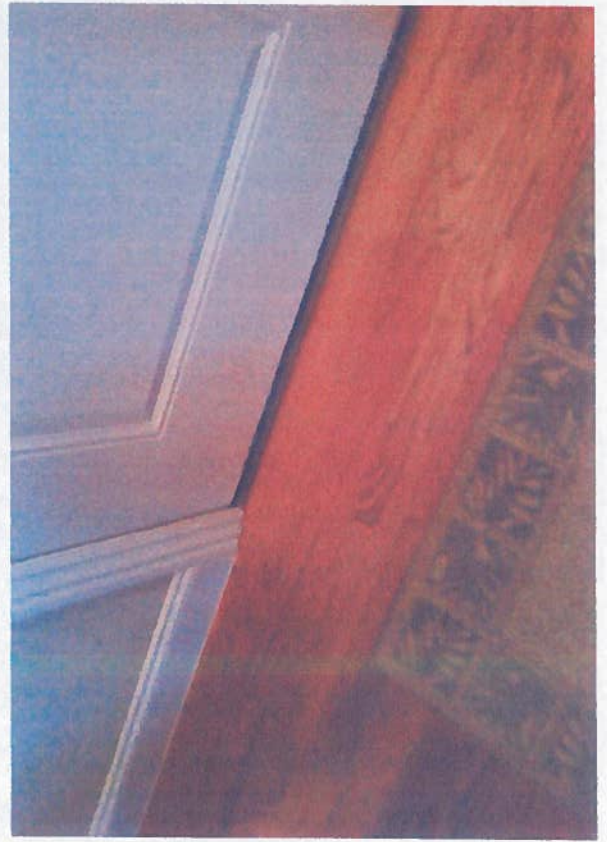
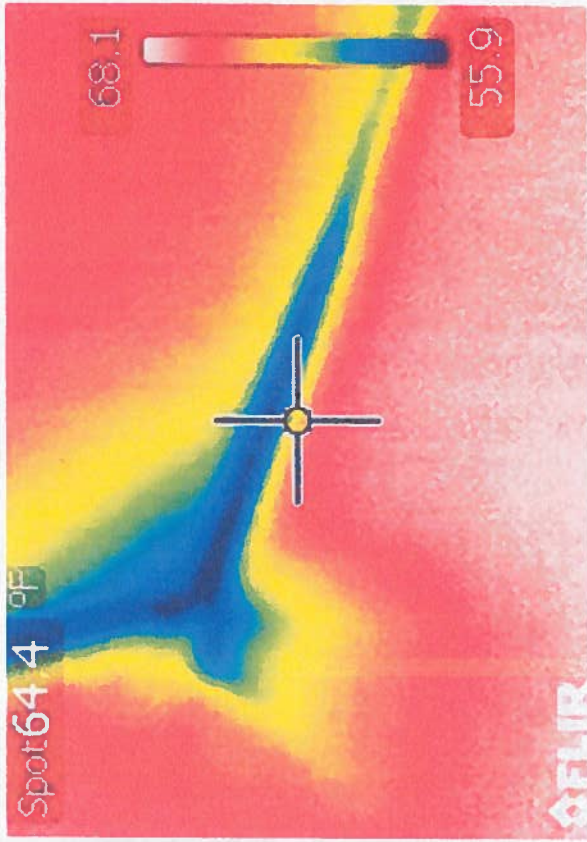
Data Points:

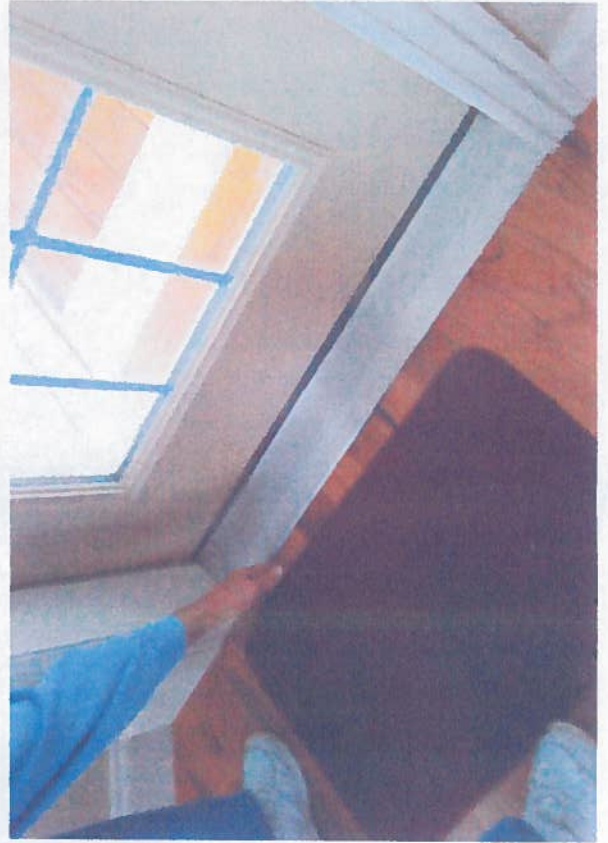
Nominal Building Pressure (Pa)	Fan Pressure (Pa)	Nominal Flow	Temperature Adjusted Flow	% Error	Fan Configuration	Baseline Std Dev (Pa)
-1.5	n/a					+/- 0.20
-51.2	118.2	1948	1907	0.4	Ring A	
-46.6	104.5	1834	1796	0.3	Ring A	
-41.3	88.4	1690	1655	-0.0	Ring A	
-37.6	75.2	1562	1530	-1.9	Ring A	
-29.3	57.2	1368	1339	0.9	Ring A	
-26.1	48.0	1255	1228	-0.2	Ring A	
-21.1	37.0	1106	1083	1.1	Ring A	
-16.6	25.8	928	909	-0.5	Ring A	
-1.0	n/a					











- **Heating and Cooling Load Calculations**

At the member's request, heating and cooling load calculations are performed on new or existing homes. Load calculations allow us to advise the member of their structures' wintertime heat loss and summertime heat gain in British Thermal Units per hour (Btuh). The necessary data to perform the calculation is often gathered on site but can be obtained from architectural drawings. The collected data is input into RHVAC Software. Presently, we use a program by Elite Software Development Inc.

The calculation process allows for various scenarios of thermal improvements and/or changes in efficiency of heating and cooling equipment. When these calculations have been prepared, we try to deliver the results in person and explain the economic pay-backs of the various choices detailed in the calculation. (See pages 27-35)

- **Points of discussion**

- ◆ Thermal envelope of building
- ◆ Air infiltration rate of building
- ◆ Energy efficiency of HVAC equipment
- ◆ Proper duct design
 - Locations (pros and cons of the following): In attic, crawlspace, conditioned space
 - Insulation
 - Air tightness
 - Sized for correct air distribution/comfort
- ◆ Location of outdoor unit
 - For optimum heat transfer
 - For unrestricted air circulation
- ◆ Equipment dealer qualifications/considerations
 - Reputation and references
 - Written bid with model number of indoor and outdoor equipment to verify A.R.I. tested sets of equipment
 - Proposal to include all charges such as:
 - Taxes
 - Disposal fee
 - Refrigerant reclaim fee
 - Any miscellaneous fees

HVAC Load Calculations

for

Elite Software

RHVAC RESIDENTIAL
HVAC LOADS

Carroll Electric Cooperative Corp.
PO Box 4000
Berryville, AR 72616
800-432-9720

Rhvac is an ACCA approved Manual J and Manual D computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.



Project Report

General Project Information

Project Title:
 Designed By:
 Project Date: Tuesday, May 10, 2011
 Project Comment: It is recommended that the installing dealer provide a load calculation. The HVAC dealer is the one who is ultimately responsible for the unit's size, installation, and operation.

Client Name:
 Client Address:
 Client City:
 Client Phone:
 Company Name: Carroll Electric Cooperative Corp.
 Company Representative:
 Company Address: PO Box 4000
 Company City: Berryville, AR 72616
 Company Phone: 800-432-9720
 Company E-Mail Address:
 Company Website: www.carrollecc.com

Design Data

Reference City: Springfield, Missouri
 Building Orientation: Front door faces Northeast
 Daily Temperature Range: Medium
 Latitude: 37 Degrees
 Elevation: 1268 ft.
 Altitude Factor: 0.955
 Elevation Sensible Adj. Factor: 1.000
 Elevation Total Adj. Factor: 1.000
 Elevation Heating Adj. Factor: 1.000
 Elevation Heating Adj. Factor: 1.000

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	9	8	80%	30%	70	26.77
Summer:	95	74	38%	50%	75	31

Check Figures

Total Building Supply CFM:	1,352	CFM Per Square ft.:	1.024
Square ft. of Room Area:	1,320	Square ft. Per Ton:	513
Volume (ft ³) of Cond. Space:	10,560		

Building Loads

Total Heating Required Including Ventilation Air:	38.908 Btuh	38.908 MBH
Total Sensible Gain:	28.402 Btuh	92 %
Total Latent Gain:	2.471 Btuh	8 %
Total Cooling Required Including Ventilation Air:	30.873 Btuh	2.57 Tons (Based On Sensible + Latent)

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program.
 Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.
 All computed results are estimates as building use and weather may vary.
 Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



Miscellaneous Report

System 1 Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel Hum	Indoor Rel Hum	Indoor Dry Bulb	Grains Difference
Winter:	9	8	80%	30%	70	26.77
Summer:	95	74	38%	50%	75	30.88

Duct Sizing Inputs

	Main Trunk	Runouts
Calculate:	No	No
Use Schedule:	No	No
Roughness Factor:	0.00300	0.01000
Pressure Drop:	0.1000 in.wg./100 ft.	0.1000 in.wg./100 ft.
Minimum Velocity:	650 ft./min	450 ft./min
Maximum Velocity:	900 ft./min	750 ft./min
Minimum Height:	0 in.	0 in.
Maximum Height:	0 in.	0 in.

Outside Air Data

	Winter	Summer
Infiltration Specified:	0.450 AC/hr 79 CFM	0.230 AC/hr 40 CFM
Infiltration Actual:	0.450 AC/hr	0.230 AC/hr
Above Grade Volume:	X 10,560 Cu.ft. 4,752 Cu.ft./hr	X 10,560 Cu.ft. 2,429 Cu.ft./hr
	X 0.0167	X 0.0167
Total Building Infiltration:	79 CFM	40 CFM
Total Building Ventilation:	0 CFM	0 CFM

---System 1---

Infiltration & Ventilation Sensible Gain Multiplier: 21.01 = (1.10 X 0.955 X 20.00 Summer Temp. Difference)
 Infiltration & Ventilation Latent Gain Multiplier: 20.06 = (0.68 X 0.955 X 30.88 Grains Difference)
 Infiltration & Ventilation Sensible Loss Multiplier: 64.08 = (1.10 X 0.955 X 61.00 Winter Temp. Difference)
 Winter Infiltration Specified: 0.450 AC/hr (79 CFM), Construction: Average
 Summer Infiltration Specified: 0.230 AC/hr (40 CFM), Construction: Average

Duct Load Factor Scenarios for System 1

No.	Type	Description	Location	Attic Ceiling	Duct Leakage	Duct Insulation	Surface Area	From MDD
1	Supply	Main	Closed Crawl B	-	0.12	6	356	No
1	Return	Main	Closed Crawl B	-	0.24	6	132	No



Load Preview Report

Scope	Net Ton	ft ² /Ton	Area	Sen Gain	Lat Gain	Net Gain	Sen Loss	Sys Htg CFM	Sys Clg CFM	Sys Act CFM	Duct Size
Building	2.57	513	1,320	28,402	2,471	30,873	38,908	529	1,352	1,352	
System 1	2.57	513	1,320	28,402	2,471	30,873	38,908	529	1,352	1,352	0"
Duct Latent					750	750					
Humidification							1,376				
Zone 1			1,320	28,402	1,712	30,114	37,531	529	1,352	1,352	
1-Whole House			1,320	28,402	1,712	30,114	37,531	529	1,352	1,352	12-0"



Duct Size Preview

Room or Duct Name	Minimum Velocity	Maximum Velocity	Rough Factor	Design L/100	SP Loss	Duct Velocity	Duct Length	Htg Flow	Clg Flow	Act Flow	Duct Size
System 1											
Supply Runouts											
Zone 1											
1-Whole House	450	750	0	0.1		0		529		1,352	12-0
Other Ducts in System 1											
Supply Main Trunk	650	900	0	0.1		0		529		1,352	0

Summary

System 1
 Heating Flow: 529
 Cooling Flow: 1352



Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
1D-cv-o: Glazing-Double pane, operable window, clear, vinyl frame, u-value 0.57, SHGC 0.56	127	4,415	0	6,281	6,281
1E-cv: Glazing-Double pane window, fixed sash, clear, vinyl frame, u-value 0.56, SHGC 0.66	96.2	3,288	0	5,147	5,147
11O: Door-Metal - Polystyrene Core With Storm	26	333	0	169	169
12B-0sw: Wall-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs	713	4,219	0	2,012	2,012
12F-0sw: Wall-Frame, R-21 insulation in 2 x 6 stud cavity, no board insulation, siding finish, wood studs	176.8	701	0	233	233
CustomWall3: Wall-Custom. My third example custom wall	45	428	0	110	110
16B-11: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), Vented Attic, No Radiant Barrier, Dark Asphalt Shingles or Dark Metal, Tar and Gravel or Membrane, R-11 insulation	1320	6,522	0	5,881	5,881
19A-0cp: Floor-Over enclosed unconditioned crawl space, No insulation on exposed walls, sealed or vented space, passive, no floor insulation, carpet or hardwood	1320	8,923	0	2,926	2,926
Subtotals for structure:		28,829	0	22,759	22,759
People:	2		400	460	860
Equipment:			500	1,200	1,700
Lighting:	0			0	0
Ductwork:		3,627	759	793	1,552
Infiltration: Winter CFM: 79, Summer CFM: 40		5,075	812	851	1,663
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
AED Excursion:		0	0	2,339	2,339
Humidification (Winter) 3.75 gal/day :		1,376	0	0	0
Total Building Load Totals:		38,908	2,471	28,402	30,873

Check Figures

Total Building Supply CFM:	1,352	CFM Per Square ft.:	1.024
Square ft. of Room Area:	1,320	Square ft. Per Ton:	513
Volume (ft ³) of Cond. Space:	10,560		

Building Loads

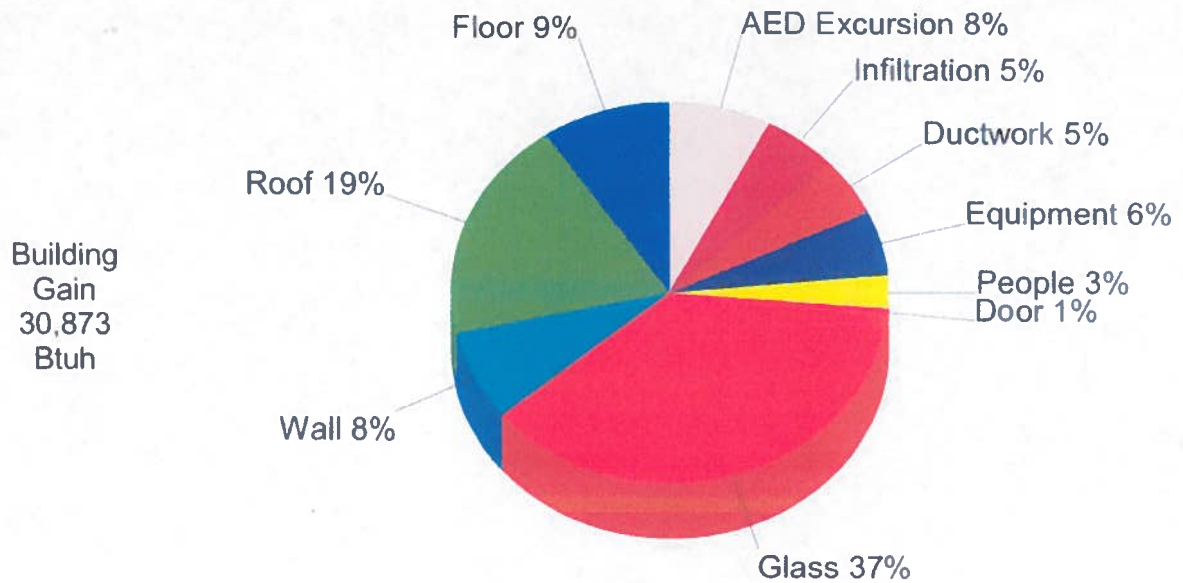
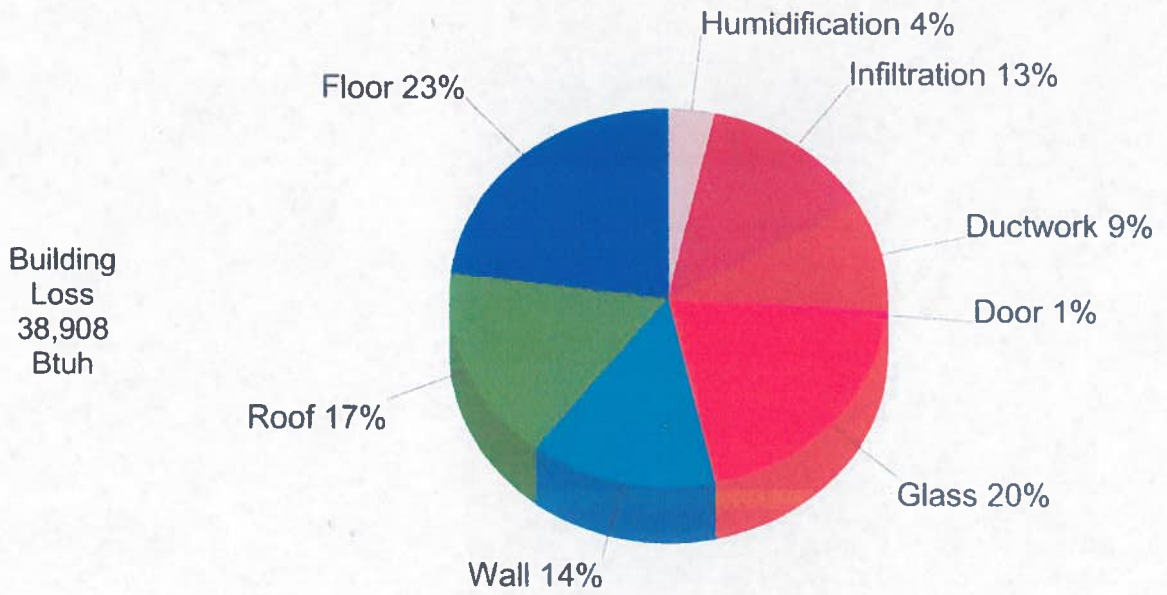
Total Heating Required Including Ventilation Air:	38,908 Btuh	38,908 MBH
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Total Cooling Required Including Ventilation Air:	30,873 Btuh	2.57 Tons (Based On Sensible + Latent)

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program. Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D. All computed results are estimates as building use and weather may vary. Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



Building Pie Chart





Detailed Room Loads - Room 1 - Whole House (Average Load Procedure)

General

Calculation Mode:	Htg. & clg.	Occurrences:	1
Room Length:	44.0 ft.	System Number:	1
Room Width:	30.0 ft.	Zone Number:	1
Area:	1,320.0 sq.ft.	Supply Air:	1,352 CFM
Ceiling Height:	8.0 ft.	Supply Air Changes:	7.7 AC/hr
Volume:	10,560.0 cu.ft.	Req. Vent. Clg:	0 CFM
Number of Registers:	12	Actual Winter Vent.:	0 CFM
Runout Air:	0 CFM	Percent of Supply:	0 %
		Actual Summer Vent.:	0 CFM
		Percent of Supply:	0 %
		Actual Winter Infil.:	79 CFM
		Actual Summer Infil.:	40 CFM

Item Description	Area Quantity	-U- Value	Htg HTM	Sen Loss	Clg HTM	Lat Gain	Sen Gain
NE-Wall-12B-0sw 44 X 8	284	0.097	5.9	1,680	2.8	0	802
NW-Wall-12B-0sw 30 X 8	110	0.097	5.9	651	2.8	0	310
SW-Wall-12B-0sw 44 X 8	319	0.097	5.9	1,888	2.8	0	900
SE-Wall-12F-0sw 30 X 6.5	176.8	0.065	4.0	701	1.3	0	233
SE-Wall-CustomWall3 30 X 1.5	45	0.156	9.5	428	2.4	0	110
NE-Door-11O 3 X 8.7	26	0.210	12.8	333	6.5	0	169
NE-Gls-1D-cv-o shgc-0.56 0%S	42	0.570	34.8	1,460	46.8	0	1,966
SE-Gls-1D-cv-o shgc-0.56 0%S	12	0.570	34.8	417	54.2	0	650
SW-Gls-1D-cv-o shgc-0.56 0%S	33	0.570	34.8	1,147	54.3	0	1,792
NW-Gls-1E-cv shgc-0.66 0%S	90	0.560	34.2	3,074	52.9	0	4,763
SE-Gls-1E-cv shgc-0.66 0%S	6.2	0.560	34.2	214	61.4	0	384
NW-Gls-1D-cv-o shgc-0.56 0%S	40	0.570	34.8	1,391	46.8	0	1,873
UP-Ceil-16B-11 44 X 30	1320	0.081	4.9	6,522	4.5	0	5,881
Floor-19A-0cp 30 X 44	1320	0.295	6.8	8,923	2.2	0	2,926
Subtotals for Structure:				28,829		0	22,759
Infil.: Win.: 79.2, Sum.: 40.5	1,184		4.286	5,075	0.719	812	851
Ductwork:				3,627			793
AED Excursion:							2,339
People: 200 lat/per, 230 sen/per:	2					400	460
Equipment:						500	1,200
Room Totals:				37,531		1,712	28,402



System 1 Room Load Summary

Room No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
1	Whole House	1,320	37,531	529	12-0	0	28,402	1,712	1,352	1,352
	Humidification		1,376							
	Duct Latent							759		
	System 1 total	1,320	38,908	529			28,402	2,471	1,352	1,352

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	2.57	92% / 8%	28,402	2,471	30,873

Equipment Data

	Heating System	Cooling System
Type:	Natural Gas Furnace	Standard Air Conditioner
Model:		
Indoor Model:		
Brand:		
Efficiency:	0 AFUE	0 SEER
Sound:		
Capacity:	0	0
Sensible Capacity:	n/a	0 Btuh
Latent Capacity:	n/a	0 Btuh

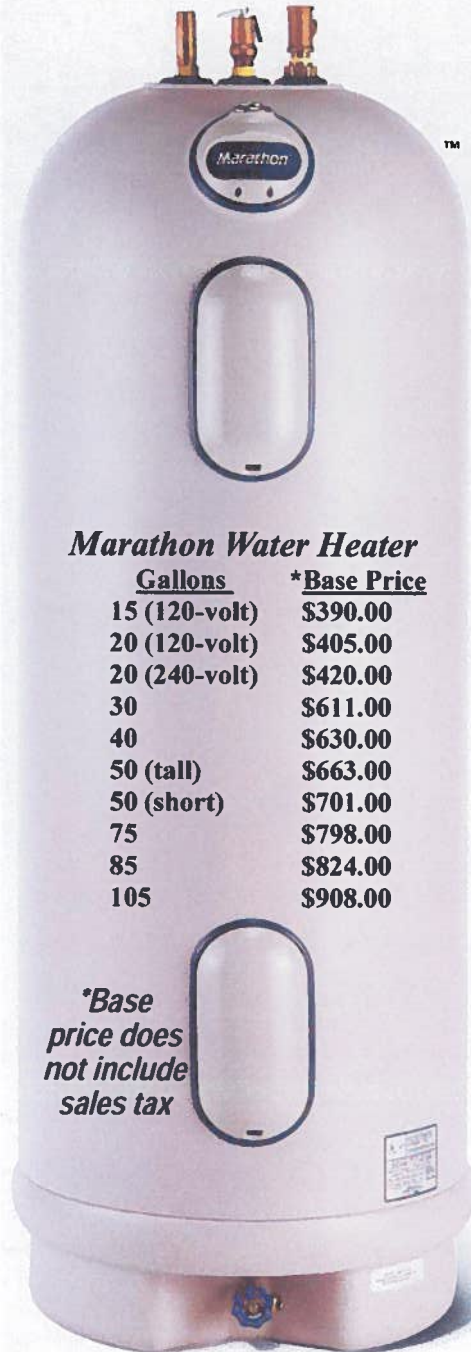
- **Water Heater Evaluations**

We routinely entertain many questions regarding water heaters. This provides us with the opportunity to advise our members regarding ways to reduce energy consumption used in heating water...such as reducing tank temperature, ways to reduce the volume of hot water consumed, insulation of hot water lines, possible addition of more insulation to the water heater, preferred water heater locations, and the potential high energy consumption caused by hot water circulation systems.

Carroll Electric Cooperative sold 74 Marathon Water Heaters in 2011—resulting in total energy savings of approximately \$740 annually for our members.

Though we sell these as a retail item, we price them at our cost to increase the affordability to our member.

Shown is a Marathon Water Heater price list and brochure.

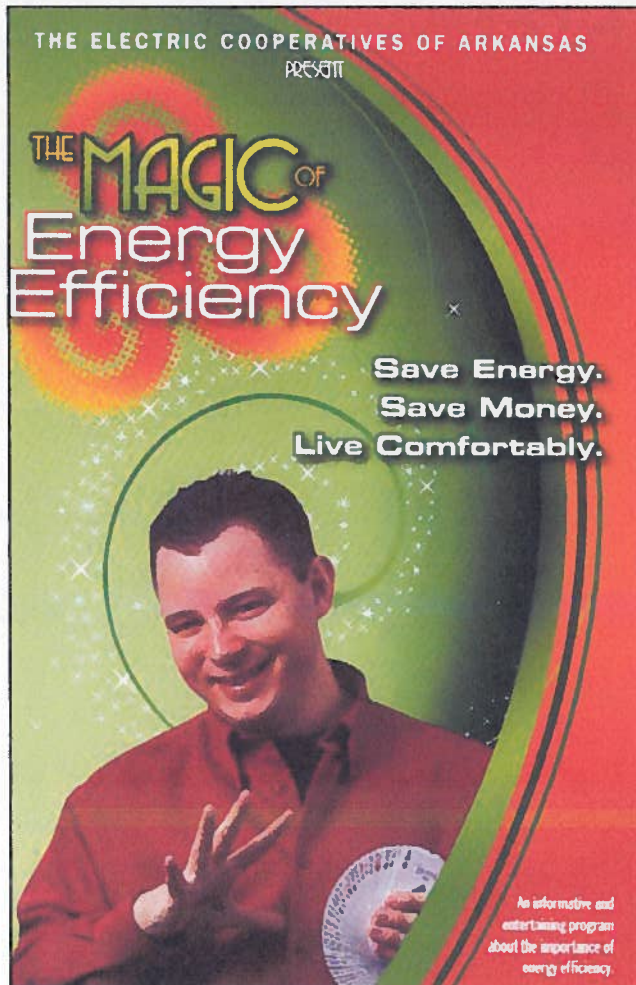


- **Member Education**

Carroll Electric Cooperative embraces every opportunity to educate its members about energy efficiency and conservation. Aside from the before-mentioned informal education provided by Carroll Electric Cooperative employees, we provide a number of formal educational opportunities to our members.

- ◆ **School, Community, and Civic Club Events/Presentations**

- In 2011, Carroll Electric's member services representatives participated in 20 events/presentations pertaining to energy conservation. Labor cost was approximately \$6,058 and transportation cost was \$2,541 (an average of \$1.59 per mile), for a total cost of \$8,599.
- Magician, Scott Davis, performed 25 presentations to approximately 5,633 students promoting energy efficiency/safety in local elementary schools in Carroll Electric service areas. Labor cost was approximately \$3,066 and transportation cost was \$1,796 (an average of \$1.86 per mile), for a total cost of \$4,862.



Scott Davis,
Magician,
promoting
Energy Efficiency

◆ **Media Communications**

- **Beyond the Lines—Carroll Electric's Newsletter**—Each newsletter was filled with pertinent information about energy tips and services and inserted with the member's monthly bill. Energy Efficiency articles follow. Of the total production and labor cost, \$6,229 was attributed to energy efficiency.



Members Beware!

Imagine being offered a device that would save 10 - 50 percent on your electricity bills. Some companies are claiming their products can do just that. These devices come in various shapes and colors but all make the same basic claims: to improve power factor in your home.

Power factor discussions can get deep in a hurry but the basic concept is... the measure of how smoothly or efficiently electricity flows through your home. The good news is...good or bad power factor is not a consideration for billing of residential members. Therefore, regardless of the claims, such devices will not reduce your electric bill! Arkansas Electric Cooperative Corporation (AECC), conducted tests on these products and found repeatedly, they do not reduce kilowatt-hour usage, which is how residential members are billed. The engineers and energy specialists at Carroll

Electric agree; these devices will not lower your electricity bill.

Call Carroll Electric to schedule a free energy audit or building leakage test to gain real energy-saving knowledge. Remember, Carroll Electric does not perform telemarketing or door-to-door sales and all Carroll Electric employees carry identification. If you are suspicious of a caller or visitor, we advise you to ask the person for identification before listening to their offer. Or better yet, call Carroll Electric for advice on energy-saving products and services.

Caulking, insulation, and clean air filters may not look as fancy as these magic boxes, but they do have one thing going for them... they work!



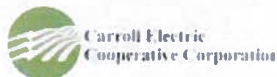
Energy Tip



Switch to energy-saving halogen incandescent light bulbs to cut lighting energy use by 25%. These bulbs last three times longer than traditional incandescent bulbs and can easily be dimmed. Want to save more? Compact fluorescent lamps (CFLs) and light-emitting diodes (LEDs) cut lighting energy use by at least 75%. Learn more at:

www.energysavers.gov.

For the next 12 months, any member enrolled in automatic bank draft is eligible to win \$50! You remain eligible each month you are enrolled in this free and convenient payment service. Winners will be posted on: www.carrollecc.com. Members already enrolled are automatically eligible to win. One prize per member



920 Hwy. 62 Spur
P.O. Box 4000
Berryville, AR 72616

1-800-432-9720
www.carrollecc.com

Energy Tip

Can you see light around any of your doors?

If you answered yes, you are letting air flow in and out of your home, increasing heating and cooling costs. Stop door air leaks with weather stripping. Take measurements and visit your local hardware store. Most retailers have helpful associates who can offer advice on the proper types of weather stripping for your particular doors and windows. Seal those leaks and stop letting money sneak out of your home.



920 Hwy. 62 Spur
P.O. Box 4000
Berryville, AR 72616

1-800-432-9720
www.carrollecc.com

What's Your EQ

1

What is the recommended water heater setting to reduce your bill and keep the water hot?

- 125 degrees
- 135 degrees
- 140 degrees

2

The cost of heating water typically amounts to what percent of your utility bill?

- 5 - 10 %
- 15 - 20 %
- 25 - 30 %

Answers:
1. 125 degrees: Efficiency will be better if the water heater is installed in a conditioned space. Water heater blankets will help increase efficiency if the water heater is in an unconditioned space.
2. 15 - 20%: To reduce your water heating bill 3-5%, turn the thermostat down to 125 degrees.



920 Hwy. 62 Spur
P.O. Box 4000
Berryville, AR 72616

1-800-432-9720

Beyond the lines

Carroll Electric exists to serve our members with safe, reliable, and convenient electricity at the lowest possible cost.

Why doesn't my electric bill go down when I'm on vacation?

This is a common question. Many people believe when they are away from home for one week, two weeks, or longer, their electric usage stops or significantly goes down. Not true in most cases. A vacant house can use as much, or more, energy than an occupied home. Appliances such as refrigerators, freezers, electric water heaters, instant-on televisions, chargers, and electronic sound systems to name a few, will continue to use electricity whether or not someone is there to enjoy them. If left on, central air conditioners (and window units, too) will also continue to maintain the air temperature inside the home.



To save energy and dollars while on vacation, pay the most attention to the largest energy consumer in the home...the **cooling system**. Each degree the thermostat is raised will mean it runs less, reducing electric usage. While on vacation, Carroll Electric recommends a setting of 82-85 degrees Fahrenheit unless higher humidity issues are a concern for the homeowner. Raising it higher yet, will save even more money.

An electric **water heater** typically uses 15-20% of a home's total monthly electric usage. While away, the heater will continue to heat the water and maintain it at the selected temperature. Carroll Electric suggests choosing a lower temperature setting, the "vacation" setting, or turning off the breaker to the water heater when leaving home for more than two days. When returning from a family vacation, it's not uncommon to have lots of laundry to do. Turn the hot water heater setting back to normal and try to use a cold-water setting on the washing machine to allow the water to heat again.

Those "**phantom**" **electricity** users such as standby electronics, instant-on televisions, and programmable coffee makers can add up quickly. Even when the unit is not on, they draw electric current. It is suggested to connect this type of equipment to a smart power strip and turn it off when these appliances will not be used for an extended period of time.

Hot summer days = Higher electric bills

Should you find yourself in a pinch to pay your entire electric bill, call the Customer Service Center to discuss your options before your bill becomes due.

We're here to help! 800-432-9720

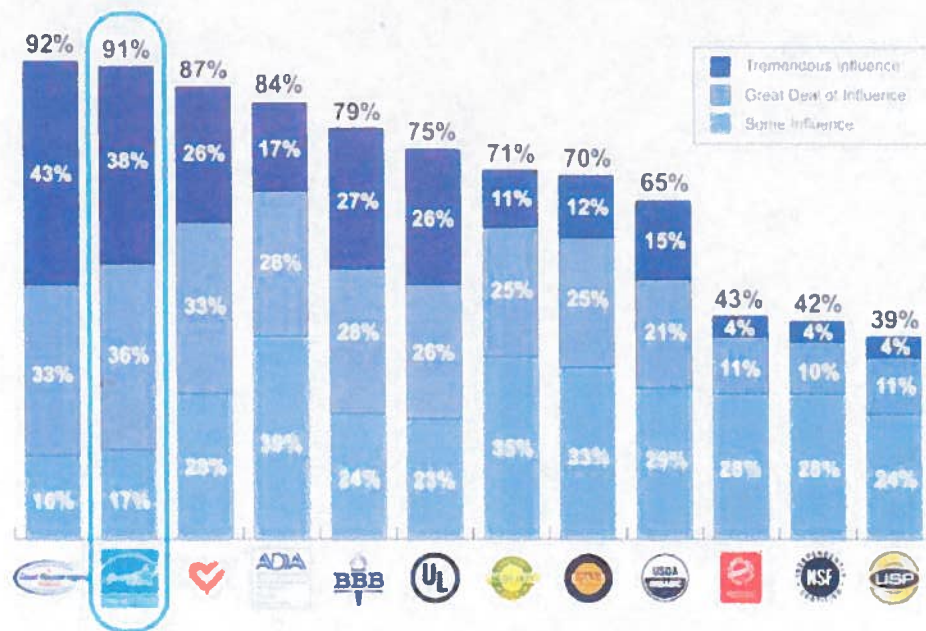
Have fun on that family vacation but before leaving, take appropriate measures to ensure the electric meter also gets a vacation.

ENERGY STAR and Carroll Electric – A Perfect Partnership

Carroll Electric has always been committed to educating you on the benefits of purchasing and using energy efficient products. Now, as an ENERGY STAR Partner, we are even more enthusiastic about this commitment. ENERGY STAR products have earned the U.S. government-backed symbol of energy efficiency. Teaching you more about using less (energy) is just one of the many benefits of being a member of Carroll Electric.

It's interesting in a 2009 consumer research project, the ENERGY STAR mark ranked among the highest level of influence on product purchases among all consumer emblems, similar in ranking to the Good Housekeeping Seal. The best part...you are the beneficiaries of this program by saving money, saving energy, and saving the environment!

Always look for the ENERGY STAR emblem when purchasing new products. Together, we can promote the best practices toward energy efficiency and energy conservation. To learn more about ENERGY STAR, go to www.carrollecc.com or www.energystar.gov.



- **Arkansas Living Magazine**—*Arkansas Living* magazine is provided to every member of Carroll Electric Cooperative. It is an excellent media to educate our members. CECC paid \$299,998 for the publishing and delivery plus an additional \$11,640 for in-office pre-production cost. Thirty-five percent (\$109,073) of the combined costs listed above was dedicated to energy efficiency communication.

Predictions for 2011

In 2011, someone served by Carroll Electric will:

- ◆ need a complete replacement of their heating and cooling system.
- ◆ make the right choice by installing a geothermal heat pump.
- ◆ have fewer worries about their utility bills than last year.

Geothermal energy—created from Earth’s natural heat—has been used by many cultures for thousands of years to cook and bathe. Five feet below the surface the earth remains a relatively constant 50 to 60 degrees Fahrenheit temperature year-round. Geothermal heat pumps rely on this temperature to move heat into and out of a home, providing winter heating and summer cooling. Also called ground-source heat pumps, these systems come in two types: a groundwater (open-loop) system uses well water; an earth-coupled (closed-loop) model moves a water and antifreeze solution through underground pipes to disperse heat during air conditioning season and gather heat during the heating season.

Install a geothermal heat pump and:

- get **free** hot water during the summer.
- save up to **50 percent** of heating costs.
- save up to **75 percent** of cooling costs.
- have **minimal** maintenance costs.



While geothermal heat pumps operate more efficiently than their air-source cousins, the upfront purchase and installation are more expensive. However, a federal tax credit equal to 30 percent of the cost for materials and installation, with no limit on total project expenses, applies to geothermal heat pumps through Dec. 31, 2016.

A full list of geothermal heat pump requirements, along with a product list, can be found at www.energystar.gov. To see if other rebates are available in your state, check the Database of State Incentives for Renewables and Efficiency at www.dsireusa.org.

A geothermal heat pump might not always be the best option in every situation. But then, you might just be the one who will make the 2011 predictions come true and begin to enjoy lower utility bills long into the future. Contact Carroll Electric Cooperative to determine whether a geothermal heat pump is the right choice for you.

Spring into Energy Efficiency

With Spring not far off, it's a perfect time to prepare to make small home improvements to increase energy efficiency. Here are a few tips that will save both energy and money:

1. **Seal cracks and gaps.** Do a thorough exterior inspection and consider adding weather stripping around leaky doors and caulking around window frames. It's easy to use a caulking gun to seal up leaks around vents, ductwork, and windows. A typical residential customer can save more than \$200 annually by taking this simple step.
2. **Clean the refrigerator inside and out.** Now's a good time to not only throw out that leftover fruitcake from the holidays but check the temperature settings on your refrigerator. Ideally, a refrigerator's temperature should be between 37 and 40 degrees for maximum operating efficiency. When it's time to replace that old refrigerator, be sure to buy one that's **ENERGY STAR** rated. These energy-efficient appliances can save as much as \$100 a year.
3. **Think sun block.** Pulling down the shades on your windows this spring and summer, could save about \$35 a year. Local hardware stores carry many inexpensive window coverings. Best of all, by blocking the sun, your house will stay cool and comfortable year-round.
4. **Enjoy spring breezes.** Use a clothesline during warmer months and let the natural sunlight and breezes dry your clothes. This will reduce your electric bill by not running a dryer, and add a genuine clean scent to your family's laundry.

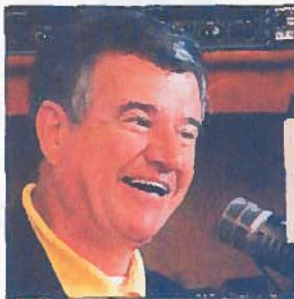


You can learn more about ways to lower your energy bill by visiting www.carrollecc.com or by calling our energy specialists at 800-432-9720.

FEBRUARY 2011

RURAL ARKANSAS LIVING | 23

CARROLL ELECTRIC
Edition



DOUG RYE

If you are building a new home, remodeling your existing home, or wanting to lower your electric bills, attend a Doug Rye energy efficiency seminar. The "King of Caulk and Talk" will whimsically teach you how to have a comfortable home with low utility bills.

Thursday, May 19 - Carroll Electric's Community Room
511 E. Court St., Jasper - 6:30 p.m.

Friday, May 20 - Holiday Island Suburban Improvement District
110 Woodsdale Dr., Holiday Island - 9:00 a.m.

Seating is limited so call 800-432-9720, ext. 1304 to register. Leave your name, telephone number, which location, and number attending. Seminars are **FREE**. Refreshments will be provided and door prizes will be given away.

Building or remodeling your home?

If so, you may want to attend a **FREE Doug Rye Seminar.**

Seating is limited so call and reserve your seat today!



- Thursday, May 19 - Carroll Electric's Community Room
511 E. Court St., Jasper - 6:30 p.m.
- Friday, May 20 - Holiday Island Suburban Improvement District
110 Woodsdale Dr., Holiday Island - 9:00 a.m.

Whether you are building, remodeling, or simply want to lower your electric bill, plan to attend one of these free seminars. Seating is limited. To reserve your place, call 800-432-9720, ext. 1304 and leave your name, telephone number, number of seats you need, and which location you'd like to attend. Refreshments will be provided and door prizes will be given away.

*The most economic kilowatt-hour is the one **NOT** used. To learn more visit carrollecc.com.*

Don't let summer electric bills cause a meltdown.

Try these energy-saving tips:

- **Adjust the thermostat.** During warmer months, set the temperature between 78-80 degrees Fahrenheit. You could save up to eight percent on monthly cooling bills. Consider a programmable thermostat.
- **Be a "fan-atic."** While they don't replace air conditioners or heat pumps, fans move air and help you feel more comfortable. On milder days, fans can save as much as 60 percent on electric bills. Fans cool people, not rooms, so turn them off when you leave the room.
- **Look for ENERGY STAR equipment.** When it's time to replace your cooling system, replace it with an ENERGY STAR-qualified model. Doing so could reduce your energy costs by as much as 30 percent. Tax credits and rebates on qualifying ENERGY STAR appliances may be available.
- **Bigger isn't always better.** Too often, cooling equipment isn't sized properly and leads to higher electric bills. A unit that's too large for your home will not cool evenly and might produce higher humidity indoors. Talk to energy efficiency experts before you purchase cooling equipment.

Long after unpacking, you'll appreciate the comfort and lower utility bills of an ENERGY STAR® qualified home. Let Carroll Electric offer energy efficiency guidance for your home.

CARROLL ELECTRIC - A NEW ENERGY STAR PARTNER

Carroll Electric is committed to educating members about energy efficiency and energy conservation. ENERGY STAR qualified products are a great way to begin using less energy!

CARROLL ELECTRIC ENERGY SPECIALISTS AVAILABLE

Carroll Electric has energy specialists available for new construction consultation, proper sizing of heating/cooling systems, as well as general energy efficiency advice. Free energy audits are offered to all members. Just call 800-432-9720.

ENERGY STAR QUALIFIED HEATING AND COOLING

High-efficiency heat pumps will keep you comfortable without breaking the bank.

ENERGY STAR QUALIFIED LIGHTING AND PRODUCTS

ENERGY STAR qualified lighting fixtures, compact fluorescent bulbs, ventilation fans, and major appliances all help you enjoy energy savings.



Save by choosing a more efficient setting on your **ENERGY STAR** appliances!

If you have an ENERGY STAR-qualified clothes washer or dishwasher, saving energy will be easier. However, you can save money even more when you become familiar with the energy efficient options and settings on your washing machine or dishwasher.



The average family washes almost 400 loads of laundry every year. An ENERGY STAR-qualified clothes washer uses one-third less electricity and one-half less water than a conventional washer, and offers a choice of efficient settings.

Reduce your energy use and save more by...

- ⇒ selecting a lower water temperature.
- ⇒ selecting a cold wash/cold rinse setting.
- ⇒ choosing a lower water level for smaller loads, also cutting your water use.
- ⇒ using the energy-saving features such as pre-soak and "suds saver" available on some ENERGY STAR clothes washers.



Much of the energy used by your dishwasher—as much as 80 percent—is used to heat the water. An ENERGY STAR-qualified dishwasher with a booster heater will let you set the temperature on your home's water heater at 120 degrees, saving energy.



Many ENERGY STAR dishwashers have efficient settings, such as "energy-saving" and "short-wash" cycles that will reduce both energy and water use. Most dishwashers have an air-drying option, which also will save on energy use.

Read the owner manuals of your appliances for specific tips on how to save energy and money, or call the member services department at 800-432-9720.

Tip of the Month...

Is your washing machine more than 10 years old? According to the U.S. Department of Energy, families can cut related energy costs by more than a third—and water costs by more than half—by purchasing a clothes washer with an ENERGY STAR label. Choose a front-load or redesigned top-load model.

Setting your heat pump thermostat for Saving\$

Our members who have an electric heat pump often ask this question, *I have been told it is better to set the thermostat at one temperature and leave it versus turning it down at night and when I'm not going to be home for several hours. What is the most energy efficient?*

Carroll Electric recommends you set and leave the thermostat as low as possible for you to be comfortable. Setting back the thermostat *can* save money by letting your house get cooler during the day when no one is home, or at night when everyone is dressed warmly. Keeping the house cooler for extended periods *will use less energy*.

Remember though, if you let the house cool down and want it to heat back up, the heat pump by itself may not be able to bring the temperature up to where you want it in a reasonable amount of time. Back-up heat strips, also called *emergency heat* or *auxiliary heat*, will automatically turn on to help out. This back-up heat operates like a toaster that is installed in the air handler unit.

The toaster (electric resistance coils) produces a lot of heat quickly and can make the house more comfortable in a short amount of time. However, when this happens a lot of electricity is used, resulting in a higher electric bill.

You may want to consider installing a programmable thermostat *specifically for heat pumps*. It is one of the quickest, easiest, and most inexpensive ways to save on energy bills year-round. A programmable thermostat...

- will cost between \$50 and \$200.
- can reduce energy costs as much as 15 percent, or about \$180 annually.
- makes saving energy easy by controlling the heating and cooling settings. It's like putting your house on "cruise control."
- should have the ENERGY STAR label. Carroll Electric is proud to be an ENERGY STAR PARTNER!

To learn more about buying and setting a programmable thermostat, call 800-432-9720 and speak with a member services' representative to determine what will work best for your home or visit TogetherWeSave.com.

Did you know...

The average household spends more than \$1,200 in heating and cooling costs.



Weatherization Assistance for *Missouri* Members at No Cost!

Weatherization assistance is available to Missouri households at no cost through a federal grant program designed to save households money, save energy, and put the local people back to work.

Heating and cooling homes are basic necessities, but can be very costly for some homes, especially older and poorly weatherized homes.

Weatherization of homes saves hard-earned cash, sometimes as much as \$430 a year. These weatherization steps often include adding insulation to walls and attics as well as weather-stripping windows and doors.

The Weatherization Assistance Program's income guidelines are:

Size of Family Unit	Income (Maximum)
1	\$21,780
2	\$29,420
3	\$37,060
4	\$44,700
5	\$52,340
6	\$59,980
7	\$67,620
8	\$75,260
Each additional member	\$7,640



Interested members whose household income during the last calendar year match the requirements should contact one of these agencies: ⇒

Members in:	Should contact:
McDonald County	Economic Security Corp. of the Southwest Area 417-781-0352
Barry County Stone County Taney County	Ozarks Area Community Action Corp. 417-865-7797

For more information about this no-cost weatherization program for Missouri residents, go to www.dnr.mo.gov/mowxworks or call 573-522-6353. Carroll Electric does not administer this program. All inquires should be made directly to the Missouri Weatherization Works Department.

Let's Talk about Space Heaters

Space heaters are small, versatile, and generally good at warming a room. However, some manufacturers claim their electric space heater can cut a home's heating bill significantly. Do these claims hold up?

Some basic facts about space heaters will help get to the truth of the matter. Space heaters work best as a *supplement* to a furnace or heat pump—they rarely are used as the primary heating source. The main types of space heaters are: radiant heaters and convection heaters.

Radiant Heaters

- Heat objects and people...not the air. Their best use is in rooms where those who want to be warmed are in the direct line of sight of the heater. They can be a good choice if you are in a room for a short period of time and want instant heat.
- Can pose a burn or fire risk and should not be placed near furniture, drapery, pets, or small children.



Convection Heaters

- Are designed to heat the air...not people or objects. Hot air from the convection heater rises to the ceiling and forces cooler air to the floor. The cooler air is warmed by the heater and rises to the ceiling, creating a cycle that continues as long as the heater is on. These typically are baseboard or oil/water-filled heaters and generally become warm to the touch.
- Have a decreased fire and burn risk.

Can using a space heater cut your home heating bill?

Maybe. Most space heaters use between 600 and 1,500 watts of electricity. A homeowner operating a 1,500-watt, *any type*, space heater (on high setting) 10 hours a day for a month would spend approximately \$33.00 for this *additional* electricity.

If multiple heaters are used...one in the well house (which likely runs continuously in very cold temperatures) and another in the basement...it's easy to see how the electric bill could be tremendously more than anticipated.

Keep in mind, space heaters can heat only a small space. Significant savings *can* be enjoyed if the thermostat of the central heating system is turned down several degrees, if the space heater is placed in the room occupied by people, *and* the room is closed off from the rest of the home. The other rooms in the home will be much cooler but this method of "zone heating" will save money.

A Better Investment

Space heaters cannot replace energy-efficient central heating or be more cost-effective than weatherization improvements to the home. Energy efficiency improvements provide long-term, year-round savings...substantially superior to saving a few dollars using space heaters. While it may be technically possible to cut your heating bill by 50% with a space heater, it is impractical for most people.

There is no single magic solution when it comes to saving energy. However, small steps can add up to big savings.

Source: Cooperative Research Network

Save money and energy by...

- buying ENERGY STAR-rated appliances.
- unplugging battery chargers and other 'vampire' electronics.
- sealing air leaks around windows and doors.
- weather stripping around doors.
- caulking around windows.
- adding insulation to your attic.
- plugging leaks in ductwork.
- regularly cleaning or replacing furnace filters.

Geothermal Heat Pump

- Get free hot water during the summer
- Save up to 50 percent of heating costs
- Save up to 75 percent of cooling costs
- Have minimal maintenance costs



Enjoy Natural Comfort

If you are thinking about replacing your heating and air conditioning unit consider one that's recommended by Mother Nature. The geothermal heat pump uses the constant temperature of the earth to keep your home cool in the summer and warm during the winter. On top of that, it can give you free hot water during the warm summer months.

Geothermal/ground source heat pumps...

- are electrically powered systems that take advantage of the earth's 58-degree ground temperature to provide cooling, heating, and hot water.
- can cut cooling and heating costs by up to 50 percent.
- last longer than conventional systems because they are protected from harsh outdoor weather. The unit is housed indoors and the loop is underground.
- have fewer mechanical components, making them more reliable and less prone to failure. The ground

loop has an expected life of more than 50 years and requires no maintenance.

- provide hot water during the summer, a free byproduct of the thermal process. In winter, the system uses the heating mode to heat a portion of your hot water.
- conserve energy. Geothermal systems...
 1. move heat that already exists rather than using an energy source to create heat.
 2. do not rely on outside air, so the air inside of buildings is cleaner and free from pollens, outdoor pollutants, mold spores, and other allergens.

A geothermal system is a simple technology that uses the earth's renewable energy to provide high-efficiency heating and cooling. Hardware consists of a heat pump connected to a series of small-diameter pipes buried underground. If you would like more information call 800-432-9720.



A Cost Comparison of Home Heating and Cooling: Annual Operating Costs*

SYSTEM	1,500 Sq. Ft.	2,500 Sq. Ft.
	Home	Home
Geothermal Heat Pump	\$386	\$644
LP Furnace and A/C	\$1,220	\$2,014
Gas Furnace and A/C	\$1,356	\$2,241
Air-Source Heat Pump	\$705	\$1,133

*Energy use data based on calculations reflecting a home of average construction and insulation R-values. Geothermal heat pump SEER 19 COP 4.5, air source heat pump SEER 13 HSPF 8, LP (propane) and natural gas AFUE 80%. Standard A/C SEER 10. Utility rates based on \$0.066 per kWh, \$1.85 per therm natural gas, \$1.25 per gallon propane.

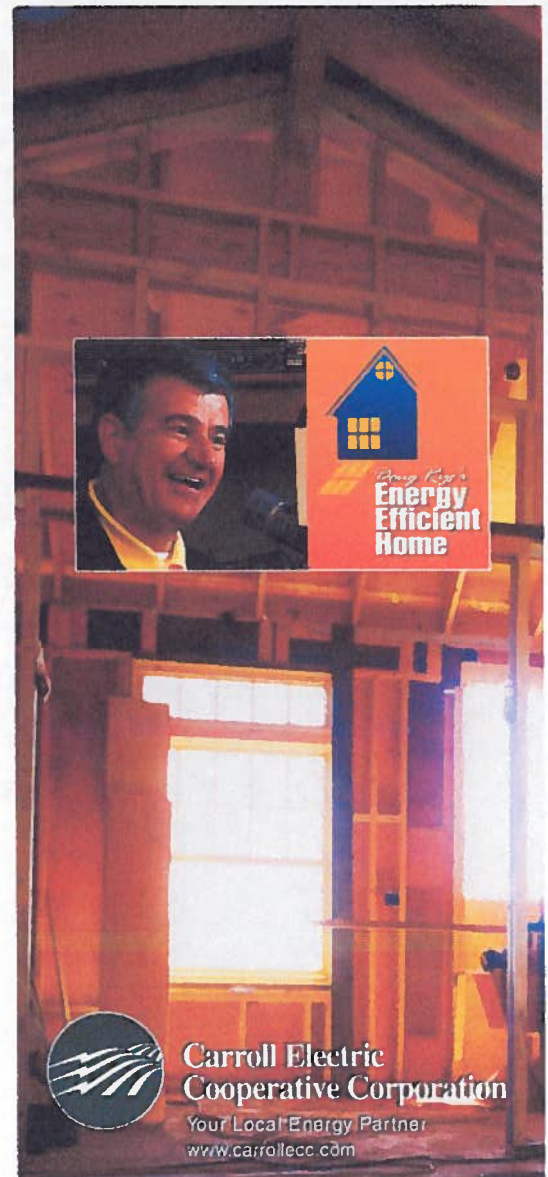
- **Radio and newspaper**—Carroll Electric promoted energy efficiency ads on various radio stations and newspapers. In 2011, approximately 25% (\$64,044) of radio and newspaper ads were promoting energy efficiency.
- **Carroll Electric Cooperative Website**—Our website (www.carrollecc.com) provides information about energy saving-tips and products. In 2011, approximately 25% of Carroll Electric’s website was directed toward energy efficiency. This amounts to \$4,122 for website maintenance for both in-office labor (\$1,622) and outside contracts (\$2,500).
- **Energy Efficiency Brochures**—Carroll Electric distributes energy efficiency brochures to our members.



◆ **Doug Rye Seminars in 2011**

Last year, Carroll Electric sponsored three Doug Rye energy-efficiency seminars for our members, one in April and two in May. Doug presented approximately three-hour seminars using props, humor, extensive knowledge in energy efficiency, question and answer sessions. Carroll Electric advertised these seminars in the *Arkansas Living* magazine, radio stations, and newspapers. Advertising, room rental, labor costs, and transportation total \$3,952. We also promote Doug Rye and his message through the below brochures, "*Home Remedies*" and "*Energy Efficient Home*."

Carroll Electric helps sponsor Doug Rye's nationally-broadcasted weekly radio program "*Home Remedies*" on various radio stations.



- ◆ **2011 Extreme Home Makeover**

In 2011, Carroll Electric participated in the statewide “Energy Efficiency Home Makeover” worth \$50,000. As a semi-finalist, a member of Carroll Electric received a free energy-efficient, 40-gallon Marathon water heater.

- **Employee Training**

- ◆ Employees attended the spring AMSA conference at Mt. Magazine and the Tri-State Conference in Hot Springs. Topics included commercial energy audits, 2011 Home Makeover update, Arkansas Electric Vehicle Rally, water heaters technology updates, and various other ways to promote energy efficiency and conservation.
- ◆ Four Carroll Electric employees completed Building Performance Institute (BPI) Analyst Training and passed the BPI Analyst Exam to complete their certification.
- ◆ Employee was secretary of the North Central HVAC Association and attended one meeting each month for nine months.
- ◆ Labor, transportation, conference registration, lodging, etc. totaled approximately \$28,997

- **Energy Efficiency Equipment**

During 2011, Carroll Electric purchased two additional infrared, thermal imaging cameras at a cost of \$16,955, making a total of four. We also utilize two building leakage/blower door testing units. This equipment enables our personnel to provide much more accurate energy conservation advice to our members.

- **Demand Reduction**

- ◆ **Load Control Switches**

Carroll Electric's voluntarily load control program for air conditioners and water heaters was implemented in 1983. The interruption of the appliance is accomplished by the transmission of FM radio signals received by a load shedding switch on the appliance. The program is designed to lower the peak demand of electricity during the summer months of June, July, August, and September. Participating members' air conditioners and/or water heaters are cycled off and on during the peak load hours which are typically from 4 to 8 o'clock in the evening. We currently have 2,252 air conditioner switches and 3,654 water heater switches.

Carroll Electric members are given a monthly credit on their summer bills for participating in the load control switch program. Members are advised to use as little electricity as possible during the peak load time frame. Due to the age of our system and technology, we are exploring more effective ways to control air conditioning and/or water heating loads.

- ◆ **Peak Alert Communications**

Contacted all our customers with valid email addresses and asked them to conserve energy and shift their load.



**Carroll Electric
Cooperative Corporation**
YOUR LOCAL ENERGY PARTNER



Powering Northwest Arkansas and Southwest Missouri since 1917

Whew, it is really hot! As a member of Carroll Electric, you've told us keeping electric rates as low as possible is important to you. Well, producing electricity can cost more on very hot days. We can meet the high demand for electricity this summer but the more we conserve, the more we save. Let's work together on this!

Here are a few energy conservation suggestions to help keep costs down and your bills lower:

- Set your cooling system thermostat at the highest level you can comfortably stand.
- Use ceiling or free-standing fans to circulate air but remember, fans cool people, not rooms, so turn them off when not needed.
- Please use major appliances like ovens, dishwashers, washing machines, and dryers early in the day or after 7:00 p.m.
- Take hot showers in the morning or late in the evening and launder your clothes using cold water to minimize the use of your electric hot water heater.
- Keep shades and curtains drawn over windows to help block sunlight.
- Turn off lights when not in use.
- And, now is a great time to check your air filter...dirty filters cause your air conditioner to work harder.

Rising temperatures will mean higher electric bills, there is simply no avoiding it. However, reducing consumption on the hotter days, especially between 2:00 p.m. and 7:00 p.m., will ultimately reduce your cost below what it would have otherwise been.

Feel free to contact one of our energy experts at 1.800.432.9720 to learn more about how to manage the heat. The beauty of being a cooperative is that we can all work together to lower the demand and cost for electricity. Be safe out there!

Nancy Plagge
Director of Corp. Communications
Carroll Electric Cooperative Corp.

- ◆ **Optional Commercial (Over 50 kW)**

Customers that are able to substantially control their load during peak demand hours are rewarded with a significant reduction in demand cost. Conversely, the penalty for electrical load during the coincident peak demand hours is a significant increase in the cost per kW.

Available to both single and three-phase services requiring more than 50 kW of measured demand:

Coincident Demand	@ \$8.58 kW
All kW Billing Demand	@ \$1.80 kW
All kWh	@ 3.369¢ / kWh

During 2011, the cooperative had 15 qualifying customers that chose to participate in this voluntary demand reduction rate. By closely monitoring their hourly usage, they voluntarily shifted their usage away from our peak demand, and shifted an estimated 17,810 kW off the peak.

- **Voluntary Contribution from the Electric Cooperative of Arkansas**

The Electric Cooperatives of Arkansas (ECA) voluntarily contributed \$112,463.35 to the Energy Efficiency Arkansas Program expenses on behalf of Carroll Electric and 16 other cooperatives. Carroll Electric's portion was \$21,560.43. This contribution represents the Electric Cooperatives' pro-rata share of program costs for the period January 1 - December 31, 2011.

Summary:

Identifiable costs associated with promoting energy efficiency:

Category	Labor	Transportation/ Equipment/ Lodging/ Registration fee	Purchased Advertising	Production Cost (Material and Supplies)	Total
Energy Audits High Bill Investigations Building Leakage Test Heating & Cooling Load Calcs. Misc. Field Visits	\$136,991	\$33,490			\$170,481
Member Education	\$19,086	\$5,184	\$67,205	\$109,406	\$200,881
Employee Training	\$18,412	\$10,585			\$28,997
Energy Efficiency Equipment		\$16,955			\$16,955
TOTAL					\$417,314

Conclusion

We encourage our members to be energy efficient by providing energy efficiency programs and information - thus helping to reduce their energy usage and our system demand. Carroll Electric Cooperative's mission statement expresses our commitment to our members: **"We exist to serve our members with safe, reliable, and convenient electricity at the lowest possible cost."**

C & L Electric Cooperative Corporation

Docket No. 08-048-RP

C & L Electric Cooperative Corporation Star City, Arkansas

2011 Energy Efficiency and Conservation Report

C & L Electric Cooperative Corporation was incorporated in 1938. Since then, C & L

Electric has been dedicated to providing safe, reliable and affordable electricity to its membership. In 2011, C & L Electric served 21,711 meters over a network of 4319 miles of service lines, in 8 counties.

C & L Electric participates in the Arkansas Energy Efficiency Education Program, Deemed Savings Survey and Energy Efficiency and Conservation APSC Reporting, at a state wide level.

Membership Education

Each member of C & L Electric receives a monthly issue of Rural Arkansas Magazine.

Every issue of the magazine provides energy savings suggestions as well as energy efficiency tips and various other conservation topics.

C & L Electric sponsors the Doug Rye national syndicated radio program, "Home Remedies" on local radio stations that can be heard throughout our service area.

Doug Rye's radio program teaches listeners how to save money by making their home more energy efficient.

At the request of a member, C & L Electric will perform an energy survey or in depth

Energy audit of the member's residence or business to identify opportunities for improving energy efficiency at that location. In 2011 C&L Energy Efficiency auditor performed 112 account phone audits, 4 Infrared camera audits & 2 Blower Door Audits.

He also conducted 8 energy efficiency classes in 7 counties to low income members seeking assistance from various agencies. He also discussed various energy efficiency topics with over 500 members. He also did 3 presentations to the local high school east lab program.

Consumer account representatives also provide energy savings tips in response to member inquiries and high bill complaints. C & L Electric provided educational information through printed pamphlets available to customers. Examples of these are Energy Efficiency in Manufactured Home, Marathon Water Heaters, Air Source Heat Pump, Geothermal Heat

Pumps, Compact Fluorescent Lamps and Green Power. Educational DVD's and coloring books for school children.

C & L Electric participated in the Doug Rye Model Home Program assisting members in constructing new homes following energy efficiency building guidelines.

C & L Electric participated in the House Utilities Permanent Subcommittee of Insurance and Commerce, discussing energy bills, assistance, leveled billing, energy efficiency and conservation.

C & L Electric participated with the Electric Cooperative of Arkansas in the Energy Efficiency Arkansas program. A total of \$112,463.35 was invested. C & L's portion was \$5,123.35.

C & L Electric participated with the Electric Cooperatives of Arkansas and Frontier Associates, LLC for the Arkansas Deemed Savings Report at a cost of \$17,307.23.

C & L Electric brought E-Business and E-Pay to its web site clelectric.com. Also added to the web site were links to Touchstone Energy savings tips, Kids Zone and other Energy Savings tips.

Load Control

C & L Electric has 62 irrigation accounts participating in the load control program.

Those who participate allow the cooperative to install a switch on their irrigation pumps that can be controlled when Arkansas Electric Cooperative Corporation is approaching a monthly demand peak. In 2011 this program had the potential to avoid approximately 1611KW of demand which resulted in a refund to members of \$24,415.00

In 2011 C & L Electric had 97 units on its TWACS AMR load control system, this would allow the cooperative to expand and better control its load control program. This was an initial investment of \$18,960.00.

Clay County Electric Cooperative Corporation

Docket No. 08-051-RP



CLAY COUNTY ELECTRIC COOPERATIVE CORP.
300 NORTH MISSOURI AVENUE ~ P.O. BOX 459
CORNING, AR 72422
Phone: 870.857.3521 ~ Fax: 870.857.3523



Clay County Electric Cooperative Corporation

2011 Energy Efficiency Programs Report

Clay County Electric Cooperative Corporation, CCECC, adheres to the seven guiding principles of cooperatives. One of those is Education, Training and Information. *Cooperatives provide education and training for their members, elected representatives, managers and employees so they can contribute effectively to the development of their cooperatives. They inform the general public, particularly young people and opinion leaders, about the nature and benefits of cooperation.* Energy Efficiency is one key area that CCECC is committed to providing education, training and informing our members, employees and general public. CCECC promotes Energy Efficiency through the distribution and resale of energy efficient products. Our members are informed and educated through the distribution of the *Arkansas Living Magazine* through our statewide office along with the distribution of our monthly newsletter *Member Matters* at each of our local offices. The general public is educated and informed through our cooperative website www.claycountyelectric.com, advertisement via television and radio, and community seminars or meetings. Following is a breakdown of activity during 2011 that further enhanced our ongoing commitment to energy efficiency to not only benefit our members but also help improve the communities we live and work in.

CCECC Website Content www.claycountyelectric.com

Apogee HomeEnergySuite

HomeEnergyCalculator

Lighting Calculator

Heat Pump Calculator

Television Calculator

Appliance Calculator

Kid's Korner

Interactive EnergyHome

Fundamentals of Electricity

Home Energy Library

Geothermal Heat Pump Systems

Power Quality

Touchstone Energy "Online Energy Audit"

Approximately 1/4 of our website is dedicated to energy efficiency



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CCECC Energy Efficient Product Promotion

CFL bulbs, surge protection, switch and outlet draft sealers, Marathon and GE GeoSpring water heaters are available for resale. GE GeoSpring and Marathon water heaters are two of the most energy efficient water heaters on the market today. CCECC sold three GeoSpring Water Heaters and 54 Marathon water heaters through our local offices in 2011.

CFL bulbs were distributed at our annual meeting. CFL bulbs, furnace filter whistles and switch/outlet draft sealers were distributed at community meetings.

CCECC Sponsors Doug Rye's Radio Show

"Home Remedies" radio show hosted by energy efficiency expert Doug Rye is aired on our local radio stations in two counties and Doug Rye also participated in our Annual Meeting to provide Energy Efficient tips to our Members.

CCECC Promotion in Schools

CCECC promoted electrical safety through safety demonstrations conducted at local schools and fire departments.

CCECC Advertisement

CCECC promotes energy efficiency through print, radio and television advertisement and educational materials. Each month all members receive the *Arkansas Living Magazine* containing many educational articles. Inside the magazine CCECC has two pages dedicated to our individual promotions. Approximately 27% of this space was dedicated to energy efficiency. Our cost for this was approximately \$11,215. We continue to distribute our monthly newsletter *Member Matters* through our offices. Each issue contains energy efficiency tips or educational articles on energy efficiency. CCECC sponsors radio advertising with an estimated 1/3 of this dedicated to energy efficiency. Our total cost for radio time in 2011 was \$10,474.50. We also collaborate with the other electric cooperatives in northeast Arkansas to have energy saving tips and energy alerts placed on our local television station. Our portion of this cost was \$4,042.80. Educational energy efficiency brochures on topics such as CFL Bulbs, Geothermal Heat Pumps, 100 Low Cost No Cost Home Energy Savings Measures, Marathon Water Heaters, GeoSpring Water Heaters and Air Source Heat Pumps are distributed in our office lobbies, at community meetings and county fairs.



CLAY COUNTY ELECTRIC COOPERATIVE CORP.
300 NORTH MISSOURI AVENUE ~ P.O. BOX 459
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CCECC Building Energy Surveys

Energy Surveys are provided upon member's requests. The member is provided with a sheet explaining the basic kilowatts consumed by many different home appliances. CCECC uses an infrared thermometer to identify hot or cold spots inside the structure. We purchased an infrared camera to assist and improve our evaluation and have two employees certified. Our automated meter reading (AMR) system allows us to provide a graphic description of their hourly energy consumption. We provide energy saving building techniques and other efficiency information.

In 2011 CCECC conducted three Residential Surveys. In addition to the residential surveys, two small commercial surveys were completed. The small commercial surveys utilized data to assist with energy efficiency lighting upgrades while attempting to control the demand side of their billing component.

CCECC Load Control Program

We have an aggressive Load Control program on irrigation wells. During the peak months of 2011, our load management system reduced our peak load by approximately 2,980 kW with an average load reduction of 2,312 kW over the four summer months. The maximum load reduction was 5.8% of the total system KW load. At today's wholesale rate the four month average reduction would amount to approximately \$243,307 savings on the cost of power. This was an increase of approximately 17% from 2010. This reduction in load further prolongs the need for additional generation capacity.

This concludes Clay County Electric Cooperative Corporation's report on Energy Efficiency programs and practices conducted in 2011 to provide our members and the communities we live in with information about energy efficiency and practices to promote energy efficiency throughout our service territory.

Mississippi County Electric Cooperative, Inc.

Docket No. 08-046-RP

Mississippi County Electric Cooperative, Inc.
PO Box 7
Blytheville, Arkansas 72316

2011 Energy Efficiency and Conservation Report
APSC Docket No. 06-004-R

As one of the 17 members of Arkansas Electric Cooperative Corporation (AECC), Mississippi County Electric Cooperative is the smallest in number of meters and employees of the electric distribution cooperatives. However, our commitment to serve our members' needs is great and has been guided by principles and practices of sound management since our incorporation on September 28, 1938. It's a challenging but rewarding job for the employees and directors of the cooperative, who are anxious to continue to maintain the benefits of this cooperative way of life. The cooperative has been dedicated to providing safe, reliable, and affordable electricity to its membership. One of our most important goals is to remind our members that the cooperative is more than just a utility that provides electricity. The cooperative exists because of the concern and involvement of its consumer-members. One of those concerns is the efficient use of energy.

Mississippi County Electric Cooperative participates in The Arkansas Energy Efficiency Education Program, Arkansas Weatherization Program, Deemed Savings Survey, The Home Energy Efficiency Make Over and Energy Efficiency and Conservation APSC Reporting at a statewide level. Also while engaging in load control and membership education within our service area.

To accomplish our commitment to energy efficiency and conservation, Mississippi County Electric Cooperative's demand response programs fall within three categories. These categories are Direct Control – Irrigation, Commercial and Industrial Voluntary Peak Avoidance and AECC Controlled Industrial Power Service - Interruptible.

Direct Control -Irrigation

Mississippi County Electric Cooperative offers three rate options to irrigation consumer-members, 2 ½ hour and 5 hour radio controlled rates and an uncontrolled rate. The rate is designed to give the farmer a monetary incentive for allowing his irrigation equipment to be cut off during peak consumption times thus saving added demand and the necessity for building additional generating plants and ultimately lowering the cost for all members. The uncontrolled rates include a kWh charge and an annual horsepower charge. By permitting the cooperative to install a radio-controlled device on their irrigation equipment, so that the Cooperative can control the operation of the irrigation load during periods of the Cooperative's peak load conditions, the consumer-member will receive a credit per kWh of load controlled for control periods of 2 ½ hours or 5 hours for the period of June 1 to September 30. The credit cannot exceed 20% of the consumer- member's cumulative bill for 2 ½ hour credits or 40% of the consumer-member's bill for 5 hour credits for the same period before application of the credit. The credit is applied at the end of the period. In addition to the credit, the uncontrolled annual horsepower rate of

2011 MCEC - Energy Efficiency and Conservation APSC Reporting – Page #1

\$34.41 is reduced to \$24.22 for 2 ½ hour and \$14.03 for 5 hour radio control. Of the 637 irrigation accounts connected in 2011 with a load of 29,585 kW, 563 were controlled. This demand response program shed approximately 26,823 kW off of AECC's Rate-1 summer peak demand. The total savings directly benefiting the consumer-members amounted to \$2,396,688 for 2011. AECC's generation planning department estimates that the investment cost of newly constructed peaking capacity would be approximately \$800 per kilowatt. Using this data Mississippi County Electric's demand response program for irrigation saved members of the Electric Cooperatives of Arkansas \$25,106,328 in investment costs and \$1,882,974 per year in ownership, operation and maintenance expenses in 2011. None of the figures above include the cost of new load management switches purchased each year by the cooperative, or the man hours to install new switches and check existing switches to be sure they are working properly.

$$\text{Calculation} = 1.17 * 800(\text{cost}) * 26,823(\text{kW})$$

$$\text{Calculation} = 1.17 * 60(\text{expense}) * 26,823(\text{kW})$$

Commercial and Industrial Voluntary Peak Avoidance

Mississippi County Electric Cooperative offers a special rate incentive to the Commercial and Industrial consumer-member to voluntarily reduce its demand during periods when an AECC summer peak(s) is imminent. This can be accomplished by installing their own generation or by shifting their production schedule, or by a combination of the two. The cooperative has eighteen (18) Commercial and Industrial consumer-members on this voluntary rate. In 2011, the cooperative had approximately 47,799 kw that was either being voluntarily interrupted or was available for interruption through the Commercial and Industrial Voluntary Peak Avoidance program. In August 2011, the consumer-members on this rate voluntarily shed 24,636 off of AECC Rate 1 summer peak demand and saved members of the Electric Cooperatives of Arkansas \$23,059,296 in investment costs and \$1,729,447 per year in ownership, operation, and maintenance expenses.

$$\text{Calculation} = 1.17 * 800(\text{cost}) * 24,636(\text{kW})$$

$$\text{Calculation} = 1.17 * 60(\text{expense}) * 24,636(\text{kW})$$

AECC Controlled Industrial Power Service-Interruptible

Mississippi County Electric Cooperative has seven Industrial accounts where load requirements equal or exceed 5,000kW, and where the consumer-member has agreed to interrupt all or a portion of his electrical load at any time upon demand by the cooperative, with at least three hours advance verbal or electronic notice. Interruptions are called for by Mississippi County Electric Cooperative's wholesale power supplier, AECC. The consumer-member is credited \$4.56 per kW of Average Demand per month as compensation for availability of the interrupted load. In 2011, Mississippi County Electric Cooperative had approximately 481,912 kW that was either being interrupted or was available for interruption through demand response. The cooperative's demand response program for AECC Controlled Industrial Power Service-Interruptible saved members of the Electric Cooperatives of Arkansas \$451,069,632 in investment costs and \$33,830,222 per year in ownership, operation and maintenance expense.

$$\text{Calculation} = 1.17 * 800(\text{cost}) * 481,912(\text{kW})$$

$$\text{Calculation} = 1.17 * 60(\text{expense}) * 481,912(\text{kW})$$

NOTE: The 1.17 in the calculation includes a 17% reserve margin. Calculation furnished by AECC.

Membership Education

Rural Arkansas Magazine

Each member of Mississippi County Electric Cooperative is mailed a monthly issue of the Rural Arkansas Magazine, which provides informative articles with energy saving suggestions, tips, how-to guides and conservation topics that can be put to use in the member's home or business. The two pages in the center of each magazine are actually produced by the cooperative. This gives us two 8 ½ x 11 inch pages monthly to inform our own members of various items of interest to them including energy efficiency and conservation education.

Energy Survey

At the request of the member, Mississippi County Electric Cooperative will perform an energy survey of the member's residence or business to identify opportunities for improving energy efficiency that will help with lowering their energy usage.

Energy Efficiency and Conservation Information

Qualified member service representatives provide energy saving tips in response to member inquiries and high bill complaints. Member service representatives will also consult with members to further the member's understanding of energy efficiency and conservation measures. The cooperative keeps printed material readily available on the front counter and in magazine racks in our foyer for easy access by the member. There is also a message area on the electric bill that is used as a brief reminder to the member to change their A/C filters and other information. This material is free of charge.

Web Site – www.mceci.com

We have combined all of our energy efficiency resources from Touchstone Energy Saver tools and Doug Rye Home Remedies to our Green Power program in one useful page accessible from the home page of our website. Members who want to learn more about how they can save money on energy costs can click and read more. The Touchstone Energy Saver Tools include an Energy Savings Home Tour, Light Bulb Energy Saver with a CFL calculator, Water Heaters Saver, Home Energy Saver Audit with calculator, Home Energy Savings Guide, Seal the Deal, Heating and Cooling Savings and a Commercial Energy Savings Guide. There are also many links throughout the website including the Touchstone Energy Kids Zone, Arkansas Public Service Commission, Department of Energy Efficiency & Renewable Energy, Department of Energy Information Administration and many more. The cost for hosting and maintaining our website not including employee time and overhead was \$10,000.

New Home Construction Guidelines

Mississippi County Electric Cooperative assists members who are building a new home with energy efficiency building guidelines.

Marathon Water Heater Sales

Mississippi County Electric Cooperative began its' Marathon Water Heater Program because we believe it to be the most energy efficient water heater on the market. Because it is the most energy efficient water heater on the market, they are also expensive and there are not too many retail stores that stock them. For that reason, we decided to stock them at the cooperative and sell them to the public. Cooperative members can have the price of the water heater added to their electric bill in six installments over a six month period. We believe this service provides a way for our members to have access to this energy efficient model water heater they may not have had if they had to pay the full price upon purchase.

Electric Cooperatives of Northeast Arkansas

Mississippi County Electric, Clay County Electric, Craighead Electric, North Arkansas Electric and Woodruff Electric Cooperatives joined together to purchase internet, radio, television and print ads to relay a variety of messages related to the cooperatives including energy efficiency, conservation and safety. One of the sponsorships is of the Energy Alert on KAIT-TV which reminds area viewers that peak energy consumption conditions are approaching. The amount spent on this advertising varies annually and is divided between the members of the Electric Cooperatives of Northeast Arkansas by number of meters served.

Scott Davis Magic

Scott Davis Magic show has presented at numerous area schools and civic organizations in Mississippi County Electric Cooperative's service area. Davis adds humor as he brings a message of safety, energy efficiency and conservation to elementary students and adults alike.

Our Commitment

Mississippi County Electric Cooperative is committed to providing safe, reliable, efficient and affordable electric power to each of its members. This isn't something new. We have been educating our members on the value of energy efficiency and conservation for many years. We have a vested interest since we are owned by the consumers we serve and because we are guided by a set of seven principles that reflect the best interests of those consumers. They also share in profits the cooperative makes in the form of capital credits, they are in a since our shareholders. They elect the directors who are responsible for making the decisions that directly affect the cooperative.

Energy Efficiency and Conservation APSC Reporting

We will be reporting at regular specified intervals to the APSC on programs designed to provide our members with information about energy efficiency and conservation, and our practices to promote energy efficiency and conservation throughout our service area.

Ozarks Electric Cooperative Corporation

Docket No. 08-041-RP



Ozarks Electric Cooperative

A Touchstone Energy® Cooperative 

Energy Efficiency 2011 Program Summary

Contact Info:

Keith Kaderly
Manager of Marketing/Energy Services
P.O. Box 848
Fayetteville AR 72702
Phone: 479-521-2900

**Summary of '10 Energy Efficiency Programs
Ozarks Electric Cooperative Corporation**

Residential Energy Efficiency Programs

- **Model Home Program**

In 2011 Ozarks Electric Cooperative Corp. (OECC) partnered with a local builder, Cobblestone Homes, to assist in the construction of an extremely energy efficient home. This home was displayed during the Northwest AR parade of homes and in the course of a week 1,225 people visited the home. This home included technologies such as: Real time energy monitoring, high efficiency Heat Pump, Hybrid heat pump water heater, Tri level insulation (reflective, foam and cellulose), architecturally designed energy efficiency, and energy efficient lighting. (see attachment A1 for costs)

- **Energy Efficiency Loans**

These loans are designed to help promote the installation of energy efficient heat pumps through no money down fixed rate loans. Members can include any energy efficient upgrades to the home, these upgrades can include, but not limited to, water heaters, windows, insulation etc. These loans are a fixed term for 7 years and the interest rate usually ranges from 6.5%-8.5%. (see attachment A1)

- **Doug Rye Energy Efficiency Seminars**

Doug Rye has been a major part of our energy efficiency program for many years. His Saturday morning radio show is broadcast in over 28 states and he is a national spokesman for building energy efficient homes. OECC has based their energy efficient home building program around Mr. Rye's approach to home building. OECC hosts energy efficiency seminars held by Mr. Rye once a year. (see attachment A1)

- **Energy efficient presentations to local civic clubs**

Each year OECC does several educational seminars to local civic clubs and organizations. These presentations are usually less than 45 minutes long and consist of energy saving tips. (see attachment A1)

- **Energy Efficient Marathon Water Heaters**

OECC is the only supplier, in our area, of Marathon water heaters. This high efficiency water heater has a lifetime warranty and is the most efficient electric water heater on the market. We sell these units at cost to our membership. In 2011 OECC distributed 57 energy efficient Marathon water heaters to our membership.

- **HVAC Load Calculations**

Detailed load calculations and proper sizing of heat pump equipment is vital to the proper function of energy efficient heat pumps. If the total heat gain/ loss of a home is not correct, then the HVAC (Heating Ventilation and Air Conditioning) unit can be either over sized or undersized, both having major consequences on the comfort of the home. These two factors also influence the efficiency of the HVAC unit. We offer this service free of charge to our membership to encourage proper sizing of HVAC units. We have also offered load calculation training to HVAC dealers and other cooperatives across the state. (see attachment A1)

- **Complete Energy Audit (Blower Door Testing and Thermography study)**

OECC's complete energy audit program is one of the first comprehensive energy audits offered by a utility. It utilizes blower door, duct blaster, theatrical fog and infrared testing equipment to determine heating and cooling lose in existing home structures. Using these testing technologies OECC's energy auditor can diagnose structural deficiencies in a home or building that lead to high energy consumption. These technologies produce a tactile and visual reference to aid in the explanation of opportunities to save on home utility bills. An initial cost of the Complete Energy Audit is \$100. Reimbursement will be made to the member upon presentation of paid receipts for energy improvements and will be limited to \$100. With every energy audit completed free CFL's are distributed to the member. (see attachment A1, A2, A4, A6)

- **Basic Energy Audit**

This free service is offered to any member that requests it. Our basic energy audit is simply a walk through of the home with general suggestions for obvious fixes to reduce energy usage. Typically this process is started because a member feels his/her bill is too high and wants help in reducing their overall usage. (see attachments A1 and A6)

- **Poultry LED promotion**

In 2010 Ozarks Electric gave 750 LED poultry specific lamps to every poultry farmer in our service territory. As a result of this campaign distributors are reporting approximately 16,000 lamps installed in area poultry houses. (See attachments A1, and A6)

Demand Response Management

- **Off Peak Rates**

OECC has filed with the commission off peak rates that encourage the reduction of kW demand during peak times. These rates are designed for commercial and

industrial accounts and have been very effective at reducing total system demand.
(see attachment B1)

- **Voltage Reduction**

OECC has utilized voltage reduction to effectively lower the overall system peak. This reduction in voltage does not affect the end user and lowers total system consumption. We estimate that this process has avoided 4 MW directly of peak load (see attachment B1).

2011 Demand Response Survey

Name of Load (Commercial)	Delivery Point	Maximum Demand	Estimated KW Controlled
Cargill	E. Fayetteville	8,050	7,200
OMI - East Side WWTP	E. Fayetteville	1,440	1,100
Rogers Group (Rock Crusher)	E. Fayetteville	636	0
Richland Handle (handle mill)	E. Fayetteville	82	48
SWF Inc (Handle Mill)	E. Fayetteville	121	5
Flynt & Son (moldings mill)	Elm Springs	309	108
OMI - West Side WWTP	Farmington	1,032	750
City of Fayetteville sewer lift	Farmington	825	140
CSI Corrugated (paper recycler)	Farmington	91	30
Willhite Forest Prod. (sawmill)	Farmington	868	0
Wharton Creek Wood Prod (sawmill)	Farmington	195	110
C Earl farrell (wood mill)	Farmington	69	10
Parker Wood Products	Farmington	149	50
Total		13,867	9,551

In addition, we used voltage reduction at the following Distribution substations:

Baldwin 3%
Carley Rd 3%
Combs 3%
Dyess 3%
Eddie Walker 3%
Farmington 3%
Fayetteville West 5%
Greenland 3%
Gulley Rd 3%
Harp Hill 3%
Johnson 2.5%
Paradise 3%
Springdale 3%
Strickler 3%
Tontitown 3% (three trans)
Wyola 3%
Zion 3%

We estimate that the voltage reduction shaved about 5,000 kW off our load at the peak hour.

We have no irrigation, air conditioner, water heater, or other direct control.

In addition, we have many poultry complexes with generation that might be set up to respond with plan I estimate this could shave an additional 6 to 8 MW off the peak demand.

Complete Energy Audit Program

1. Summary of program

OEEC's complete energy audit program is one of the first comprehensive energy audits offered by a utility. It utilizes blower door, Duct Blaster, theatrical fog machine and infrared testing equipment to determine heating and cooling loss in existing home structures. Using these testing technologies OECC's energy auditor can diagnose structural deficiencies in a home or building that lead to high energy consumption. These technologies utilizes a tactile and visual reference to aid in the explanation of opportunities to save on home utility bills. If we can identify areas that need improvement, and fixes can be easily explained to the member, the member can make a real difference in their usage. In turn, if the member reduces his/her demand for energy OECC will benefit from the demand reduction. This produces a win win situation for both the member and OECC. This test will cost the member \$100 up front. Reimbursement of the initial cost of \$100 will be made to the member upon presentation of paid receipts for energy improvements and will be limited to \$100. A cost for the program allows the member to have vested interest in the program and will ensure areas that need improvement are fixed. The reimbursement process will verify that energy saving upgrades have been completed.

2. Qualifying members

- Must be a current member of Ozarks Electric.
- Member must live in the home.
- Member or designated person must be present for test. Audits will only be conducted from 9:00 a.m. – 2:00 p.m. Monday – Friday.
- Payment of \$100 must be made to OECC before audit can be scheduled.
- Member may request a basic energy audit that does not include blower door testing and verification. This audit is free to the members.

Complete energy audit program process

1. Member requests energy audit.
2. CSR will determine if member would like a complete audit, basic audit or high bill complaint.
3. If the member decides they want a Complete Energy Audit then the member must be qualified for program.

4. Payment must be made over the phone via credit card at this time. If member would rather submit a check for this service they can do so, but they cannot be scheduled until payment is made.
5. Upon receipt of payment, e-mail is sent to James Reid jreid@ozarksecc.com with the members name, account number, and phone they can be reached at to schedule the test.
6. James Reid calls member to schedule appointment.
7. Test is completed leaving member with blower door test results and recommendations.
8. OECC receives forms and receipts - issues a bill credit for reimbursement up to \$100.

Inspection Report

Report Date 2/16/2010

Company OECC
Address P.O. Box 848 Fayetteville
 AR 72702
Thermographer Keith Kaderly
 kkaderly2@ozarksecc.
 com

Customer Time 6:50 p.m.
Site Address 379 Claybrook Dr.
 Farmington AR 72730
Contact Person Keith Kaderly

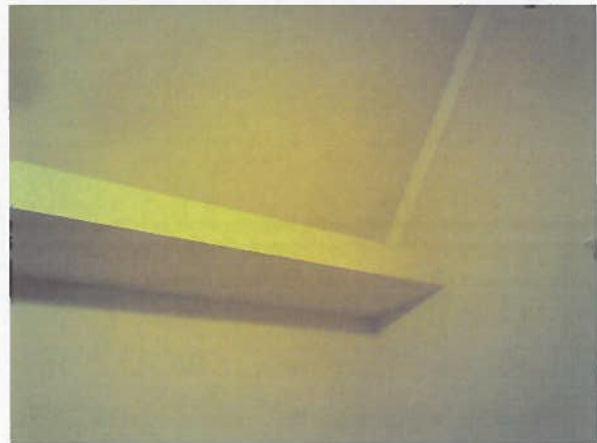
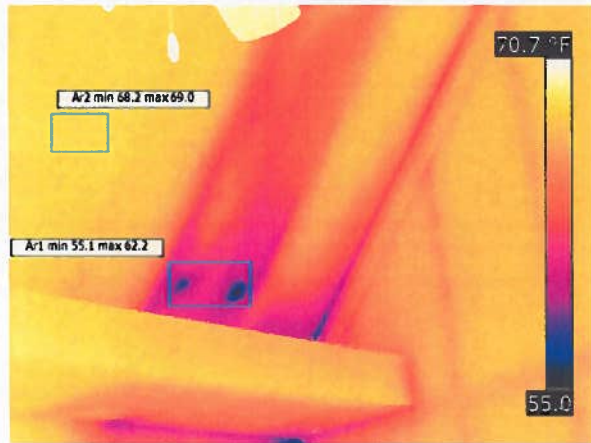


Image and Object Parameters

Text Comments

Camera Model	FLIR B200_ Western	Atmospheric Temp	70.9F
Image Date	2/16/2010 9:47:40 PM	Relative Humidity	50.0%
Image Name	IR_0309.jpg	Time for Report	2 hrs
Emissivity	0.95	ITC Course Date	2/8/10 - 2/11/10
Reflected apparent temperature	69.3 °F		
Object Distance	10.0 ft		

Description

Missing insulation in wall cavity estimated area to be 10.64 Sqr ft. If corrected from the current R 2.66 to the standard wall R 12.63 consumer could receive savings of approximately \$9.28 per year



Ozarks Electric Cooperative

A Touchstone Energy® Cooperative 

2011 Energy Audit and Deemed Savings Report

February, 2012

OVERVIEW

During 2011, Ozarks Electric Cooperative performed energy audits on the homes of at least **126 residential members, compared with 110 audits in 2010**. The energy audit procedure includes conducting an on-site inventory of home and energy use characteristics, analyzing options, and providing recommendations for energy efficiency improvements.

AUDIT RECOMMENDATIONS

Recommendations for energy use improvements are divided into eight general categories. In total for 2011, **there were 397 specific energy efficiency audit recommendations given to 86 member households**, broken down as follows (note that most homes have more than one type of recommendation) –

HVAC	75 homes (85%)	Insulation	52 homes (60%)
Weatherization	71 homes (83%)	Windows/doors	6 homes (7%)
Lighting	63 homes (73%)	Appliances	2 homes (2%)
Water heating	61 homes (66%)	Miscellaneous	0 homes (0%)

DEEMED SAVINGS

Deemed savings analysis is based on data produced by Frontier Associates LLC, showing estimated kW and kWh impacts for specific efficiency improvements. Based on the analysis in the Frontier report, **the following shows the estimated impacts of the 2011 efficiency improvement recommendations (and actual installations of 57 high-efficiency water heaters and 16,000 poultry LEDs) –**

	<u>2011</u>	<u>2010</u>
Total potential/actual kW peak demand reduction to co-op	120.1 kW	52.5 kW
Total potential/actual annual kWh reduction to members	905,589 kWh	361,732 kWh
Total potential/actual annual energy cost savings to members (\$0.08/kWh)	\$72,447	\$ 28,939
Total potential MMBTU reduction	3,090.14	1,234.34

The following shows the estimated and actual reduction in kWh usage and kW peak demand of the audit efficiency recommendations and water heater installations, as well as MMBTU reductions, by category –

Insulation	354,389 kWh	27.4 kW	1,209.28 MMBTU
Weatherization	75,628	7.0	258.07
HVAC	52,907	13.0	180.53
Water heating	14,236	1.1	48.58
Windows/doors	8,039	1.9	27.43
Appliances	2,755	0.4	9.40
Lighting	656,000	80	2238.36

This report was developed by Inside Information® Inc., Smithville, Missouri, as part of a member database project commissioned by Ozarks Electric Cooperative, Fayetteville, Arkansas.

Replace central air unit	0	\$	-	0.00	0	0.000	\$	-	988	0.4100
Replace or install new air-source heat pump	7	\$	-	50.33	14,749	3,150	\$	1,179.92	2,107	0.4500
Install geothermal heat pump	0	\$	-	0.00	0	0.000	\$	-	3,619	1.4140
Replace window A/C with high-efficiency window units	0	\$	-	0.00	0	0.000	\$	-	111	0.0950
Install or use ceiling fans	1	\$	-	0.00	0	0.000	\$	-		
Install programmable thermostat	0	\$	-	0.00	0	0.000	\$	-		
Adjust thermostat settings (lower winter, higher summer)	0	\$	-	0.00	0	0.000	\$	-		
Remove obstructions to inside HVAC units	0	\$	-	0.00	0	0.000	\$	-		
Remove obstructions to outside HP or CA unit airflow	0	\$	-	0.00	0	0.000	\$	-		
Repair/adjust backup heat strips/portable electric heaters	0	\$	-	0.00	0	0.000	\$	-		
Install drapes or window shades	0	\$	-	0.00	0	0.000	\$	-		
Total - HVAC (87% of homes)	85	\$	-	109.60	32,119	6,065	\$	2,569.52		
Water Heating										
Turn down/add timer for water heater thermostat	4	\$	-	0.00	0	0.000	\$	-	76	0.006
Install water heater insulation wrap/blanket	53	\$	-	13.74	4,028	0.318	\$	322.24		
Repair leaks in water heater tank or pipes	0	\$	-	0.00	0	0.000	\$	-		
Install more efficient water heater *	58	\$	-	34.83	10,208	0.812	\$	816.64	176	0.014
Service/repair/replace water heater element	1	\$	-	0.00	0	0.000	\$	-		
Install hot water pipe insulation	0	\$	-	0.00	0	0.000	\$	-	44	0.014
Install faucet aerators	0	\$	-	0.00	0	0.000	\$	-	140	0.012
Install low-flow showerheads	0	\$	-	0.00	0	0.000	\$	-	190	0.017
Use cold water for washing clothes	0	\$	-	0.00	0	0.000	\$	-		
Total - Water Heating (66% of homes)	59	\$	-	48.58	14,236	1,130	\$	1,138.88		
Miscellaneous										
Begin leveled billing	0	\$	-	0.00	0	0.000	\$	-		
Reduce use/add timers on pool/hot tub/garden pumps	0	\$	-	0.00	0	0.000	\$	-		
General conservation, unplug appliances when not in use	0	\$	-	0.00	0	0.000	\$	-		
Explain fuel cost adjustment	0	\$	-	0.00	0	0.000	\$	-		
Repair, replace, or cycle dehumidifier	0	\$	-	0.00	0	0.000	\$	-		
Test or check electric meter/breaker/check wiring	0	\$	-	0.00	0	0.000	\$	-		
Test or check water well pump	0	\$	-	0.00	0	0.000	\$	-		
Explain weather/usage, recommend full energy audit	0	\$	-	0.00	0	0.000	\$	-		
Total - Miscellaneous (0% of homes)	0	\$	-	0.00	0	0.000	\$	-		
GRAND TOTAL	16,397	\$	-	3,090.14	905,589	120.1	\$	72,447		

Ozarks Electric Cooperative Energy Audit Trends

* From 2011, 2010, 2009, 2008 energy audit reports compiled by Inside Information, Inc.

	n=122	n=60	n=110	n=86	
Annual Savings from Measures Recommended/Completed (@ \$0.08/kWh)	2008	2009	2010	2011	1yrTrend
Lighting	\$50	\$775	\$2,880	\$164	-\$2,716
Appliances	\$198	\$0	\$0	\$132	\$132
Insulation	\$10,222	\$13,179	\$13,463	\$10,210	-\$3,253
Weatherization	\$1,539	\$3,366	\$7,212	\$5,110	-\$2,102
Windows and doors	\$1,078	\$0	\$0	\$643	\$643
HVAC	\$2,655	\$3,784	\$3,726	\$2,570	-\$1,156
Water heating	\$188	\$1,436	\$1,658	\$1,139	-\$519
Miscellaneous	\$0	\$0	\$0	\$0	\$0
Total	\$15,930	\$22,540	\$28,939	\$19,968	-\$8,971
Measures Recommended/Completed	2008	2009	2010	2011	1yrTrend
Lighting					
Install compact fluorescent bulbs	19	45	159	62	-97
Install LED lights	0	200	750	16,000	15,250
Inspect recessed light fixtures	0	3	10	2	-8
Reduce operation of heat lamps	1	0	0	0	0
Appliances					
Replace refrigerator/freezer with EnergyStar model	3	0	0	2	2
Upgrade general appliances to EnergyStar models	0	1	1	0	-1
Seal around refrigerator door	1	0	0	0	0
Turn down waterbed heater thermostat	1	0	0	0	0
Clean refrigerator coils	0	1	0	0	0
Insulation					
Add attic insulation	36	45	62	48	-14
Add or repair wall insulation	6	6	1	6	5
Install insulation for floor, crawl space, trailer skirting	2	4	1	0	-1
Weatherization					
Caulk or weatherstrip around doors or windows	24	43	76	62	-14
Seal pipes, attic fan, vents, lights, baseboard, etc.	13	21	73	52	-21
Close or repair fireplace damper/seal flue	1	2	0	9	9
Repair holes in ceiling/exterior wall	2	0	0	1	1
Repair leaky bathroom vent/install new exhaust fan	0	0	0	1	1
Close off or seal crawl space	2	4	1	0	-1
Repair/install attic air-flow vents	2	0	0	0	0
Total	285	285	16,950	15	1
Measures Recommended/Completed	2008	2009	2010	2011	1yrTrend
Lighting					
Install compact fluorescent bulbs	19	45	159	62	-97
Install LED lights	0	200	750	16,000	15,250
Inspect recessed light fixtures	0	3	10	2	-8
Reduce operation of heat lamps	1	0	0	0	0
Appliances					
Replace refrigerator/freezer with EnergyStar model	3	0	0	2	2
Upgrade general appliances to EnergyStar models	0	1	1	0	-1
Seal around refrigerator door	1	0	0	0	0
Turn down waterbed heater thermostat	1	0	0	0	0
Clean refrigerator coils	0	1	0	0	0
Insulation					
Add attic insulation	36	45	62	48	-14
Add or repair wall insulation	6	6	1	6	5
Install insulation for floor, crawl space, trailer skirting	2	4	1	0	-1
Weatherization					
Caulk or weatherstrip around doors or windows	24	43	76	62	-14
Seal pipes, attic fan, vents, lights, baseboard, etc.	13	21	73	52	-21
Close or repair fireplace damper/seal flue	1	2	0	9	9
Repair holes in ceiling/exterior wall	2	0	0	1	1
Repair leaky bathroom vent/install new exhaust fan	0	0	0	1	1
Close off or seal crawl space	2	4	1	0	-1
Repair/install attic air-flow vents	2	0	0	0	0
Total	205	205	191	19	7

Ozarks Electric Cooperative Energy Audit Trends

* From 2011, 2010, 2009, 2008 energy audit reports compiled by Inside Information, Inc.

	n=122		n=60		n=110		n=86		1yrTrend	TOTAL
	2008	2009	2010	2011	2010	2011	2011			
Measures Recommended/Completed										
Windows and doors										
Install new storm windows/upgrade windows	5	0	0	4	0	0	4	4	4	9
Install new insulated doors	1	0	1	2	1	2	2	1	1	4
Adjust or repair broken windows or doors	26	4	4	2	4	2	2	-2	-2	36
HVAC										
Repair, seal, close gaps in ductwork/return air	29	31	29	50	29	50	50	21	21	139
Change furnace/AC/ductwork filter	19	23	19	22	19	22	22	3	3	83
Replace or install new air-source heat pump or central air unit	28	11	10	7	10	7	7	-3	-3	56
Repair or service central air or air-source heat pump	16	2	3	5	3	5	5	2	2	26
Remove obstructions to inside HVAC vents/add return air	1	0	15	0	15	0	0	-15	-15	16
Remove obstructions to outside HP/CA unit airflow	1	0	0	0	0	0	0	0	0	1
Don't use fireplace and central heating at same time	0	1	0	0	0	0	0	0	0	1
Adjust HVAC thermostat settings	4	0	0	0	0	0	0	0	0	4
Install or use ceiling fans	0	0	0	1	0	1	1	1	1	1
Water heating										
Install more efficient water heater	9	89	97	58	97	58	58	-39	-39	253
Install water heater insulation wrap/blanket	10	30	48	53	48	53	53	5	5	141
Turn down WH thermostat/add timer to thermostat	4	3	2	4	2	4	4	2	2	13
Service/repair/replace water heater element	0	1	0	1	0	1	1	1	1	2
Repair leaks in water heater tank or pipes	2	0	0	0	0	0	0	0	0	2
Miscellaneous										
Reduce use/add timers on pool/hot tub/garden water pumps	14	0	1	0	1	0	0	-1	-1	15
Repair/replace/turn off breaker to water well pump	3	1	0	0	0	0	0	0	0	4
Recommend general conservation and full home energy audit	5	0	0	0	0	0	0	0	0	5
Check electric meter and wiring	1	0	0	0	0	0	0	0	0	1

**North Arkansas Electric Cooperative,
Incorporated**

Docket No. 08-044-RP



PO Box 1000, 225 South Main Street, Salem, AR 72576, www.naeci.com

2011 Energy Efficiency and Conservation Efforts

Cooperative Philosophy on the Efficient Use of Energy.

North Arkansas Electric Cooperative has always tried to do what is in the best interest of the member, which includes promoting energy efficiency when possible. The co-op's initial focus for its energy efficiency efforts was on helping the individual member obtain direct savings in electrical usage by installing energy efficiency measures that would have an immediate impact on their monthly bill. Because North Arkansas Electric is a cooperative with the mission of benefitting its members, in contrast to detached stockholders, energy efficiency promotions that cut kilowatt-hour sales benefit the member directly by saving them money.

A secondary benefit of NAEC promoting energy efficiency is the avoidance or delay of new power plant construction. This also results in a savings to the member-consumer, but has a long-term benefit in the form of holding down rates that would pay for the capital investment required for a new power plant.

Delaying or avoiding capital investment in new power plants can also be achieved by shifting electrical consumption to off-peak periods. North Arkansas Electric has been very successful in this area with its Load Management program and Energy Resource Conservation Loan program. These programs allow for much more efficient allocation of generation assets, thus delaying rate increases that usually accompany power plant construction.

Marathon Water Heater Lease Program *(See Attachment A & B)*

The Marathon Sheet detailing the monthly savings at the bottom shows what an average member would save per month if they installed a high efficiency Marathon Water Heater. When computing the figures we used our kWh charge of \$0.079. The \$5.38 average monthly savings was used to total the amount saved by our members who utilize our Marathon Lease

Program. In 2011, we leased 78 water heaters. The total year end savings for our members equaled \$2,835.26.

The controlled peak from these installations equated to 70.2 kW. This figure was computed by taking the number of water heaters leased times their wattage, then multiplying that number by 20 percent, which is the estimating operating time.

**No labor or overhead was used in these figures.*

Energy Resource Conservation (ERC) Loan Program – Heat Pumps

North Arkansas Electric Cooperative is among some of the leading electric distribution cooperatives across that nation that provides low interest money for energy efficiency improvements to its members through a program called Energy Resource Conservation. This program is offered through the Rural Utilities Service. Over the past twenty-six years, NAEC has loaned out approximately \$11,176,541 million dollars to approximately 2,800 members who were/are in need of replacing an outdated/inefficient heating and cooling system.

During 2011 NAEC processed 86 loans for its members through the ERC program. For the purpose of this Energy Efficiency report, we computed the Total Annual Dollar Savings and Total Annual kWh Saved based on the cooperative's own calculations. Additionally, we calculated the Total kW Demand and Total Annual kWh savings based on the Frontier Deemed Savings for Zone 8 and Zone 9.

NAEC Evaluation Based on SEER Savings Chart *(See Attachment C & D)*

Energy advisors within the cooperative compiled a chart detailing the estimated dollar savings per ton based on the existing SEER and new SEER of the location's heating and cooling system. From this we calculated a dollar savings of \$30,492 to our members. Additionally a Total Annual kWh Savings was calculated at 386,115.

Frontier Deemed Savings Guide *(See Attachment E)*

The areas served by NAEC fall under Zone 8 and Zone 9 in the Frontier Report. According to the Frontier Deemed Savings Guide, NAEC's ERC Loan program saved our members 136,509 kWhs. Additionally, 32 kW was saved as well.

**Labor and overhead put toward this program was not included in the figures listed above.*

NAEC Energy Audits *(See Attachment F)*

North Arkansas Electric Cooperative employs three full time energy advisors. During the 2011 year, these three employees conducted 91 energy audits for NAEC members. These audits were provided at no charge. A log of hours and mileage spent on each audit was completed.

The 91 audits resulted in 2,064 miles at a rate of \$0.55 and 178.00 hours of labor conducting the actual audit at a rate of \$25 per hour. In all, energy audits contributed \$5,585.20 toward energy efficiency efforts in 2011.

Load Management Credits Issued (See Attachment I)

North Arkansas Electric Cooperative provides its members with the opportunity to receive load management credits on their bill for four months out of the year. By enrolling in the Load Management program, the member agrees to allow the cooperative to install load management switches on the member's electric water heater and an electric air conditioner pulling specified minimum amperage. In 2011 we issued \$363,126.76 in Load Management credits to members for allowing NAEC to decrease load during peak demand time. For more details on this rate, please see NAEC's rate schedule No. 6 & 7, sheets 20-23.

**Labor and overhead put toward this program was not included in the figures listed above.*

Television Advertisement

North Arkansas Electric budgets each year an amount for TV ads to relay a variety of messages related to the co-op. In 2011 approximately 100% of those ads were directed toward energy efficiency education for a total of \$1,428.00. These energy efficient ads ran throughout the year. Also during peak usage periods an "Energy Alert" ticker would scroll across KAIT TV 8 screens to inform members to curtail usage of non-essential appliances. This helped to reduce our summer peak demand.

Rural Arkansas Magazine

Each month we send out approximately 25,000 *Rural Arkansas* magazines to NAEC members. Likewise, approximately 20 percent of the available space for 2011 was dedicated to energy efficiency education. North Arkansas Electric's 20 percent portion for energy efficiency equated to \$13,642.15.

Fair & Expo Educational booths

Each year North Arkansas Electric Cooperative participates in one home show, two health fairs and three county fairs. We find that members ask employees several questions regarding the efficiency of their home and its appliances. The cooperative purchased brochures produced by NRECA highlighting ways to make your home efficient. When you combine the cost of these brochures and the amount spent on trade shows educating members, \$1,524.18 was dedicated to energy efficiency during these events.

Summary

Approximate costs spent by North Arkansas Electric for energy efficiency and load shifting efforts as listed in this report total well over \$400,000.

The above also does not include the costs of efforts sponsored by AECC, of which North Arkansas Electric is a participating member. Likewise, the portion of savings benefiting AECC that were not allocated back to NAEC in the form of lower wholesale power costs (i.e.: delay or avoidance of generating plant construction), also are not included in this report.

ANNUAL OPERATING COST

Marathon™ vs. Conventional Water Heaters

Electric Rate =	\$ 0.079	Kwh
Natural Gas Rate =	\$ 0.93	Therm
Propane Rate =	\$ 1.89	Gallon
Oil Rate=	\$ 1.55	Gallon

	Conventional Electric	Natural Gas	Propane	Oil	Marathon™
January	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
February	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
March	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
April	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
May	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
June	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
July	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
August	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
September	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
October	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
November	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74
December	\$ 36.12	\$ 20.02	\$ 44.54	\$ 23.25	\$ 30.74

Annual cost: \$433.44 **\$ 240.22** **\$ 534.51** **\$ 279.03** **\$ 368.89**

Comparison based on a Marathon™ water heater versus conventional steel water heaters

Existing electric water heater Energy Factor (50 gallon)	0.8
Marathon™ water heater Energy Factor (50 Gallon)	0.94
Natural Gas water heater Energy Factor (40 Gallon)	0.58
Propane water heater Energy Factor (40 Gallon)	0.58
Oil-fired water heater Energy Factor (32 Gallon)	0.60

\$ 5.38 Monthly Savings multiplied by remaining months in year equals the annual savings

ANNUAL OPERATING COST

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Electric Rate =	Kwh	\$ 0.079
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Annual cost:	\$ 433.44	\$ 240.22	\$ 534.51	\$ 279.03	\$ 368.89

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Propane water heater Energy Factor (40 Gallon)	0.58
Oil-fired water heater Energy Factor (32 Gallon)	0.60

\$ 5.38 Monthly Savings multiplied by remaining months in year equals the annual savings

Marathon Leases

	Number of Leases	Estimated Savings/Mo per Heater	Estimated Savings/Yr per Heater	kW Controlled During Peak	Frontier Deemed Savings
Jan	9	\$5.38	\$581.04	8.1	n/a
Feb	8	\$5.38	\$473.44	7.2	n/a
Mar	4	\$5.38	\$215.20	3.6	n/a
Apr	6	\$5.38	\$290.52	5.4	n/a
May	7	\$5.38	\$301.28	6.3	n/a
Jun	7	\$5.38	\$263.62	6.3	n/a
Jul	10	\$5.38	\$322.80	9	n/a
Aug	4	\$5.38	\$107.60	3.6	n/a
Sep	5	\$5.38	\$107.60	4.5	n/a
Oct	3	\$5.38	\$48.42	2.7	n/a
Nov	8	\$5.38	\$86.08	7.2	n/a
Dec	7	\$5.38	\$37.66	6.3	n/a
	78 Total Year End		\$2,835.26	70.2	

** Demand Savings based on 4500 watt elements operating 20% of the time

*** For Estimated Savings/Mo per Heater, see Marathon Sheet

SEER SAVINGS

Estimated Annual Dollar Savings Per Ton

Seer	New	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15	15.5	16	17	18	19	20	21
6	Old	\$141	\$156	\$169	\$182	\$193	\$203	\$212	\$220	\$228	\$235	\$242	\$248	\$254	\$260	\$265	\$274	\$282	\$290	\$296	\$303
6.5	Unit	\$109	\$123	\$137	\$149	\$160	\$170	\$179	\$188	\$195	\$203	\$209	\$216	\$222	\$227	\$232	\$241	\$250	\$257	\$264	\$270
7		\$81	\$96	\$109	\$121	\$132	\$142	\$151	\$220	\$168	\$175	\$182	\$188	\$194	\$199	\$204	\$214	\$222	\$229	\$236	\$242
7.5		\$56	\$71	\$85	\$97	\$108	\$118	\$127	\$136	\$143	\$151	\$182	\$188	\$194	\$175	\$180	\$189	\$198	\$205	\$212	\$218
8		\$35	\$50	\$64	\$76	\$87	\$97	\$106	\$114	\$122	\$129	\$136	\$142	\$148	\$154	\$159	\$168	\$176	\$184	\$191	\$197
8.5		\$17	\$31	\$45	\$57	\$68	\$78	\$87	\$96	\$103	\$111	\$117	\$124	\$130	\$135	\$140	\$149	\$158	\$165	\$172	\$178
9			\$15	\$28	\$40	\$51	\$61	\$71	\$79	\$87	\$94	\$101	\$107	\$113	\$118	\$124	\$133	\$141	\$149	\$155	\$161
9.5				\$13	\$25	\$36	\$47	\$56	\$64	\$72	\$79	\$86	\$92	\$98	\$104	\$109	\$118	\$126	\$134	\$140	\$146
10					\$12	\$23	\$33	\$42	\$51	\$59	\$66	\$73	\$79	\$85	\$90	\$95	\$105	\$113	\$120	\$127	\$133
10.5						\$11	\$21	\$30	\$39	\$47	\$54	\$61	\$67	\$73	\$78	\$83	\$93	\$101	\$108	\$115	\$121
11							\$10	\$19	\$28	\$36	\$43	\$50	\$56	\$62	\$67	\$72	\$82	\$90	\$97	\$104	\$110
11.5								\$9	\$18	\$25	\$33	\$39	\$46	\$52	\$57	\$62	\$71	\$80	\$87	\$94	\$100
12									\$8	\$16	\$24	\$30	\$37	\$42	\$48	\$53	\$62	\$71	\$78	\$85	\$91
12.5										\$8	\$15	\$22	\$28	\$34	\$39	\$44	\$54	\$62	\$70	\$76	\$82
13										\$0	\$7	\$14	\$20	\$26	\$32	\$37	\$46	\$54	\$62	\$68	\$74

* all figures are based on annual operating hours of 2750

** figures based on an average cost per kWh of 7.7, calculated by adding a 12 month average of the power cost and debt cost to our average residential rate of 6.8 cents

*** figures based on maintaining an indoor operating temperature of 75 degrees

Energy Resource Conservation Loans

Energy Efficiency Report
Based on NAEC SEER Chart Savings

Account Number	Original Loan Date	Existing SEER	New SEER/EER	Tonage	Estimated Annual Savings Per Ton	Total Annual Dollar Savings
11970102	12/30/11	8	15	2.5	\$148	\$370
10076002	01/04/11	10	15	3	\$85	\$255
11643103	01/05/11	8	15	2.5	\$148	\$370
9588203	01/11/11	10	15	2.5	\$85	\$213
5911102	01/18/11	10	15	3	\$85	\$255
12175802	01/18/11	8	14	3	\$136	\$408
11549304	01/25/11	10	15	3	\$85	\$255
7760104	01/25/11	10	15	3.5	\$85	\$298
12470302	01/27/11	8	15	3.5	\$148	\$518
Additional loan was closed in Jan for windc						\$2,941

13411202	02/02/11	10	15	3.5	\$85	\$298
10611104	02/04/11	12	17	3.5	\$62	\$217
13609502	02/23/11	10	15	5	\$85	\$425
8201802	02/22/11	6	15.5	3.5	\$260	\$910
1000900736	02/23/11	10	15	3.5	\$85	\$298
						\$2,147

11462602	03/09/11	10	15	3	\$85	\$255
11396103	02/24/11	12	16	3	\$53	\$159
12296902	03/08/11	8	14	3	\$136	\$408
1027602	03/07/11	8	15	3	\$148	\$444
9948702	03/11/11	12	15	3.5	\$42	\$147
9588202	01/11/11	10	15	2.5	\$85	\$213
7243005	03/21/11	8	15	3	\$148	\$444
6257130	03/17/11	10	15.75	2.5	\$90	\$225
11484902	03/15/11	10	14	3	\$73	\$219
13761102	03/25/11	6	15	3	\$254	\$762
11919102	03/29/11	12	15	3.5	\$42	\$147
9475402	03/08/11	12	15.75	3.5	\$48	\$168
						\$3,591

10600207	04/19/11	12	22	4	\$100	\$400
8036502	04/11/11	12	15	2.5	\$42	\$105
10132004	04/01/11	10	15	3	\$85	\$255
11479505	04/14/11	8	15	3.5	\$148	\$518
12840702	04/26/11	6	18	4	\$282	\$1,128
12182205	04/27/11	8	15	3.5	\$148	\$518
						\$2,924

9774203	05/05/11	12	15	2.5	\$42	\$105
7685102	05/06/11	10	16	4	\$95	\$380
10678002	05/10/11	10	14.5	3.5	\$79	\$277
12489302	05/11/11	10	15	5	\$85	\$425
13068503	05/17/11	12	15	3	\$42	\$126
10356002	05/17/11	10	15	3.5	\$85	\$298
						\$1,610

10804603	06/24/11	8	15	3	\$148	\$444
12035002	06/06/11	wood furn	15	3	\$148	\$444
6542602	06/10/11	8	15	3	\$148	\$444

11975702	06/29/11	elect furn	15	3		\$148	\$444
							\$1,776

12348203	07/13/11		8	13	2		\$122	\$244
1035802	07/21/11		10	15	2.5		\$85	\$213
1123102	07/15/11		8	15	4		\$148	\$592
12016002	07/07/11		10	14	2.5		\$73	\$183
171853104	07/13/11		8	15	3		\$148	\$444
7703702	07/08/11		10	15	3.5		\$85	\$298
10644302	07/11/11		10	21	5		\$133	\$665
11521402	07/25/11		8	14	2.5		\$136	\$340
								\$2,978

10133803	07/29/11		8	15	3.5		\$148	518.000
10887002	08/01/11		8	15	2.5		\$148	370.000
208702	08/03/11		10	15	2.5		\$85	212.500
7932702	08/03/11		8	15.25	2.5		\$148	370.000
11577302	08/05/11		8	14	3		\$136	408.000
11618203	08/10/11		10	15	2.5		\$85	212.500
10415007	08/10/11		8	15	2.5		\$148	370.000
13741602	08/18/11		8	15	3		\$148	444.000
12488302	08/18/11		16	15	2.5			0.000
5659602	08/08/11		10	15.75	2.5		\$90	225.000
8640402	08/18/11		10	17	4		\$105	420.000
12843802	08/26/11		10	15	3		\$85	255.000
								\$3,805

7723802	08/26/11		10	14	4		\$73	\$292
13468802	09/06/11		8	15	3.5		\$136	\$476
13032303	09/02/11		8	14	3		\$136	\$408
12550502	09/07/11		10	15	3		\$85	\$255
10969901	09/09/11		8	15	3		\$148	\$444
11605102	09/10/11		10	15	3.5		\$85	\$298
10158004	09/13/11		10	15	3.5		\$85	\$298
6153902	09/14/11		8	15	3.5		\$148	\$518
6018102	09/14/11		10	15	2.5		\$85	\$213
7150102	09/15/11		8	15	2.5		\$158	\$395
10735702	09/15/11		10	15	3		\$85	\$255
8338102	09/23/11		11	15.5	3		\$67	\$201
								\$4,052

10090802	10/04/11		8	14.25	2.5		\$136	\$340
319102	10/03/11		8	15	3		\$148	\$444
10656305	10/03/11		10	16	4		\$95	\$380
7772802	10/05/11		8	15	3		\$148	\$444
9307902	10/01/11		10	15	3		\$85	\$255
13833402	10/11/11		8	15	2.5		\$158	\$395
13432204	10/14/11		12	14	2		\$30	\$60
								\$2,318

13271802	11/22/11		4	14.25	2.5		\$248	\$620
								\$620

50249002	12/01/11		8	15.5	3.5		\$154	\$539
112124002	12/01/11		10	15	4		\$85	\$340
60741002	12/20/11		8	14	3		\$136	\$408
99435002	12/20/11		8	15	3		\$148	\$444
								\$1,731

\$30,492

9261302 11/1/2011

Roof Loan

Total Annual kWh Saved
4,685
3,229
4,685
2,691
3,229
5,167
3,229
3,767
6,559
37,242

3,767
2,748
5,382
11,523
3,767
27,188

3,229
2,013
5,167
5,622
1,861
2,691
5,622
2,849
2,773
9,649
1,861
2,127
45,467

5,065
1,330
3,229
6,559
14,284
6,559
37,027

1,330
4,812
3,501
5,382
1,596
3,767
20,387

5,622
5,622
5,622

5,622
22,490

3,090
2,691
7,497
2,311
5,622
3,767
8,421
4,305
37,704

6,559
4,685
2,691
4,685
5,167
2,691
4,685
5,622
0
2,849
5,318
3,229
48,183

3,698
6,028
5,167
3,229
5,622
3,767
3,767
6,559
2,691
5,002
3,229
2,545
51,304

4,305
5,622
4,812
5,622
3,229
5,002
760
29,353

7,851
7,851

6,825
4,305
5,167
5,622
21,920

Energy Resource Conservation Loans

Energy Efficiency Report Based on Frontier Deemed Savings

Account Number	Original Loan Date	Existing SEER	New SEER/EER	Tonage	Frontier Savings		
					kWh	Demand	Zone
11970102	12/30/11	8	15	2.5	2,181	0.330	9
10076002	01/04/11	10	15	3	2,617	0.390	9
11643103	01/05/11	8	15	2.5	2,181	0.330	9
9588203	01/11/11	10	15	2.5	1,676	0.320	8
5911102	01/18/11	10	15	3	2,617	0.390	9
12175802	01/18/11	8	14	3	1,870	0.250	9
11549304	01/25/11	10	15	3	2,617	0.390	9
7760104	01/25/11	10	15	3.5	2,348	0.450	8
12470302	01/27/11	8	15	3.5	2,348	0.450	8
					20,455	3.300	

13411202	02/02/11	10	15	3.5	3,053	0.460	9
10611104	02/04/11	12	17	3.5	3,133	0.470	8
13609502	02/23/11	10	15	5	4,361	0.660	9
8201802	02/22/11	6	15.5	3.5	3,053	0.460	9
1000900736	02/23/11	10	15	3.5	3,053	0.460	9
					16,653	2.510	

11462602	03/09/11	10	15	3	2,012	0.380	8
11396103	02/24/11	12	16	3	3,335	0.410	9
12296902	03/08/11	8	14	3	1,870	0.250	9
1027602	03/07/11	8	15	3	2,617	0.390	9
9948702	03/11/11	12	15	3.5	2,348	0.450	8
9588202	01/11/11	10	15	2.5	1,676	0.320	8
7243005	03/21/11	8	15	3	2,617	0.390	9
6257130	03/17/11	10	15.75	2.5	2,181	0.330	9
11484902	03/15/11	10	14	3	1,370	0.250	8
13761102	03/25/11	6	15	3	2,617	0.390	9
11919102	03/29/11	12	15	3.5	3,053	0.460	9
9475402	03/08/11	12	15.75	3.5	2,348	0.450	8
					28,044	4.470	

10600207	04/19/11	12	22	4	3,580	0.540	8
8036502	04/11/11	12	15	2.5	2,181	0.330	9
10132004	04/01/11	10	15	3	2,012	0.380	8
11479505	04/14/11	8	15	3.5	2,348	0.450	8
12840702	04/26/11	6	18	4	4,448	0.540	9
12182205	04/27/11	8	15	3.5	2,348	0.450	8
					16,917	2.690	

9774203	05/05/11	12	15	2.5	2,181	0.330	9
7685102	05/06/11	10	16	4	4,448	0.540	9
10678002	05/10/11	10	14.5	3.5	1,597	0.290	8
12489302	05/11/11	10	15	5	4,361	0.660	9
					12,587	1.820	

10804603	06/24/11	8	15	3	2012	0.380	8
12035002	06/06/11	wood furn	15	3	2,617	0.390	9
6542602	06/10/11	8	15	3	2,012	0.380	8
11975702	06/29/11	elect furn	15	3	2,012	0.380	8
8,653						1.530	

12348203	07/13/11	8	13	2	NA		9
1035802	07/21/11	10	15	2.5	1,676	0.320	8
1123102	07/15/11	8	15	4	2,683	0.510	8
12016002	07/07/11	10	14	2.5	1,141	0.210	8
171853104	07/13/11	8	15	3	2,012	0.380	8
7703702	07/08/11	10	15	3.5	3,053	0.460	9
10644302	07/11/11	10	21	5	4,476	0.670	8
11521402	07/25/11	8	14	2.5	1,558	0.210	9
16,599						2.760	

10133803	07/29/11	8	15	3.5	3,053	0.460	9
10887002	08/01/11	8	15	2.5	2,181	0.330	9
208702	08/03/11	10	15	2.5	1,676	0.320	8
7932702	08/03/11	8	15.25	2.5	2,181	0.330	9
11577302	08/05/11	8	14	3	1,870	0.250	9
11618203	08/10/11	10	15	2.5	1,676	0.320	8
10415007	08/10/11	8	15	2.5	1,676	0.320	8
13741602	08/18/11	8	15	3	2,617	0.390	9
5659602	08/08/11	10	15.75	2.5	2,181	0.330	9
8640402	08/18/11	10	17	4	4,448	0.540	9
12843802	08/26/11	10	15	3	2,012	0.380	8
25,571						3.970	

7723802	08/26/11	10	14	4	1,826	0.330	8
13468802	09/06/11	8	15	3.5	2,348	0.450	8
13032303	09/02/11	8	14	3	1,870	0.250	9
12550502	09/07/11	10	15	3	2,012	0.380	8
10969901	09/09/11	8	15	3	2,012	0.380	8
11605102	09/10/11	10	15	3.5	2,348	0.450	8
10158004	09/13/11	10	15	3.5	3,053	0.460	9
6153902	09/14/11	8	15	3.5	2,348	0.450	8
6018102	09/14/11	10	15	2.5	1,676	0.320	8
7150102	09/15/11	8	15	2.5	1,676	0.320	8
10735702	09/15/11	10	15	3	2,012	0.380	8
8338102	09/23/11	11	15.5	3	2,617	0.390	9
25,798						4.560	

10090802	10/04/11	8	14.25	2.5	1,558	0.210	9
319102	10/03/11	8	15	3	2,012	0.380	8
10656305	10/03/11	10	16	4	3,580	0.540	8
7772802	10/05/11	8	15	3	2,617	0.390	9
9307902	10/01/11	10	15	3	2,617	0.390	9
13833402	10/11/11	8	15	2.5	1,676	0.320	8
13432204	10/14/11	12	14	2	913	0.170	8

						14,973	2.400
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13271802	11/22/11	4	14.25	2.5	1,141	0.210	8
					1,141	0.21	

50249002	12/01/11	8	15.5	3.5	3,053	0.460	9
112124002	12/01/11	10	15	4	2,683	0.510	8
60741002	12/20/11	8	14	3	1,370	0.250	8
99435002	12/20/11	8	15	3	2,012	0.380	8
					9,118	1.60	
					196,509	32	

9261302 11/1/2011

Roof Loan

Energy Audit Report

2011 Year to Date

Account	Date of Audit	Mileage	Hours
5581771	1/1/2011	40	1.5
5911101	1/6/2011	36	2
11549301	1/7/2011	16	1.5
13687701	1/17/2011	12	1.5
13859701	1/25/2011	70	2.5
13715401	1/25/2011	6	1.5
11396101	1/27/2011	32	2
11959501	1/27/2011	24	2
13761101	1/31/2011	10	1.5
10171601	2/1/2011	14	1.5
8201801	2/2/2011	24	2
13609501	2/2/2011	22	2
12296901	2/7/2011	12	1.5
14201	2/8/2011	12	1.5
10987601	2/14/2011	24	2
11479501	2/17/2011	20	1
12167702	2/17/2011	24	2
8162401	2/23/2011	32	2
13483701	2/24/2011	28	2
13685802	2/28/2011	50	2
11919101	3/2/2011	18	2
11577301	3/11/2011	19	2
7243001	3/11/2011	24	1.5
9092801	3/7/2011	18	2
8036501	3/10/2011	16	1.5
11462602	3/15/2011	28	1.5
12035001	3/15/2011	26	1.5
12901601	3/21/2011	12	1.5
10195501	3/22/2011	33	2
10918801	3/25/2011	5	2
12182204	3/29/2011	12	1.5
11365801	3/30/2011	80	3
9282601	4/1/2011	20	2
10106601	4/7/2011	24	2
10356001	4/12/2011	28	2
12840701	4/12/2011	28	2
10678001	4/13/2011	20	1.5
13068501	4/21/2011	14	2
10600201	4/19/2011	4	1
9774201	4/25/2011	8.5	1.5
6717409	4/26/2011	16	2
7129401	4/28/2011	22	1.5
12728701	5/6/2011	22	2.5
12342102	5/9/2011	16	3
10249101	5/17/2011	22	2
8425501	5/17/2011	6	2.5
10368701	5/19/2011	12	3
13735501	5/24/2011	12	2.5
402801	6/7/2011	12	2
5276901	6/8/2011	24	2

10997201	6/9/2011	28	2
11847101	6/10/2011	10	1.5
11975701	6/13/2011	36	3
7703701	6/13/2011	24	2
12141401	6/14/2011	12	2
6556902	6/16/2011	16	2
9326201	6/21/2011	32	2.5
5665601	6/23/2011	46	3
12348201	6/29/2011	8	1.5
7853501	6/29/2011	26.5	2.5
11993101	6/29/2011	8	2
11272501	7/1/2011	26	2
13703401	7/7/2011	30	2
11521401	7/11/2011	24	2
13185401	7/12/2011	12	1.5
13032301	7/12/2011	10	1.5
13741601	7/14/2011	30	2
7932701	7/11/2011	23	1.5
8073701	7/20/2011	16	2
8640401	8/1/2011	8	1.5
11526401	8/2/2011	14	2.5
6200501	8/2/2011	2	2
8640401	8/1/2011	8	1.5
10065601	8/4/2011	30	2
11283701	8/4/2011	8	2
5599204	8/5/2011	18	3
5659601	8/8/2011	39	2
6153901	8/8/2011	11	1.5
10158001	8/11/2011	9	1.5
13375601	8/12/2011	24	2
3601401	8/12/2011	20	2.5
7772801	9/19/2011	26	2
8338101	9/15/2011		
9307901	9/7/2011	14	2
226003	9/8/2011	120	4
10090801	9/8/2011	6	1.5
77728001	9/16/2011	26	2
125863001	10/6/2011	40	2.5
103525001	11/18/2011	30	2.5
93058001	11/22/2011	24	2
89303001	12/12/2011	60	2.5
		2,064.00	178.00
		\$1,135.20	\$4,450.00

\$5,585.20

* mileage calculated using .55 cent/mile

** overhead calculated based on \$25/hour

Load Management Credits Issued to Members - 2011

Load Management Credit Issued to NAEC Members for 2011

\$363,126.76

KWH Utilized to Calculate the Above Credit

56,506,189.00

* Refer to North Arkansas Electric Cooperative's Rate Schedule No. 6 & 7, sheets 20-23 for a complete description of rate including availability, application, credit, contract period and other provisions.

Ouachita Electric Cooperative Corporation

Docket No. 08-062-RP



Ouachita Electric Cooperative Corporation
P. O. Box 877, 700 Bradley Ferry Road
Camden, Arkansas (870) 836-5791 – Toll Free 877-252-4538
www.oecc.com

Your Touchstone Energy[®]
Partner 

2011 Energy Efficiency and Conservation Report

Incorporated in 1938, Ouachita Electric has been dedicated to providing safe, reliable, and affordable electricity to its membership. In 2011, Ouachita Electric had 1,876 miles of line, and served an average of 9,457 meters. Large power members include several defense manufacturers, consumer products manufacturers, timber products companies and a two-year college.

Ouachita Electric participates in The Arkansas Energy Efficiency Education Program, Arkansas Weatherization Program, Deemed Savings Survey, and Energy Efficiency and Conservation APSC Reporting, at a statewide level.

Time of Use Rate

As an incentive to promote a more balanced use of total system generation resources, Ouachita Electric offers an optional time of use rate to large power customers. Under this rate, Non-coincident Peak kW is billed at 45% of the rate for Coincident Peak kW. The rate is available to customers requiring three-phase power in excess of 250 kW of demand.

Prepaid Metering

Ouachita Electric makes service available to residential customers on a prepaid basis. This program features an in home display unit that provides customers with daily and monthly usage data. Such a device gives customers the means to monitor and adjust power consumption continually. Research indicates that consumers on similar programs decrease kWh consumption an average of about 7%.

OECC ended 2011 with 121 prepaid accounts (up from the previous year's 79 accounts). Based on total usage for these customers: 92,003 kWh's, an approximate 6,440 kWh's were saved in the amount of \$708.40.

Membership Education

- Each member of Ouachita Electric receives a monthly issue of Rural Arkansas Magazine, which provides energy savings suggestions as well as energy efficiency tips and various other conservation topics. Each month Rural Arkansas

Magazine designates the center page to Ouachita Electric to use in providing important information to our members such as energy and conservation education. An estimated 35% of the magazine focused on energy efficiency and conservation. Total cost of magazine to Ouachita Electric: $\$35,903.38 \times 35\% = \$12,566.18$.

- Ouachita Electric sponsors the Doug Rye nationally syndicated radio program, "Home Remedies" on local radio station that can be heard throughout our service area. Doug Rye's radio program teaches listeners how to save money by making their homes more energy efficient. Cost of program for 2011: \$2,132.00. Additionally, \$7,068.88 was spent for newspaper ads and other radio ads. Approximately 20% of these ads were geared toward energy efficiency (\$1,413.78), for a total of \$3,545.78.
- At the request of a member, Ouachita Electric will perform an energy survey of the member's residence or business to identify opportunities for improving energy efficiency at that location. The member is then advised about specific steps that can be taken to achieve these efficiencies. During the reporting period, January – December 2011, experienced Cooperative personnel performed 8 energy audits/blower door tests at no cost to the consumer. Follow ups are performed to verify what recommendations are being employed at those locations. Three members had actually made the necessary improvements.

If each member implemented the recommendations given to them, we estimate a savings of about \$1,630.00.

- In 2011, Ouachita Electric spent \$17,769.27 for employee training in energy efficiency to better assist in educating its members. Trainings included the BPI Building Analyst Certification Class and the FLIR Residential Energy Audit Thermographer Certification Class.
 - Qualified member services representatives provide energy saving tips in response to member inquiries and high bill complaints. Member services representative consult with members to broaden his or her understanding of energy efficiency and conservation measures. MSR's logged time spent for counseling for a dollar amount of \$1,986.52
- OECC provides educational information both in either printed or electronic form. Approximately 25% of the website www.oecc.com has sections devoted to energy efficiency tools. Examples of these are the Apogee Home Energy Suite Pages, consisting of the Home Energy Calculator, the Interactive Energy Home, Geothermal Heat Pump Systems, Lighting Calculator, Heat Pump Calculator, Appliance Calculator and the Kids Korner. The site also provides a link to the U.S. Department of Energy website.

Inside-Information (maintaining website, customer surveys, etc.)
\$14,755.00 x 25% = \$3,688.75

- Through the Doug Rye Model Home Program, Ouachita Electric assists members in constructing new homes following energy efficiency building guidelines.
- Programs are made available to civic organizations relating to energy efficiency. Scott Davis, Magician, performs at local elementary schools and civic organizations. Much of his program is devoted to educating the public about energy efficiency, and advising them on ways to conserve energy. Doug Rye seminars are also held annually.
- Members are educated on the efficiency of Marathon Water Heaters.
- Ouachita Electric has conducted “Town Hall” meetings in each board district to emphasize the need for members to take stringent energy efficiency measures in the face of rising fuel costs and increased load demands.
- For the first time, OECC sponsored the 2011 “Mini Energy Efficiency Makeover” contest. The recipient was awarded \$7,477.52 in home improvements, which included cellulose insulation, a Marathon water heater, a 3 ton mini-split heating and air conditioning unit, windows, LED and CFL light bulbs, caulking and weather stripping. Compared to the same period in the prior year, the member saw a 42% reduction in his electric usage – equaling a monetary savings of \$414.92.

Summary of monies spent by Ouachita Electric Cooperative to educate our membership and promote energy efficiency:

Rural Arkansas	\$12,566.18
Radio and Newspaper Ads	1,413.78
Doug Rye Home Remedies	2,132.00
Customer Contact (including Energy Audits/Home Visits/Consultations)	1,986.52
Blower Door, Pressure Pan	2,463.87
Employee Training	17,769.27
OECC website	3,688.75
Mini Makeover Contest	<u>7,477.52</u>
Total	\$49,497.89

Summary of estimated savings to members:

Estimated Savings from Prepaid Metering	708.40
Estimated Savings from Audit Recommendations	1,630.00
Mini-Makeover Savings to Member	<u>414.92</u>
Total	\$ 2,753.32

Energy Efficiency and Conservation APSC Reporting

Ouachita Electric will report at regular specified intervals to the APSC on programs designed to provide its members with information about energy efficiency and conservation, and its practices to promote energy efficiency and conservation throughout its service territory.

Petit Jean Electric Cooperative Corporation

Docket No. 08-043-RP

Petit Jean Electric Cooperative Corporation

2011 Energy Efficiency Report

Petit Jean Electric continues to provide its members with programs and information that will help them understand and reduce their energy consumption. Residential and commercial energy audits help members identify energy wasting problems with building envelopes and electrical equipment in and around their home or business. Petit Jean has purchased blower door and infrared imaging equipment and power monitors for this purpose. We provide energy efficiency tips through radio ads, Doug Rye seminars, and website referrals, presentations to groups in Human Services programs and through direct contact. Members also receive the *Rural Arkansas Living* magazine that has tips on energy efficiency as well as information on public issues that affect them. We are now in the final stage of replacing an old metering system with a new TWACS metering system that gives us daily information on energy usage of our members. This system provides members with an hourly picture of their energy usage if they need it. MSRs and technicians attend meetings and receive training through programs provided or sponsored by Arkansas Electric that benefit cooperative members.

We have so far provided these services at no cost to our members and plan to continue these programs in the future.

Petit Jean Electric Cooperative Corporation

Energy Efficiency Expenditures 2011

Training and Seminars

Member Service Meetings	\$200
BPI class	\$500
Travel Expense	\$1,720
Hours	<u>\$4,400</u>
	\$6,820

Presentations and Events

County Fair (material and hours)	\$2,050
Doug Rye	\$395
Human Services (energy incentive program)	<u>\$740</u>
	\$3,185

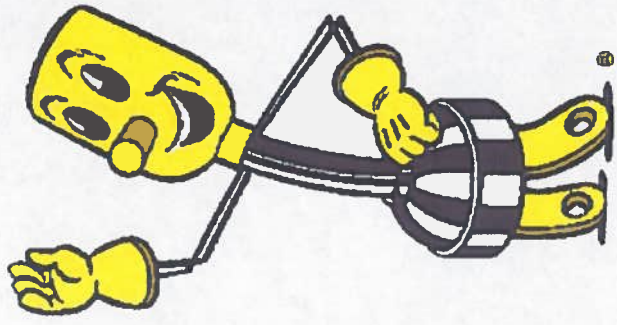
Media

<i>Rural Arkansas Living</i> member magazine	\$40,000
Radio ads (energy efficiency tips)	\$7,630
Website expense	<u>\$9,000</u>
	\$56,630

The new metering system is proving to be a valuable tool that helps us explain to the member the value of energy efficient equipment especially during extreme weather conditions. Audits help identify areas where improvements can be made to help reduce energy costs. Members are now becoming more aware of the importance and benefits of energy efficient materials and building techniques now available. With these programs members have the opportunity to become more informed and can make better decisions that affect their energy usage.



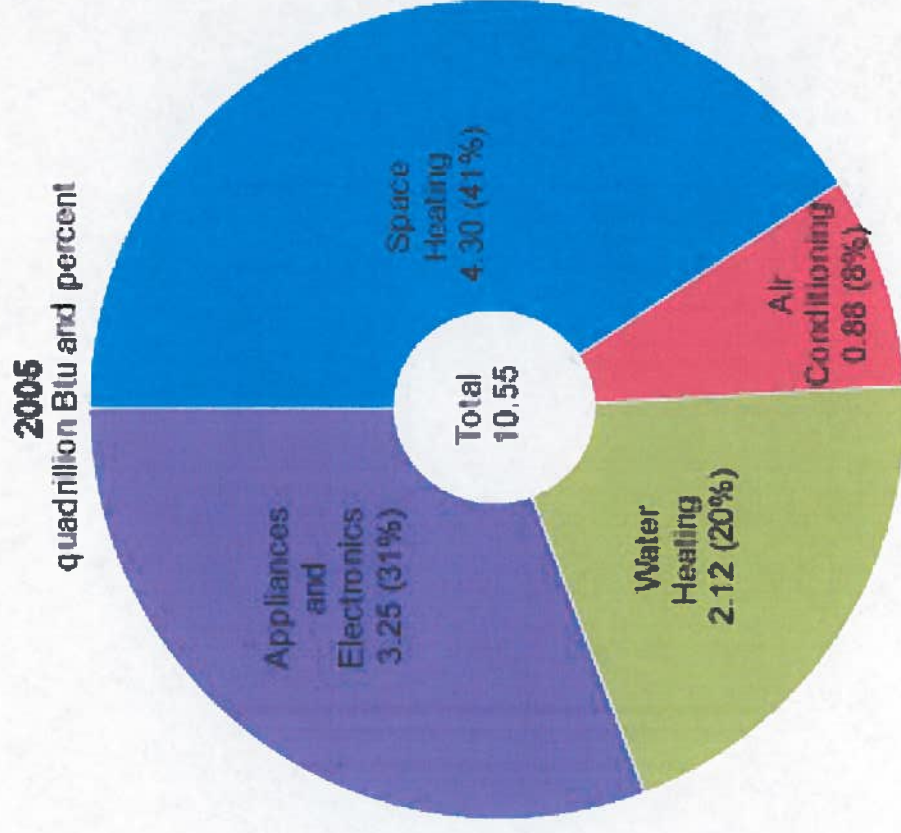
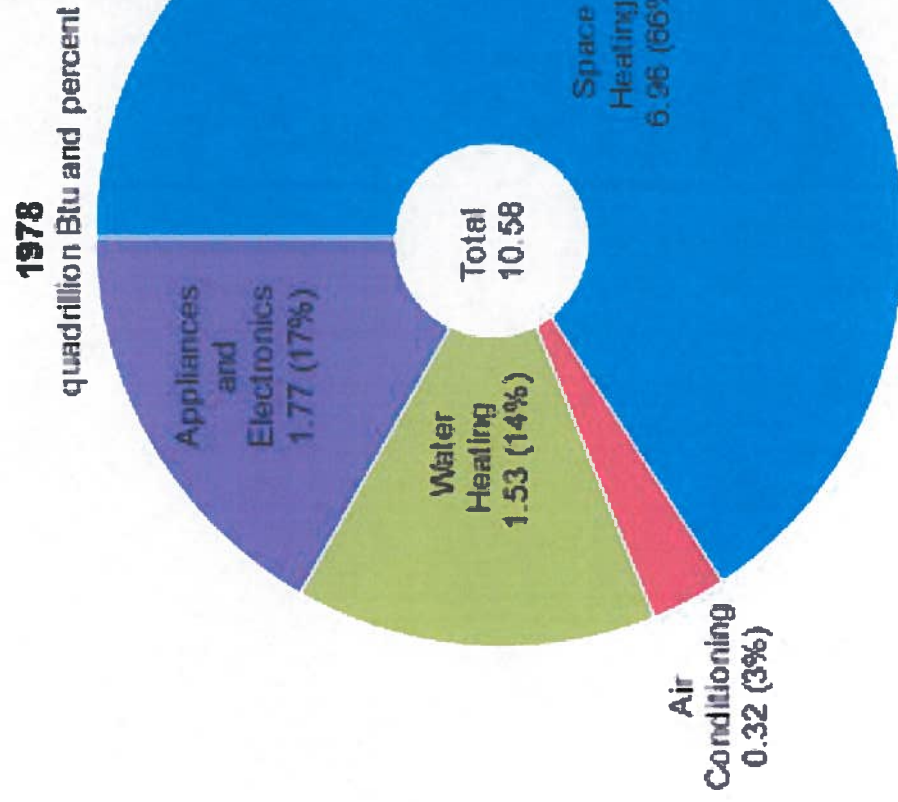
Energy Conservation And Energy Efficiency



Petit Jean Electric Cooperative Corporation

What uses electricity in and around your home?

Total energy use in homes



Source: U.S. Energy Information Administration, 1978 and 2005 Residential Energy Consumption Survey

In 1978 total energy use in the US equaled 10.58 quadrillion btus.
By 2005 total energy use in the US equaled 10.55quadrillion btus.

Why the decrease?

Around 1980 the idea of energy conservation came around; shortly after we started hearing the term energy efficiency.

What's the difference between energy conservation and energy efficiency?

1. Installing compact fluorescent light bulbs.

Energy efficiency

2. Turning off a light or TV when not in use.

Energy conservation

3. Getting ride of the old "extra" refrigerator in the carport.

Energy conservation

4. Replacing your old working refrigerator with an ENERGY STAR model.

Energy Efficiency

5. Installing low flow shower heads.

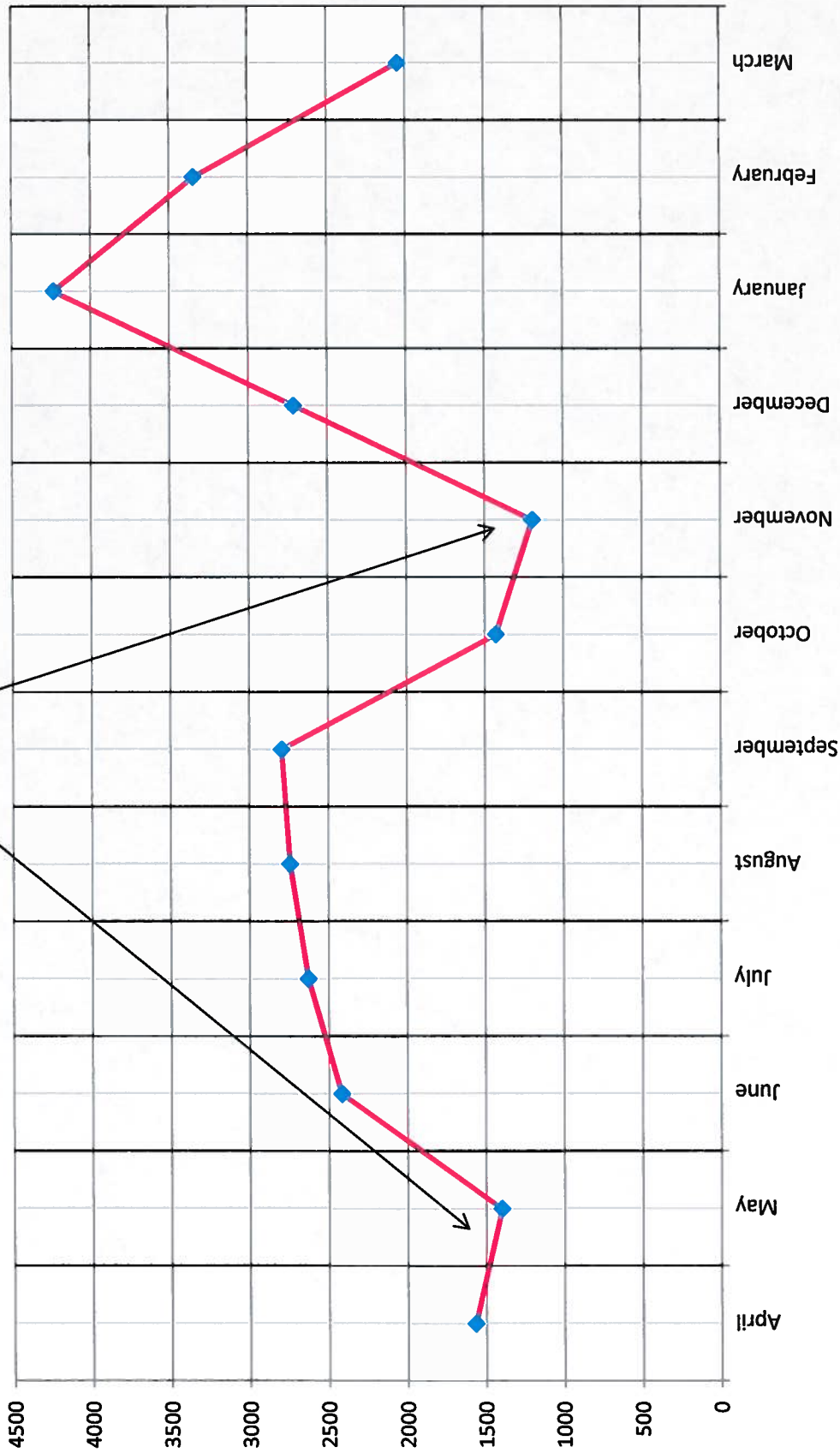
Energy conservation

6. Installing the recommended amount of insulation to your home.

Energy efficiency

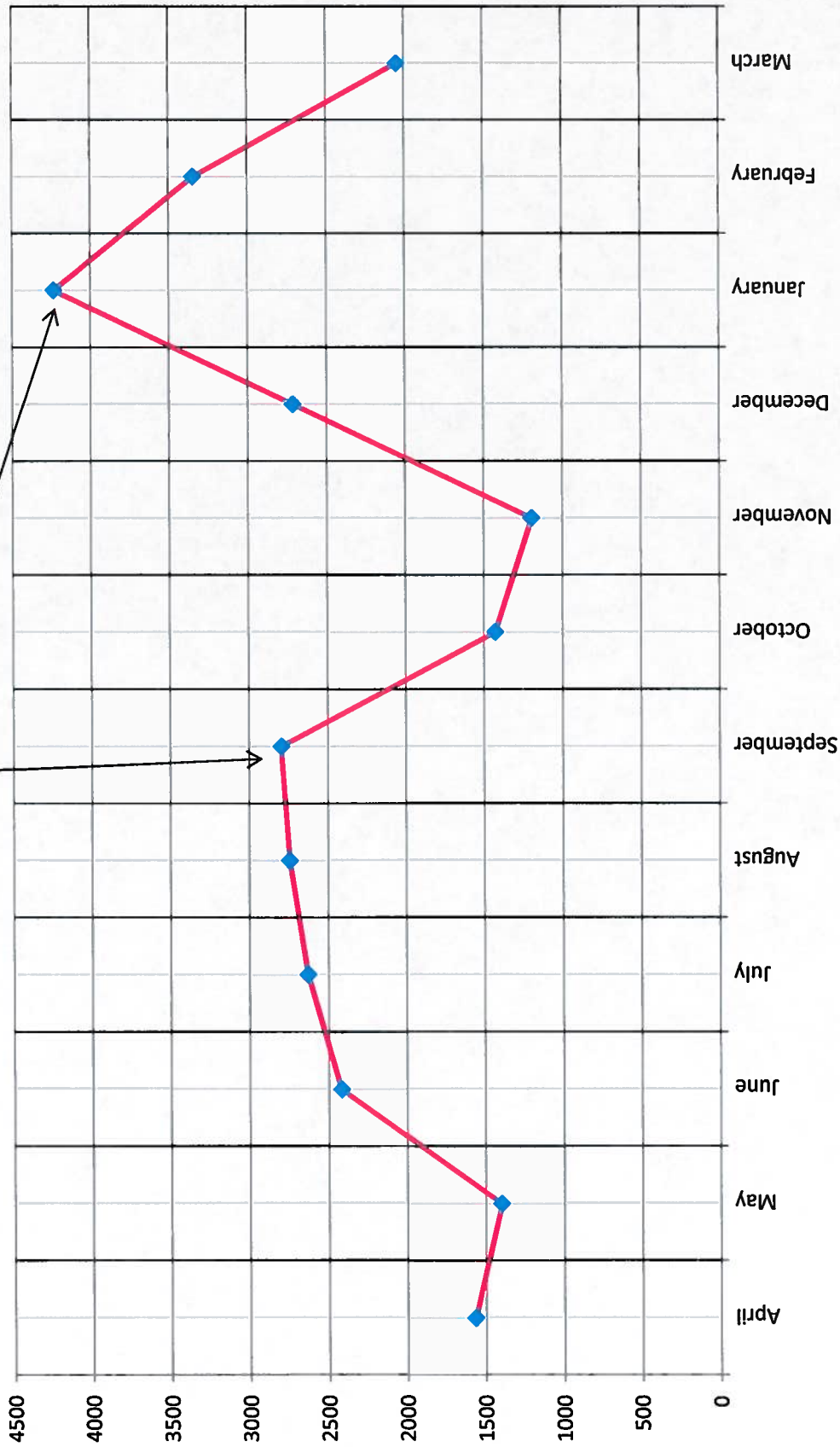
You can use both of these measures to help reduce your energy usage.

What measures will help reduce “base load”? Energy efficient appliances.



Where would you focus energy efficiency measures to reduce heating and cooling energy usage?

More efficient heating and cooling systems and improvements to home envelop.



Energy conservation is more or less free in that you decide if you are going to use an appliance or not.

Conservation measures can save money but may require a bit of inconvenience.

Energy efficiency measures vary in cost depending on what you do.

They will save money from the time you start them and continue saving year after year.



Low cost / No Cost Energy Savings Measures.

1. Convert to CFL light bulbs.
2. Install low flow shower heads and faucet aerators.
3. Fix dripping/leaking faucets.
4. Caulk and seal areas where there is air infiltration.
5. Insulate electric wall plugs and switches with foam pads.
6. Keep air filters inspected and replace regularly.
7. Insulate water heater (electric) and hot water lines.
8. Install heat traps on water lines at water heater.
9. Install blinds on windows facing sun.
10. Install sun blocking screens on windows facing sun.
11. Seal attic access door if located inside envelop of home.
12. Do not close supply registers on central heat and air conditioning systems.
13. Make sure window unit air conditioners are weather stripped properly.
14. Minimize the use of electric space heaters they cost .10 to .15 cents per hour.

Moderate to Expensive Projects Result in Long Term Savings.

1. Replacing older appliances with new ENERGY STAR rated appliances.
2. Improving or adding insulation to home envelope.
3. Adding a radiant barrier to your attic.
4. Upgrading existing heat and air unit with proper sized unit.
5. Adding a vapor barrier to crawl space and insulating walls of crawl space.
6. Replacing old single pane aluminum windows with low E insulated windows.
7. Upgrading or replacing old leaky duct work.

Some of these projects may seem very expensive at first but they will in fact pay for themselves in a few short years. That's not to mention the added comfort that comes along with it.



How to Lower Your Energy Bill

- Start by doing your own energy audit at home.
- Look for obvious energy wasters like, unsealed doors and windows, disconnected duct work, areas that are uncomfortable because of infiltration or direct sunlight.
- Caulk, weather strip, fill with expanding foam, fix bad duct work and leaky faucets. These require a small amount of money and some time but can bring immediate results.
- After you've completed these projects start looking at more involved projects: insulation levels, the age of your heat and air system, age and condition of windows and doors, age and efficiency of appliances. These are going to be more expensive things in improving the efficiency of your home but they can show a bigger saving in your energy bill.
- Become more educated on energy efficiency practices: learn how to tell what's running and how much it's costing you to run it. Owners manuals usually tell how much power an appliance normally uses. Learn how to read your meter and keep up with kilowatt hour usage especially around the time your utility reads it. You'll be more aware of what's using the energy you're paying for.

Energy Related Web Sites.

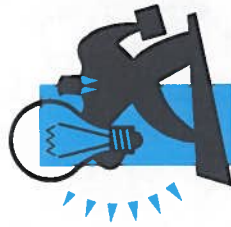
www.eia.doe.gov

www.energy.gov

www.homeenergy.org

www.energystar.gov

www.pjecc.com



Ice storm of 2009 north part of Van Buren County





Location 2000 near Van Dusen County line

**South Central Arkansas Electric Cooperative,
Incorporated**

Docket No. 08-055-RP

Arkansas Public Service Commission
Little Rock, Arkansas

South Central Arkansas Electric Cooperative (SCAEC) was incorporated on August 1, 1940. Our first lines were energized on April 22, 1942. We now have 1,851 miles of lines and we serve 10,040 members. We serve residential members, large manufacturing plants, saw mills, and one paper mill. To our large industrial members, we offer Peak load share. They can look at where Peak is about to hit and cut their load to save money.

SCAEC offers prepaid metering to our residential members. This program helps our members to conserve energy and helps them to become energy efficient. We have 27 prepaid accounts.

Members of SCAEC receive the Arkansas Living Magazine which offers energy efficient ideas, tips and suggestions.

We sponsor a radio program daily which offers tips about weather related issues, energy savings ideas, and how to contact us in case of an emergency.

SCAEC has updated its website to include numerous suggestions about energy efficiency and conservation, from landscaping your yard, to high efficiency heat pumps, insulation, windows, water heaters and placement of duct work. We also recommend changing incandescent bulbs to energy efficient florescent bulbs. We also discuss the value of caulking and window dressing such as window blinds, curtains and tinting. We participate in the Energy Efficiency Makeover.

SCAEC offers energy efficiency programs to the public. We use Scott Davis, magician, in the schools and at civic club meetings and community meetings. We also sponsor Doug Rye, The King of Caulk & Talk on the local radio program.

SCAEC educates its members through the use of the electrical safety trailer demonstration. During the demonstration, energy ideas and conservation are discussed.

SCAEC offers energy audits, blower door tests and high bill investigations.

Summary of monies spent by SCAEC:

Arkansas Living magazine yearly	\$33,150.26
Radio ads and Doug Rye sponsorship	3,600.00
Thermal imaging camera	3,500.00
SCAEC website	9,000.00
Employee training	3,000.00

Summary of estimated savings to our members:

Estimated savings through prepaid metering	\$4,400
Estimated savings through energy audit recommendations	1,000
Estimated savings through load shedding program	11,615.00

SCAEC is always willing and ready to help our members save money through educational programs, tips and conservation ideas.

Thank you, Joe Magnini
Members Services
South Central Arkansas Electric Cooperative, Inc.

**Ashley-Chicot Electric Cooperative,
Incorporated**

Docket No. 08-063-RP

**Ashley - Chicot Electric Cooperative Inc.
Hamburg, Arkansas**

2011 Energy Efficiency and Conservation Report

Ashley - Chicot Electric Cooperative was incorporated in February 1941 and energized the first lines in 1944. Since then, Ashley – Chicot Electric has been dedicated to providing safe, reliable, and affordable electricity to its membership. In 2011, Ashley - Chicot Electric served an average of 5,105 consumers, a large percentage from low-income families and a depressed agricultural area.

Ashley – Chicot Electric has engaged in the following activities: The Arkansas Energy Efficiency Education Program, Arkansas Weatherization Program, Deemed Savings Survey, and Energy Efficiency and Conservation APSC Reporting, at a state wide level, while engaging in load control and membership education within our service area.

Load Control

Ashley - Chicot Electric offers two rate options to irrigation customers, a controlled rate and an uncontrolled rate. The differences between these two rate options are significant in both cost and availability of power to the irrigation customer. The standard uncontrolled rate includes a cost per kilowatt-hour for each kWh used plus \$9.15 per horsepower per month. Irrigation customers can avoid the \$9.15 per horsepower charge by permitting the cooperative to install a radio-controlled switch on the pump. The control will interrupt power to the irrigation pump during periods when Ashley – Chicot Electric’s total load is contributing to a new statewide peak. The “controlled” periods can vary from two to six hours. The “control” periods can vary from a few days each summer to several consecutive days. Every effort is made to minimize the control periods and still not contribute to a higher peak demand. Historically, Ashley - Chicot Electric has achieved a 10% - 15% reduction in summer peck demand, which saves our members approximately \$150,000 - \$200,000 per year and postpones the need for 2-3 MW of new coal fired generation.

Membership Education

- Each member of Ashley - Chicot Electric receives a monthly issue of Arkansas Living Magazine, which provides energy savings suggestions as well as energy efficiency tips and various other conservation topics. Each month Rural Arkansas Magazine designates the center page to Ashley - Chicot Electric to use for providing important information to our members such as energy and conservation education as well as safety. The magazine is also being used in the Hamburg School System.

- Ashley - Chicot Electric sponsored the Doug Rye nationally syndicated radio program, "Home Remedies" on local radio stations that can be heard throughout our service area. Doug Rye's radio program teaches listeners how to save money by making their homes more energy efficient.

- Upon request of member, Ashley - Chicot Electric will assist with an energy survey of a residence and provide information on energy efficiency that will help with lowering their energy usage.

- Provides educational information at front desk free of charge to the members or to anyone who is interested. Member services representative will consult with members, upon request, to further help with understanding of energy efficiency and conservation measures. A representative follows up by phone to check on results of consultation and see if further assistance is needed. Through energy efficiency education we will help our members make wise energy choices.

- Assist members building a new construction with energy efficiency building guidelines. A copy of Building Guidelines for Energy Efficiency is available at our office free of charge.

- And educate members on the Marathon Hot Water Heater and the GE Hybrid Water Heater. We also assist with information on purchasing and help with delivery of water heater to our warehouse for pickup by member.

Energy Efficiency and Conservation APSC Reporting

Ashley - Chicot Electric will be reporting to the APSC the practices in providing its members with energy and conservation information.

What's to come in 2012

Ashley - Chicot Electric will soon launch a new website with emphasis on energy efficiency and innovative products on the market that will help the public become more efficient and wiser electricity users. Our website is in the final stages of preparation and should go live soon.

Conclusion

Ashley-Chicot Electric Cooperative continues to be committed to providing our members with safe, reliable, efficient and affordable electric power. We are a leader in demand response, energy efficiency, and the promotion of safety as well as being committed to keeping rates as low as possible without compromising quality and service.

**Rich Mountain Electric Cooperative,
Incorporated**

Docket No. 08-047-RP

**Rich Mountain Electric Cooperative Inc.
Mena, Arkansas
2011 Energy Efficiency and Conservation Report**

Rich Mountain Electric Cooperative Incorporated was incorporated May 2, 1945 and energized the first lines on June 10, 1946. Rich Mountain Electric Cooperative, Inc. provides high quality electrical service to its owner consumers (members). System reliability records at RMEC demonstrate a commitment to deliver excellent service and to fulfill this service obligation to the members. Safety is the top priority. RMEC participates in the statewide safety program, assigns safety responsibilities to qualified personnel, and provides programs on skill and knowledge improvement for employees through continuing education. The service area of Rich Mountain Electric Cooperative extends from the scenic Ouachita Mountain range on the North in Polk County, into the typically hilly and tree-covered terrain in Howard County to the South. The service area extends a short distance into Montgomery County on the east, Sevier County on the southwest, and McCurtain and LeFlore Counties in Oklahoma on the west.

Rich Mountain Electric Cooperatives system is made up of Residential and Small Commercial loads. Ninety percent (90%) of the total KWH sold and ninety one percent (89%) of the total revenue from the sales of electricity comes from the Residential sector. Ten percent (10%) of the total KWH sold and nine percent (11%) of the total revenue from the sales of electricity comes from the Small Commercial sector. Rich Mountain Electric Cooperative has eight thousand and sixty-eight (8,166) Residential and four hundred and thirteen (409) Small Commercial meters in service and maintains an average annual growth of two percent (2%). At this time there are no Large Commercial or Industrial loads on RMECs' system.

Tourism has a strong positive impact on the economy of the County areas, which embrace scenic mountains, numerous streams and small rivers. This environment supports the location of two popular state parks, thousands of acres of U.S. Forest land, and private forests open to the public. Residential development in the area owes a substantial measure of its success to the "fallout" from tourism. Many who tour the area are retirees who are influenced to locate here after becoming impressed with the beauty, climate and relaxed lifestyle that area residents enjoy. It is estimated that retirees occupy more than thirty-six percent (36%) of the new residences constructed in the Polk County area.

Rich Mountain Electric Cooperative has supported, assisted with, and actively participated in many programs that have and will continue to improve the quality of life for its members and other citizens in its service area. With a system made up of primarily residential load and a large percentage of members on fixed incomes, energy efficiency and conservation is not a new form of practice for RMEC or any other Electric Cooperative in the State of Arkansas. So with this in mind, we are proud to present our report to the Commission.

We would like to begin this report by stating the fact that after the 1979 energy crisis the Cooperatives in Arkansas began working forward to do everything possible to protect its Members from such a crisis. Cooperative leaders felt that a worse crisis would be inevitable unless they started changing the vastly increasing loads and dependencies on foreign oil. Drastic measures were made to ease as much of the future energy cost burden to the membership as possible. Some of these drastic measures included cash incentives that were given to consumers who installed high efficiency heat pumps and high efficiency water heaters (1987-1992) and

even more so, the operation of the Clyde T. Ellis Hydroelectric Generation Station in 1988 which was just the first of three.

Rich Mountain Electric Cooperative had been involved in educational programs for its Members and community since it was incorporated in 1945. With the advancements in technology, continuing education has been a crucial role in the relationship we maintain with our Members. Rich Mountain Electric Cooperatives' Energy Efficiency and Conservation Efforts are split in 15 primary components;

1) Website

Rich Mountain Electric Cooperatives website promotes safety, energy efficiency, Cooperative principles and the use of green power generation. On average we will have four members either come in to the office or call to enquire about green power generation. The cost to RMEC for this service was approximately \$10,000 for 2011

2) Newspaper ads

Rich Mountain Electric Cooperative puts monthly ads in the Mena Star and the Pulse. These ads contain information on safety and energy efficiency. The cost to RMEC for this service was approximately \$15,000 for 2011

3) Radio ads

Rich Mountain Electric Cooperative puts monthly ads on the Mena and Nashville radio stations. These ads contain information on safety and energy efficiency in addition to the Doug Rye show. The cost to RMEC for this service was approximately \$10,000 for 2011

4) Rural Arkansas magazine

Rich Mountain Electric Cooperative sends out to each of its members a copy of the Rural Arkansas magazine. The Rural Arkansas is printed through our state wide affiliate, Arkansas Electric Cooperative. The Rural Arkansas for Rich Mountain Electrics members is designed and printed to fit the specific needs of our service territory. The Rural Arkansas magazine contains tips and information on safety, energy efficiency in addition to the Doug Rye page, current affairs and a host of other information. The cost to RMEC for this service was approximately \$27,000 for 2011

5) Educational brochures

Rich Mountain Electric Cooperative has hand out brochures available on energy efficiency at each of its two offices. These brochures include Home Tightening, Water Heaters, Home Heating, 30 Simple things you can do to Save Energy and Money, Home Energy Projects, energy savers and Major Home Appliances. These were furnished to Rich Mountain Electric by Arkansas Electric Cooperative Corporation at no cost to Rich Mountain Electric.

6) Marathon water heater sales

Rich Mountain Electric Cooperative sells the Marathon water heaters because we believe they are the most energy efficient water heater on the market today. For a typical single family home, the water heater accounts for thirteen percent (13%) of the members' Annual energy bill. Low cost to no cost to Rich Mountain Electric.

7) Civic programs

Rich Mountain Electric Cooperative has supported, assisted with, and actively participates in many programs that have and will continue to improve the quality of life for its members and other citizens in its service area. RMEC personnel continue to work with the area chambers of commerce by serving on boards of directors and on various special industrial development and tourism committees of those organizations. RMEC recognizes the importance of an area's infrastructure to the process of enticing new business and industry, as well as other improvements to the quality of life for its citizens. On these programs we educate the public on areas of safety, energy efficiency and green power. The time for these projects is volunteered by Cooperative staff at low cost to no cost to Rich Mountain Electric.

8) Home visits to do energy audits and recommendations made over the phone

RMEC offers home heating and cooling energy surveys by trained staff members. Detailed heat loss calculations, equipment and insulation advice, and recommendations are offered to homeowners or prospective home-owners and general contractors. Analysis of consumer usage is also available. The cost to RMEC for this service was approximately \$49,000 for 2011.

9) Rural water systems

The cooperative has supported these efforts by offering organizational and operational assistance. With the well water in most our service territory containing large parts of iron and being extremely hard water, hot water heater elements going bad has been a constant. Generally, the bottom element will go bad due to iron build up thus causing the lower elements to have to work harder to control the water temperature. Another problem comes from the hard water eating holes in the foot valves in the well pumps which cause the pump to run constantly. These problems won't generally be noted until the members receive an increased light bill. So by the rural water systems coming in and installing better water for the rural areas on our system, they have helped our members to receive safer, cleaner water and a bonus of helping them conserve energy and maintenance cost from water heaters and well pumps. The cost to RMEC for this service was approximately \$4,500.00 in 2011.

10) Donating energy efficient electric ranges to the public schools

Rich Mountain Electric Cooperative has six public schools in its service territory. Every year one of the six schools receives a new energy efficient electric range from RMEC. RMEC delivers the range to the school talks to the schools home economic teachers about stressing to their students the fact that when they are future homemakers they should look at energy efficient appliances before purchasing. The ranges are furnished by Arkansas Electric Cooperative Corporation so the labor to deliver the range and talking to the teachers will be the only charges. The cost to RMEC for this service was approximately \$450.00 for 2011.

11) Speech contests sponsored by the Electric Cooperatives of Arkansas

A speech contest, sponsored by the electric cooperatives of Arkansas is held each year for high school juniors. Three winners from RMEC's service area are sent to tour Washington DC with similar winners from the service areas of other state cooperatives. RMEC shares the expense of its three-area winners with the statewide cooperative. Topics such as Energy Efficiency Arkansas are discussed with the students which will not only teach these students,

but will also give the students the knowledge they need to teach others. Low cost to no cost in 2011.

12) Electrical safety and efficiency training for grades 1 thru 6

Each year we go to the public schools and put on an electric safety and energy efficiency program. Most of this centers around safety because of the age group. For energy efficiency we basically tell them to turn the light switch off when they leave a room and teach their parents to do the same. The cost to RMEC for this service was approximately \$1,500 in 2011

13) Lighting athletic fields and recreational parks

Recreation is an often overlooked infrastructure item important to an area's quality of life. One of the cooperative's contributions to many area communities' recreational activities is the assistance given to lighting athletic fields and recreational parks. The Cooperative generally assists in the lighting design. RMEC also has donated labor and use of construction equipment to assist with the lighting installations. We advise to them to take the money we save them and invest it in energy efficient lighting systems. The cost to RMEC for this service was approximately \$2,000.00 in 2011.

14) Special rate for 200KWD loads

Rich Mountain Electric Cooperative's Commercial and industrial Rate offers large saving incentives to members who install a 200 kW load or greater. These saving incentives are received by demand savings. Installed measures must have the potential to go off line or be self-sponsored during the peak hours of the summer months. Rich Mountain Electric Cooperative presently has two (2) members that qualify for this rate. These two services help reduce Rich Mountains summer demands by 448 kWd and result in an annual savings to Rich Mountains membership of \$50,000.00.

15) Fair booth

Rich Mountain Electric Cooperative sets up a booth at the Polk County Fair each year. At this booth staff volunteers talk to the community about safety, energy efficiency and answer any questions or resolve any concerns that anyone might have about their Cooperative. We have a light bulb display that shows the difference in the usage of a florescent light bulb verses a conventional bulb, along with the difference of a 60w bulb and a 100w bulb. We also have brochures on energy efficiency and safety available at the booth. The time for these projects is volunteered by Cooperative staff, the booth materials and supplies were \$7,000 for 2011.

The investment Rich Mountain Electric made in 2011 for Energy Efficiency Programs was \$126,450.00. The Cost Ratio of our Energy Efficiency programs to our Operating Margins for the year 2010 was .55 or 55 percent. We have estimated that the EE Programs will save Rich Mountain Electrics members 2,913,303 kWh in 2011, which will result in the savings of \$199,744 from kWh purchased from AECC. The total kWh purchased in 2011 was 148,469,146. 2012's predicted growth from new installations is 2%. 2% times 148,469,146 kWh is 2,969,383. 148,469,146 kWh plus 2,969,383 kWh equals 151,438,529 kWh to be purchased in 2012. 151,438,529 kWh less the estimated savings from our EE Programs of 2,913,303 kWh equals 148,525,226 kWh to be purchased in 2012.

The estimated result indicates that Rich Mountain Electric Cooperative can maintain its two (2.0) percent growth in new installations with a conservative estimated growth of less than one half of one (0.5%) percent of growth in kWh's purchased. The total estimated savings to RMEC from direct results of the above mentioned components for 2011 was approximately \$200,000.00. We have also estimated a savings of \$825,000 over the past five years due to our EE Programs. This equates to over 16,000 megawatt hours that we did not have to purchase over the last five years due to our EE Programs.

Summary- Rich Mountain Electric Cooperative is a voluntary organization, open to all persons able to use its services and willing to accept the responsibilities of membership, without gender, social, racial, political or religious discrimination. We are a democratic organization controlled by our members, who actively participate in setting policies and making decisions. Our elected representatives are accountable to the membership. Rich Mountain Electric cooperatives, members have equal voting rights (one member, one vote). Our Members contribute equitably to, and democratically control, the capital of our cooperative. RMEC provides education and training for its members, elected representatives, management and employees so we can contribute effectively to the development of our cooperative. RMEC serves its members most effectively and strengthen the cooperative movement by working together through local, national, regional and international structures. While we are focusing on our member needs, we work for the sustainable development of our communities through policies accepted by our members. With this in mind, Rich Mountain Electric Cooperative is proud to conclude its Energy Efficiency and Conservation Efforts Report to the Commission.