

# Columbia Water & Light

2014 Energy Efficiency Progress Report  
*Demand Side Management Highlights*



**37,450,000**  
kilowatt hours saved

The yearly amount of electricity saved by energy efficiency program participants is equal to the power used by 3,877 homes in one year.

**2 million+**  
reached

The video series Conservation Tips has surpassed two million views on YouTube.



**\$24 million** spent

Columbia Water & Light **customers** have spent \$24 million in the local economy on energy efficiency projects since 2008.

Peak energy reduction programs can drop Columbia's load by 29,000 kilowatts. Energy efficiency contributes another 4,880 kilowatts.

**33,880**  
kilowatts dropped



**4,700+**  
educated

Over 4,700 Columbia Water & Light customers and local students were educated about energy efficiency in 2014.

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# Columbia Water & Light's 2014 Demand Side Management Report

Demand Side Management is a strategy that utilities employ to decrease or defer demand for their energy services. The purpose of this Demand Side Management Report is to state the fiscal year 2014 numbers, the cumulative total results, a description of how the energy efficiency programs operate and summarize the utility's outreach efforts.

Demand Side Management programs are designed to encourage consumers to modify their level and pattern of electricity usage. Energy efficiency programs reduce the overall electric consumption. Load Modifying<sup>1</sup> programs help control the electric load during times of peak usage, electric supply emergencies or by shifting the load to more favorable time periods.

Planning for Demand Side Management programs involves utility cost/benefit evaluations. The Integrated Resource Plan (IRP) forecasts the future cost of electricity and compares it to the cost of reducing and controlling electric demand. The theory is that a utility can reduce future power supply costs by reducing wasted energy. The energy efficiency programs with the best cost/benefit ratio were expanded by the Columbia City Council in 2008 to reach the goals of the plan. The updated IRP and the implementation plan were reviewed by the City Council in December 2013. Please contact Columbia Water & Light or visit [GoColumbiaMo.com](http://GoColumbiaMo.com) for a copy of the IRP and/or the staff IRP implementation plan for additional information.

## 2014 Summary

- In fiscal year 2014, Columbia Water & Light's energy efficiency programs saved the city 2.7 million kilowatt hours and have reduced the peak load by almost 700 kilowatts.
- From 2008 through 2014, the cumulative reduction in the electric load was 37.5 million kilowatt hours with a total peak reduction of almost 4,900 kilowatts.
- Since 2008, energy efficiency programs reduced Columbia's greenhouse gas emissions by 25,650 metric tons of Carbon Dioxide Equivalent.
- In fiscal year 2014, customers spent \$4 million in the local economy on energy efficiency upgrades with over \$24 million spent over the last five years.

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<sup>1</sup> The term Demand Response was previously used. The term for Columbia's programs was changed in this year's report to align with the Midcontinent Independent System Operator's (MISO) terms. Demand Response programs are controlled directly by MISO and Load Modifying Resources are managed by electric distribution utilities.

## Energy Efficiency Programs Overview Charts Fiscal Year 2014

Program	Participation	Expenditure	Peak Reduction	Energy Reduction
Home Performance with Energy Star	415	\$257,011	112 KW	218,290 KWh
Enhanced Home Performance	54	\$70,031	15 KW	28,404 KWh
Air Conditioner/Heat Pump Rebates	255	\$127,982	92 KW	269,025 KWh*
Residential Loans	145	\$1,420,423**	N/A	N/A
Online Energy Audit	188	\$8,100	N/A	50,760 KWh
Energy Audits	899	1 staff person	N/A	133,322 KWh
Tree Power & landscape audit	125	\$8,750	2.4 KW	159,500 KWh
Window Air Conditioner Exchange	46	\$8,780	23 KW	34,239 KWh
Lighting Incentive Program	38	\$101,615	366 KW	1,730,493 KWh
Commercial Energy Assessments	9	1 staff person	N/A	N/A
Commercial Loans	3	\$63,554**	N/A	N/A
Infrared Scans	3,986	1 staff person	N/A	N/A
City buildings	0***	grant funding	0 KW	0 KWh
Photovoltaic	12	N/A****	82 KW	110,622 KWh
Solar water	1	\$800	N/A	2,000
Audit incentives	1,077	\$231,290*****	N/A	N/A

\*Energy reductions are based on cooling degree days and usage amounts from a sample set of rebate customers.

\*\*The loan expenditures are paid back by the customer.

\*\*\*The Office of Sustainability reports this project is complete.

\*\*\*\*The cost of the solar incentives is accounted for in the renewable energy mandate cost calculations.

\*\*\*\*\*Audit incentives are part of the administrative costs and are for market transformation. Dollar figure for both pre and post assessments are combined. Please see the section for the Home Performance program for details about these expenditures.

NOTE: When the peak or the energy reduction cannot be measured or is accounted for in another area, the numbers are not included in the chart and listed as NA.

### Cumulative Energy Savings (FY2008 through FY2014)

Only programs with verifiable energy savings are detailed in this chart.

Program	Total participation	Average incentive	Total incentive	Total peak reduction	Total energy savings
Home Performance	3,303	\$529	\$1,748,131	898 KW	8,421,606 KWh
Enhanced Home Performance	62	\$1,323	\$82,027	17 KW	37,583 KWh
AC/HP rebates	1,953	\$377	\$735,802	704 KW	8,578,811 KWh
Lighting incentive*	222	\$2,625	\$582,726	2,721 KW	17,463,072 KWh
Window AC Exchange	406	\$191	\$77,382	208 KW	302,879 KWh
City buildings	30	Grant funding	Grant funding	189 KW	1,638,802 KWh
Photovoltaic	27	N/A**	N/A**	144 KW	353,154 KWh
Solar water	23****	\$730	\$16,800	N/A	664,000 KWh
Audit incentives***	7,383	\$215***	\$1,590,890***	N/A	N/A

\*The lighting incentive cumulative numbers are since the program started in FY2007.

\*\*The cost of the solar incentives is accounted for in the renewable energy mandate cost calculations.

\*\*\*Audit incentives are part of the administrative costs and are for market transformation. Dollar figure for both initial and post assessments are combined. Please see the section for the Home Performance program for details on these expenditures.

\*\*\*\*There was one solar water heater rebate before 2008 so the total at the end of FY2014 was 24.

## **Residential Energy Efficiency Program Details**

### **Home Performance with Energy Star**

The Environmental Protection Agency's Home Performance program brings existing homes up to Energy Star standards. After a detailed home assessment by a certified contractor, residential electric customers can qualify for rebates and a loan for the suggested improvements. There are incentives up to \$1,200 for air sealing, insulation, duct sealing, doors/windows and heat pumps. The incentives are based on the energy saved and the Integrated Resource Plan's utility cost/benefit. The Home Performance with Energy Star program has resulted in a savings of 898 kilowatts and over 8.4 million kilowatt hours over the life of the program.

The Home Performance program has helped the local economy by creating 35 new jobs. Before the utility started this program, there was a very limited market for energy efficiency services. In order to assist in transforming the energy efficiency market, Columbia Water & Light has offered contractor incentives. The certified contractors help the utility administer the program and provide utility data about the participating homes. In the future, these incentives could be phased out if the energy efficiency tracking software program saves contractors time and effort. The city's Information Technologies Department is currently working on developing the software and it should be phased in during 2015. Regardless of the contractor incentives, Home Performance with Energy Star is an important player in the economic development of the community.

### **Energy Efficiency Scores**

Columbia Water & Light provides documentation of Home Performance participants' efficiency improvements with two energy efficiency certificates. In fiscal year 2014, a total of 418 scores were delivered to customers. One of the certificates customers receive is the Department of Energy's Home Energy Score. This score shows a home's energy performance, much like a car's miles per gallon (MPG) rating. If two houses have the same structure and equipment, but one is bigger, the smaller house will generally receive a higher (better) score. Of the 26 participants in the pilot Energy Score program, only New Jersey Natural Gas, who serves the entire state, has scored more homes than Columbia.

After rolling out the Home Energy Score, some customers indicated that they would like to know how efficient their home was without considering the size of the home. Columbia Water & Light developed the Efficiency Score in 2013 to provide this information to the customers. The Efficiency Score indicates the percentage of a home's maximum energy efficiency potential. The maximum energy efficiency is based on recommendations that provide a 10-year payback or less. Annual energy cost is based on equipment efficiency, size of home and number of bedrooms. The certificate for this program looks similar to the bright yellow EnergyGuide label found on appliances.

VISIONING GOAL: Meets the 9.3.1 Goal & Strategy. Also, this program was specifically mentioned in the Priority Strategy 1) g.

### **Air Conditioner or Heat Pump Rebates**

Air conditioner or heat pump incentives are based on the size of the system and the SEER (efficiency rating) of the system. The amount of the incentive is based on the amount of energy saved and the utility cost/benefit as outlined in the Integrated Resource Plan. This program has high targeted energy savings due to cooling systems being one of the largest drivers of peak electric demand in the summer. This residential and the commercial rebate program has had a cumulative savings of 704 kilowatts and 8.6 million kilowatt hours since 2008.

VISIONING GOALS: Meets the 9.3.1 Goal & Strategy. This program was specifically mentioned in the Priority Strategy 1) j & k.

### **Home Performance with Energy Star Loans**

Columbia Water & Light offers residential electric customers low-interest rate loans to make energy efficiency improvements. (Solar Energy Loans are covered in a separate section.) Participants are required to have a detailed energy efficiency assessment so the maximum amount of energy savings can be achieved. The energy savings for the loan program are not detailed in this report since the energy savings are embedded in the Home Performance with Energy Star results.

Participation in the loan program on the residential side was down 20% from 2013. The highest amount of loans issued was in 2010 with 297 customers participating. Around 30% of those participating in Home Performance with Energy Star program choose to borrow money for energy efficiency improvements. National data has shown that loan customers finish more energy efficiency projects and save more energy than those that only take advantage of rebate programs.

The loan program is funded by the electric utility's designated loan fund and the money is paid back to the utility by the customers. There is limited liability to the utility since a property deed is required for all loan customers. During 2013 and 2014, the loan program had a revolving loan status since there were more monies paid back into the fund than were withdrawn.

VISIONING GOALS: This program assists customers in financing the suggested energy efficiency measures mentioned in the 9.3.1 Goal & Strategy

### **Online Energy Audit**

Columbia Water & Light started a free online energy audit and carbon calculator on the city's website in the fall of 2008. Customers can conduct an assessment and receive recommendations based on the input. There is also an energy efficiency reference library. In 2014, there were 188 customers who used this service with an estimated savings of 50,760 kilowatt hours. Updates to the software were made in 2014 and the vendor is expecting the revised online energy audit will be available in the first quarter of 2015. The new online energy audit will align more closely with Home Performance with Energy Star recommendations and requirements.

VISIONING GOALS: 9.3.1 Goal & Strategy

### **Energy Audits**

Columbia's free home evaluation provides energy and water efficiency tips specific to each location. This is an initial energy audit for some to see if it would be worthwhile to go through the Home Performance with Energy Star program. The review is a simple walk-through audit without the complete diagnostic testing provided with a Home Performance assessment. Energy savings are harder to calculate for this program since it is not as in-depth as the Home Performance with Energy Star assessment. It remains a popular program, especially with customers who want to reduce their high utility bills. There were 80 home visits completed in 2014 and 819 phone consultations. It is estimated that each home visit results in a reduction of 250 kilowatt hours a year and each phone consultation saves 125 kilowatt hours a year. In 2014 this resulted in an estimated savings of over 138,250 kilowatt hours with a minimal expenditure since one staff person administers the program.

VISIONING GOALS: 9.3.1 Goal & Strategy

### **New Home Energy Star Rebates**

This is a national program in conjunction with the Environmental Protection Agency's Energy Star program. Energy Star homes are 20% to 30% more efficient than standard homes. There have been 42 homes in Columbia that have gone through the city's program since it started in 2008. The rebate for completing the energy efficiency measures is \$1,000. Participation in this program has been small with no customers participating in 2013 or 2014. The New Home Energy Star program has lower standards for attic and duct insulation than the building codes that were revised in 2013. The Environmental Protection Agency is working on new Energy Star standards. If it is changed, the parameters of the utility's program will be changed to reflect the new standards.

VISIONING GOALS: 9.3.1 Goal & Strategy, starting this program was specifically mentioned in the Priority Strategy 1) h.

### **Tree Power**

This program promotes energy conservation through energy efficient landscaping. Customers receive a landscape audit which indicates where they should plant their free 6- to 8- foot shade tree. Three properly placed shade trees, at maturity, can reduce cooling costs by 30%. There were 125 trees distributed through this program in 2014.

Measuring the amount of energy savings is more difficult with the Tree Power program than with the Home Performance with Energy Star program or the Air Conditioner/Heat Pump rebate so advertising efforts have been concentrated on those programs over the last several years.

VISIONING GOAL: 9.3.1 Goal & Strategy

### **Low-Income Energy Efficiency**

In 2013, the Enhanced Home Performance with Energy Star program was started to increase energy efficiency for Columbia's low-income customers. The program used the Central Missouri Community Action's (CMCA) weatherization staff to implement the program. Both Columbia Water & Light and Boone Electric have provided funds for the assessments and completion of the upgrades (insulating attics, walls, rim joists, ductwork and floors over unconditioned spaces plus air and ductwork sealing). For those participating in the program, the energy savings was around 20%. Applicants have to be at 200% of the federal poverty level (or below) to participate. The program pays landlords with income qualified tenants 50% of the upgrade for single family homes and 30% for each multi-family unit. In early 2015, the CMCA stopped their participation in the program. Columbia Water & Light staff is working with the City of Columbia's Community Development office to continue the program.

VISIONING GOAL: Goal and Strategy 9.3.1

### **Window Air Conditioner Exchange Program**

To reduce summer electric bills for low-income customers that use window air conditioning units, an exchange program was started in 2007. An income qualified person brings in an older, inefficient unit and is given a new, Energy Star rated window unit provided by the utility. The Voluntary Action Center has been administering the program since 2012. There were 46 window air conditioners distributed in 2014 with a total of 406 over the life of the program. The average savings per unit is \$90 per year for the customer.

VISIONING GOAL: Goal and Strategy 9.3.1

## **Commercial Energy Efficiency Program Details**

### **Lighting Incentive Program**

Columbia Water & Light encourages commercial customers to reduce their electric usage with a \$300 per kilowatt reduction in their lighting systems. The Integrated Resource Plan identified lighting as the area where the most energy efficiency could be gained in the commercial sector. The Lighting Incentive program has provided the utility with more energy savings than any other program. In 2014, 38 customers participated with an energy savings of 1.7 million kilowatt hours. Since the program started in 2007, the total annual reduction from this program is 2,721 kilowatts and 17.5 million kilowatt hours of energy.

Customers participating in the Lighting Incentive program benefit from the reduction of their electric bills and an increase in the quality of light. The new lighting systems make it easier for workers to see and make the product look better for the customers. Testimonials about the positive aspects of the program are used in advertising as a way to drive up participation numbers. There are limited media outlets specifically for businesses so this program heavily relies on the staff's contact with the customers. Research has shown that businesses also prefer direct contact since each business needs a customized approach to energy efficiency.

VISIONING GOALS: 9.3.1 Goal & Strategy, this program also meets Priority Strategy 1) m.

### **Energy Assessments**

Columbia Water & Light provided 9 commercial energy assessments in 2014. These assessments ranged from assisting the customer in understanding their utility bills and how their business uses energy, to full ASHRAE level II energy audits. Currently there is not a measured energy savings attributed to the assessments, however participation in the lighting incentive program is helped and other industry specific energy wasting equipment can be identified and changed.

VISIONING GOALS: 9.3.1 Goal & Strategy, this program also meets Priority Strategy 1) m.

## **Commercial Loans**

Columbia Water & Light offers commercial electric customers low interest loans to make energy efficiency improvements. This program enables businesses to finance suggested energy efficiency measures recommended in the Integrated Resource Plan. The loan program requires detailed energy assessment of the building. This program is not as popular with the commercial sector as it is for the residential sector since many businesses do not own their buildings. Three loans were issued in 2014, which is lower than previous years.

VISIONING GOAL: 9.3.1 Goal & Strategy

## **Infrared Scans**

This program provides a means for commercial customers to inspect mechanical components, electrical cabinets, electrical distribution systems and building envelopes to save energy and reduce mechanical failure. There is one staff member that runs the program. He also assists the Electric Distribution Division in identifying problems on the Columbia system which improves reliability and reduces losses. Other utilities can pay for this service through the Missouri Public Utility Alliance.

In 2014 there were 3,986 infrared scans completed. There were 340 anomalies found, 189 of which were on the city's electric distribution system. The following clients were served by the Infrared Program in 2014: Columbia Water & Light electric distribution, AAF International, Pepsico, Columbia Foods, J M Eagle, Engineered Plastics, Schneider Electric, Honeywell, First State Community Bank, the Activities and Recreation Center, Parks and Recreation pools, Missouri State Teachers Association, Columbia International Church of Christ, Cornerstone Baptist Church, Music Go Round, medical office building on Keene Street, Landmark Bank, Delmar Cobble School, the Terrace, Horton Animal Hospital, three residential customers and the Partners in Education programs.

## **Ultrasonic Leak Detection Service**

The Ultrasonic Leak Detection service helps businesses that use compressed air systems detect leaks. Leaks in a system waste electricity but can also compromise how the system operates and possibly decrease productivity. In 2014, four Columbia industrial customers took advantage of this service and 100 leaks were found. It is estimated that these customers will save over \$22,000 if the air leaks were fixed.

## **Solar Programs Rebates**

Columbia Water & Light encourages both photovoltaic and solar hot water projects through electric customer incentives. The utility offers a rebate of \$500 per kilowatt for qualifying photovoltaic systems and up to \$800 in rebates for customers installing solar water heating systems. For 2014, there were twelve customers that installed photovoltaic systems and one solar water heater were installed. The costs of the rebates were included in the Renewable Energy Ordinance cost calculations so those expenses were not counted as a Demand Side Management expense.

Behind-the-meter solar systems work in many ways like energy efficiency projects. At locations with photovoltaic systems and solar water heaters, the utility does not have to provide as much power. However, only photovoltaic systems provide a reduction in peak energy use. Solar electric systems produce targeted energy savings during daylight hours, especially in summer when power costs are usually higher than average. It is estimated that photovoltaic systems can produce 20% of their rated power during the utility's peak demand periods. The energy savings from solar water heaters are not counted by the utility as a capacity reduction.

There are other utility solar projects, such as Columbia Water & Light's Solar One program, that are connected directly to the utility as a power producer and do not serve as a behind-the-meter application. For example, Solar One energy production is directly metered and accounted for separately as an electric supply for the utility. This program is not considered a source that reduces Columbia's electric demand.

## **Solar Energy Loans**

In 2014, a Solar Energy Loan program was started. Customers can receive a low-interest loan for solar water heaters and photovoltaic systems. There was no solar energy loans during 2014 although the number of customer installed photovoltaic systems grew by 40%. The first solar loan was processed in December 2014 or in fiscal year 2015.

## Grants

### Climate Showcase Communities Grant

To increase energy efficiency in the commercial sector and reduce greenhouse gas emissions, Columbia Water & Light was awarded an Environmental Protection Agency Climate Showcase Communities Grant in 2011. Energy efficiency efforts were concentrated in Columbia's downtown area and were completed in March 2013. One hundred fourteen business or building owners in The District signed up to participate. The utility compiled three years of utility data for each participant and benchmarked that data to businesses of a similar type, both nationally and locally. Next, Columbia Water & Light staff performed onsite energy audits and identified 49 projects that both needed energy efficiency improvements and had willing business owners. These projects included many lighting retrofits, HVAC systems, building envelope upgrades, commercial kitchen exhaust ventilation optimization and one apartment complex with 135 new Energy Star rated refrigerators.

The Climate Showcase Communities Grant provided \$285,000 of the project's final budget of \$741,378.94. (Note: the incentives provided by Columbia Water & Light were included in the overview charts under the utility program expenditures for each year so they are not separately noted on the overview charts at the beginning of this document.) All of this money was spent in the community so it helped the local economy. Furthermore, the combined annual savings for these customers in their utility bills is \$142,125 with an average payback period of only 2.5 years. The electric demand reduction of the energy efficiency projects is 376.52 kilowatts and 1,277,305 kilowatt hours of energy reduction. This savings is 172% greater than the goal of 470,000 kilowatt hours. The completed projects provided an estimated reduction of 1,304 metric tons of carbon dioxide.

VISIONING GOALS: This grant helps meet Visioning Goal and Strategy 9.3.1 and is mentioned specifically in Priority Strategy 1) r.

**Energy Efficiency and Conservation Block** A \$1,018,300 grant was awarded to the City of Columbia for energy efficiency improvements of city-owned buildings along with funding the Office of Sustainability. Columbia Water & Light staff helped gather data and assist the contractor during the audits that encompassed over 600,000 square feet of city-owned facilities. There is a potential savings of 338 kilowatts and almost 2 million kilowatt hours if all the energy efficiency projects are completed. In 2013, there were 3 energy efficiency projects completed with an annual estimated savings of 67.6 kilowatts and 284,831 kilowatt hours.

### Load Modifying Programs

Columbia Water & Light has initiated Load Modifying Programs designed to reduce electrical demand when needed by the utility. These programs keep the city's peak electric load below the record of 277 megawatts set on August 2, 2011. There are incentives for customers to participate in these voluntary programs.

### Load Management

Load Management is a residential and small commercial customer load modifying program. The program is intended to be utilized to reduce the need to purchase additional capacity. In 2014, the load management program cost \$4 per kilowatt/month more than market capacity. The program reduces peak electric demand by controlling air conditioning loads when the electric system load is at its highest, typically on hot summer afternoons. During peak usage periods, the Load Management switches start running one hour prior to the anticipated peak load or when the load is within five megawatts below the previous historic peak load. Participating customers receive a 3% discount on their summer electric bills. At the end of 2014, there were 19,497 switches installed on the Columbia system with an estimated sustained capacity reduction of 5.5 megawatts an hour. The switches were not used for peak electric load curtailment during 2014. A test with all of the switches operating at once occurred on August 21 at 3:30 p.m. and 4:00 p.m. The resulting load reductions were 23 megawatts and 28 megawatts respectively. Under normal circumstances all the switches are not activated at once.

### Load Shedding Program

Load Shedding is a peak electric load reduction program for large commercial and industrial customers that have demand levels of 250 kilowatts or higher during the summer. While the Load Shedding program offers an incentive that is higher than the market cost of capacity, the effects of the program are much more quantifiable than the load

management program. Incentives are paid to the customer in monthly credits, of \$3 per kilowatt, starting with the October billing. A maximum of 50% of the load is eligible for load shedding credits. The Load Shedding program was not activated during 2014. The last time the participants engaged in the program was on August 29, 2013 when nine load shedding customers reduced their electric consumption resulting in a total reduction of 3.89 megawatts.

## Training and Events

**Building Performance Institute (BPI):** BPI certification is the industry standard for home energy assessments. This certification is a requirement for becoming a certified Home Performance with Energy Star contractor in Columbia. Expanding training opportunities locally helps reduce training costs and the economy by developing new jobs. In 2014, Columbia Water & Light staff certified two new Home Performance contractors, recertified 13 contractors and trained nine people on BPI building science principles. The BPI building science principle training will be expanded in 2015 and will include relators and home inspectors.

**Power Quality Training:** Columbia Water & Light sponsored power quality training sessions for industrial/commercial customers, vendors, contractors and staff members. The goal was to provide detailed information on why potential problems occur and how to get issues resolved. Topics were: General Power Quality, Surge Protection Devices, Power Factor and Harmonics, Transformers, Grounding and Uninterruptible Power Supply Systems. There were a total of 331 people attending the Power Quality University training. Columbia Water & Light will partner with Boone Electric Cooperative in 2015 to offer the series of classes again.

**HEAL:** The Clinton Foundation's Home Energy Affordability Loan program concept was presented to 21 commercial electric customers on July 2, 2013. This is an employee benefit program to help employees be energy efficient. Regional Economic Development co-hosted the event. Employers attending the event were interested in the program and they will be approached at a later date after the program is rolled out to City of Columbia and Boone Electric employees. Currently the program parameters are being reviewed by the City of Columbia's Legal Department.

**Housing Rehabilitation Program:** This City of Columbia program is funded by the Department of Housing and Urban Development (HUD) Community Development Block Grant and HOME programs. It promotes neighborhood stability by providing funds to help low-income property owners make necessary improvements to their homes. Columbia Water & Light has helped the Community Development Department with this program by providing equipment to complete energy efficiency assessments.

**Advancing Renewables in the Midwest Conference:** On April 8, 2014, the 9th annual Advancing Renewables in the Midwest conference hosted 220 attendees. An introduction from Missouri Governor Nixon was followed by speakers from across the United States discussing the economic value of energy efficiency, Kansas City's Green Impact Zone, carbon neutrality, community solar, air conditioner tune-ups, the Iowa wind farm model, climate change, greenhouse gas implications of bioenergy and funding opportunities for rural renewable projects. The conference was hosted by Columbia Water & Light, the University of Missouri's Department of Soil, Environmental and Atmospheric Sciences and the Missouri Department of Economic Development. The 2015 conference will be held at the University of Missouri on April 6 and April 7.

**Energy Expo:** Columbia Water & Light, Boone Electric and Ameren Missouri hosted the Energy Efficiency Expo on October 4 at the Boone County Fairgrounds. In October 2014, around 350 people came to learn about making their homes more energy efficient. Attendees took advantage of the opportunity to visit with energy experts from central Missouri. There were representatives from local companies specializing in heating and cooling, insulation, lighting, windows and more. The event also featured seminars and hands-on demonstrations and exhibits.

## Education

Over 4,200 students and educators benefitted from utility educational efforts in 2014.

**Elementary:** Over 500 students learned a variety of energy related theories involving water and electricity in 2014.

- Benton Elementary STEM showcase: mini-motor/generator and simple circuits
- Fairview Adventure Club: water town display with review of a water utility

- Fun City Youth Academy: presented weekly on different topics: energy efficiency, power outages, planting the right tree in the right place and water town display with a review of a water utility
- Good Shepard Lutheran School Science Club: electrical safety, edible aquifer and simple circuit models
- Lee Elementary: Arbor Day activities included planting the right tree in the right place and held a sustainability tour of City of Columbia projects
- Parks and Recreation (science club and camps): aquifers, fossil fuels, simple circuit models
- Paxton Keeley Adventure Club: water town display with review of a water utility

**Middle School:** Over 350 students participated in Energy Choices and Saturday Science in 2014.

- Energy Choices: Each year Columbia Water & Light staff members teach Columbia middle school science students about energy efficiency. The project shows how much energy is needed to heat water for a shower and the associated cost of a shower. The students are then challenged to reduce energy consumption in their homes. The program went through some revisions in 2014 due to the large restructuring of grades/schools made by the Columbia Public Schools. Staff taught the program to 359 students at Smithton and Our Lady of Lourdes Interfaith School in 2014.
- Saturday Science: Each winter, students that have a special interest in science can enroll in the Saturday Science extracurricular learning experience. Almost 50 students from Jefferson, Oakland and private/home school students were taught science theories related to solar energy during the 2014 sessions. This was the first year the Saturday Science program included home schooled students.

**High School:** Almost 700 hundred high school students learned about a variety of utility topics in 2014.

- Bottle Battle: Created by Columbia Water & Light's Energy Educator, the Bottle Battle program teaches the principles of thermal energy, insulation and efficiency through a hands-on engineering project. Students explore different types of insulation and how well they perform over time. Students select two types of insulation to do calculations on the energy savings. The program was started in October 2013 with 50 Battle High School honors physics students. In the fall of 2014, the program was expanded and engaged 400 ninth grade students.
- Budgeting: To prepare high school students for the responsibility of paying bills, presentations were made to over 200 students at Battle, Hickman and Rock Bridge High Schools on utility billing basics. Suggestions on how to control costs through energy efficiency were also reviewed.
- Missouri Scholars Academy: Thirty-five students from this group toured the Municipal Power Plant and learned principles of energy efficiency.

**College:** Over 2,300 college students were reached through Columbia Water & Light's education program.

- MU Off-Campus Housing: Materials about how to find an energy efficient rental and rental efficiency tips were distributed to over 2,000 Housing Fair attendees. Business cards were handed out with the web contact information for the utility billing history available on the City of Columbia website. Fifteen students attended an energy efficiency presentation organized by the Off-Campus Housing organization.
- Classroom visits: Columbia Water & Light staff members presented information to about 40 students in the MU Honors energy class and the Honors Colloquium on public policy. The Energy Educator presented renewable energy information to the Environmental Leadership Office and assisted on an educational tour hosted by the MU Green Infrastructure group.

**Teacher Workshops/Educational Organizations:** The Energy Educator presented information and attended continuing education events. Over 300 educators were reached through presentations, workshops and webinars. The subject matter ranged from environmental education to low-income providers.

## Outreach

In trying to meet the needs of a diverse group of audiences, Columbia Water & Light has organized its education and outreach efforts for each subset of the target population. Many different population groups exist in Columbia's service territory, each with their own needs and opportunities. The ways of reaching each of these target groups differs according to the audiences preferred method of receiving information. Highlighted in this report are some of the main programs for 2014, mainly the no- to low-cost outlets.

**Customer Outreach Program:** To reduce electric usage in customers' homes that have higher than average consumption, a customer outreach program was started in August 2014. A list of 3,279 homes that averaged over 1,300 kilowatt hours during a summer month were identified for targeting with the Home Performance with Energy Star program. All of the customers on the list live within 1,000 feet of someone that completed the Home Performance program who achieved over a 25% reduction in their energy usage.

Two Energy Technicians and an Administrative Assistant contact customers on the outreach program customer list. The Energy Technicians visit the homes of willing participants to complete a Home Performance with Energy Star assessment. Any customer that would benefit from energy efficiency upgrades is passed along to a Home Performance contractor of their choice. If the home has a high amount of air leakage, the contractor will repeat the blower door test so each air leak can be identified for sealing. Otherwise, the customer does not have to repeat the blower door test.

Although this program was started late in fiscal year 2014, the outreach program has been successful. Reviewing the data for the first part of fiscal year 2015, 41% of those on the list have agreed to make energy efficiency improvements through the Home Performance with Energy Star program. Forty-two percent did not qualify for the Home Performance program because the houses were more efficient than the qualifications for the program and 17% declined to participate. It appears that the customer outreach program is a good method of getting customers to participate in the Home Performance program although some tweaks need to be made to the method of gathering customer names for the program so the number of customers that do not qualify is reduced.

### **Presentations:**

Home Performance with Energy Star, rebates, loans and the efficiency scores:

- Almost 500 people were presented information on these topics through local civic groups (Lions Club, Optimist Club, Rotary, Kiwanis, etc.) Over 100 people were educated about other utility topics ranging from energy efficiency to renewable energy (Examples: West Ash Neighborhood Association, Love, Inc. and Veterans United employees).

Real Estate/Housing presentations:

- A realtor's guide to energy efficiency was created to show how sales could be improved by energy efficiency. One page was devoted to showcasing energy efficiency upgrades already made to give the house a competitive edge. For houses where customers were concerned about the cost of utilities, customers could be steered towards Columbia Water & Light's incentive for energy efficiency upgrades. These handouts were distributed to all the real estate agencies in town.
- Presentations were made to over 200 real estate agents about the energy efficiency scores and how they could help with home sales. Flyers with the energy efficiency sales tips mentioned above were also distributed to these groups.

**Historical Utility Data for Rentals:** On April 21, 2014, the City Council established a policy requiring the city to provide historical utility information online for all residential rental properties, including electric and water utility cost and usage, and an indication of the heat source (electric or gas) being used, if known. The address location of the utility services is provided, but does not include customer names or contact information. To promote this new service, Columbia Water & Light staff members handed out business cards referencing the website to renters at various events. This online historical data not only provides customers in rental properties easy access to their energy usage data, but also helps prospective tenants consider the full cost of housing when making rental decisions. The data can be downloaded in a Microsoft Excel file for easy export to other applications. Users of the system are cautioned on the site that utility data can vary significantly based upon individual behaviors and choices. They are urged, if looking at a specific unit in an apartment complex that it is advisable to research the utility data for other similar units in the complex. The site also includes tips on how to find an energy-efficient rental and how to be more energy efficient once renters move in.

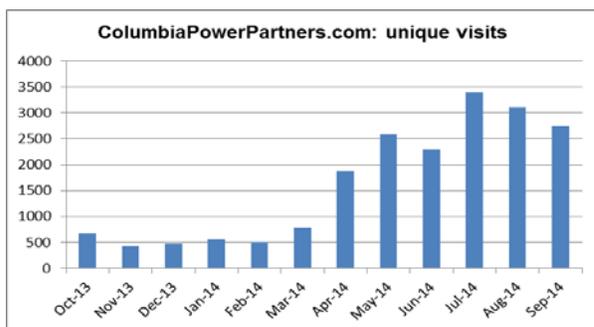
**CoMo Energy Challenge:** The Georgetown University Energy Prize challenges US communities to work together and create partnerships to develop and implement innovative approaches to energy efficiency while engaging and educating the community on energy issues. To win the \$5 million prize, a community must create an "innovative and replicable" way to reduce energy consumption. The winner will use the prize money for community energy efficiency

measures. The goal of the CoMo Energy Challenge over the next two years is to educate, excite, and engage members of the community to make lasting change, and ultimately increase Columbia residents' quality of life. The CoMo Energy Challenge is being administered by the City of Columbia's Office of Sustainability. Columbia Water & Light, Boone Electric Cooperative and Ameren Missouri are supplying energy usage data and supporting the outreach efforts of CoMo Energy Challenge.

**Events:** Columbia Water & Light had a booth and/or energy efficiency information at about 30 events in 2014. Solar energy information was also featured at some events.

**Website:** The ColumbiaPowerPartners.com site is strictly for energy efficiency and solar programs. It enables visitors to find information more quickly than on the city's website. This website address is used on outreach and marketing materials. In 2014, ColumbiaPowerPartners.com was overhauled with a new design and the pages were made dynamic so they could be optimally viewed on different electronic devices. The GoColumbiaMo.com site also has energy efficiency information along with all other utility information. The navigation of the Columbia Water & Light website was reorganized to make information easier to find.

The chart below shows that more people were driven to the ColumbiaPowerPartners.com website during times of intensive paid advertising. Not included on this chart are the visits to the GoColumbiaMo.com site which also has energy efficiency information.



**Social Media:** Columbia Water & Light expanded their social media efforts in 2014 after the Energy Educator was hired and could monitor activity on a regular basis. A calendar of energy efficiency posts was created so tips could be covered throughout the year. Staff members analyzed the best time for customer engagement. Three to six posts are made each week during lunch time and early evening hours during the week. On Facebook, the number of 'likes' grew from 228 to 465. A Twitter account started in January grew to 260 followers by the end of fiscal year 2014. Although giveaways and advertising were placed on social media, the biggest driver to social media sites is service interruptions.

**Videos:** Conservation Tips on YouTube: Conservation Tips is a monthly video program on the City Channel and YouTube. It has been a very popular show that drives people to the free energy audit program. The show is a do-it-yourself program that features easy energy efficiency projects. Although it is hard to determine how many Columbia customers are viewing the programs, the number of hits on YouTube has been surprisingly large and the comments are very positive.

- 2 million total views since May 2010
- Most viewed videos in 2014: How to Install a Window Air Conditioner (~370,000), Air Conditioner Maintenance (~350,000), Garage Door Weather Sealing Tips (~200,000), Lawn Aeration Tips (~150,000), Garage Door Insulation Tips (~115,000)

Utility Program Videos: Video features of programs like the efficiency scores and an overview of customer installed solar systems were broadcasted, highlighted on social media and placed on the websites for people that prefer to watch a video versus reading detailed information.

## Media Features

In 2014, the media covered several different energy efficiency topics. Rental energy efficiency was in the news quite a bit since one of the new apartment complexes in town had high energy bills. It gave an opportunity to pass along rental energy efficiency tips. There were media stories about Enhanced Home Performance with Energy Star, the efficiency scores, how the cold winter lead to increased bills, solar energy and the window air conditioner exchange. Energy efficiency was mentioned during any media interview about power supply, the cost of service or renewable energy stories.

**Major Initiatives:** Home Performance with Energy Star, Efficiency Score, rental energy efficiency, low-cost/free energy efficiency tips, low-income efficiency, commercial customer programs (including Power Quality classes), renewable energy (including rebates, Solar Energy Loans and net metering), energy production, electric transmission project, water related topics, school programs, increased social media presence, redesigned web sites.

**Audiences:** Homeowners, landlords, renters, low-income customers, K-12 students and teachers, business owners, realtors, industrial energy managers and many others.

**Outlets:** The following outlets were also utilized to promote all of Columbia Water & Light's energy efficiency programs:

- Public speaking events
- Booths at trade shows, conferences and community events
- GoColumbiaMo.com and ColumbiaPowerPartners.com
- Social media
- Real Estate/Housing presentations.
- City Channel (features, Conservation Tips show and informational screens)
- City Source, the city's newsletter included with the utility bills
- Media/news coverage
- Direct mail pieces
- Trade allies
- Direct customer contact
- Neighborhood Association newsletter
- Partnerships with organized groups
- City of Columbia/Water & Light reports

## Marketing

The objective of Columbia Water & Light's marketing program is to reduce electric consumption by encouraging customers to participate in the utility's energy efficiency programs.

**Referral Coupons:** Through marketing research it has been found that direct referrals from Home Performance with Energy Star customers are a valid sales tool for driving up the rate of new participants. In 2014, the Home Performance with Energy Star Referral Coupon program was started. In 2014, there were a total of 44 referrals to the Home Performance program. Money from the utility's advertising account is being used to pay for the referrals. Paying \$25 for a completed home is cheaper than mass advertising that might not lead to someone completing the program. The program is popular with customers and the participation numbers are expected to climb substantially in 2015.

Customers learn about the referral program either through a letter or during the Home Performance post assessment. A customer is given six referral allowance coupons with a \$25 value. Although these coupons are not required to complete the referral allowance process, they serve as an easy way for customers to encourage their acquaintances to participate. The coupons have the Columbia Water & Light web address and phone number listed so the customer that is new to the program will know how to get more information. It also has space for the referring customer to list their name and address so the referral allowance can be processed properly. There is a limit of six referrals for a total of \$150 paid to one household.

**Target Markets:** Residential: Residential customers represent the largest and most demographically diverse group of customers. Columbia Water & Light's energy efficiency programs are marketed towards customers over the age of

25 in the city limits (65201, 65202 and 65203) that are likely to make efficiency improvements. In 2014, some ads were placed in outlets that were more popular with women since studies have shown that they are more likely to pay bills and make household expenditure decisions. Another target market this past year was the senior citizen market. Ads are placed according to the media outlets' ability to target these customers. The customers are reached through a combination of different media outlets.

Commercial and Industrial: The energy efficiency programs for this sector are best marketed through direct customer contact with a staff member. Focus groups and outreach project results have shown that this remains the best way to engage this sector. The addition of a commercial key accounts position and an employee for industrial customer relations has helped with these efforts. Training events like the Power Quality University classes held in 2014 give employees an opportunity to establish relationships with commercial customers and share information about Columbia Water & Light's energy efficiency programs. The Columbia Business Times and the CEO magazine are the only publications where the rate of return for paid advertising is high enough to warrant the expense.

The residential ad campaign focused on spending choices. The ads asked consumers how they would rather spend their money, on fun purchases or on their utility bills. Customers were encouraged to lower their bills with the Home Performance with Energy Star program. To help finance the upgrades, the rebate and loans were mentioned in the ads. The Efficient U logo was used to tie into the previous energy efficiency ads.

A 15 second television ad can be viewed at: <https://www.youtube.com/watch?v=ZjOLfHpekNI>

**Which way would you rather spend your money?**

Lower your energy bills with the **Home Performance with Energy Star** program

- up to **\$1200** in rebates
- low interest loans to help finance the upgrades

**Columbia Water & Light**  
ColumbiaPowerPartners.com  
info@ColumbiaPowerPartners.com

**Become a more Efficient You**

**EFFICIENT**

**573-874-7325**

**Is this how you dressed INSIDE your house this winter?**

Hot and cold spots? Air leaks?  
Make your home **more comfortable** with Home Performance with Energy Star.

**Become a more Efficient You**

**Columbia Water & Light**  
info@ColumbiaPowerPartners.com

**Bedford Walk** residents **save 22%** (on average) on their utility bills through this program.

**EFFICIENT**

**573-874-7325**

**Which way would you rather spend your money?**

Lower your energy bills with the **Home Performance with Energy Star** program.

**Benton-Stephens** residents **save 28%** on their utility bills (on average).

**Columbia Water & Light**  
info@ColumbiaPowerPartners.com

**Become a more Efficient You**

**EFFICIENT**

**573-874-7325**

A targeted, direct mail campaign was sent to 6,600 residential electric customers with an active neighborhood association in 2014. The postcards showed how much their neighbors had saved through the Home Performance program. The theme of the mailer was targeted for each neighborhood. Either saving money or comfort was highlighted depending on the housing stock in the neighborhood. Although the return rate was low, the cost of the advertising was minimal.

Outreach for the commercial customers continued to mainly be driven by staff interaction in 2014. Publications like the Columbia Business Times and Columbia's CEO magazine were used for customer testimonial ads to promote commercial efficiency programs. During some months of the year, all the commercial energy efficiency programs were featured.

**Case Study:**  
**Johnston Paint and Decorating**



156 lights replaced  
\$2,931 rebate  
\$3049 estimated electric savings/year  
project payback period: less than 2 years

Johnston Paint and Decorating participated in Columbia Water & Light's commercial energy efficiency program to get the best from their lighting in terms of cost and quality. Steven Melina Murphy says, "There is a visual industry where proper lighting is an investment that really enhances our customer experience. Plus, the lighting is an investment in our building that will pay itself off through savings on our electric bill."

**Commercial Energy Efficiency Program**

Columbia Water & Light can help your business!

874-7325  
ColumbiaPowerPartners.com

"Great lighting is essential to my job. I need to be able to show customers the true colors of our products so they can best see how they will look in their own homes."  
—Vicki Pines, Interior Designer





**Case Study:**  
**Columbia Safety**

\$5,000/year in energy cost savings  
70% electric reduction  
\$22,975 in rebates

When Columbia Safety moved its company into a space that used to be a furniture store, the space had to be repurposed for safety and security. The space was filled with equipment, inventory, and workers. The lighting was not suitable for the new space. Columbia Water & Light replaced the lighting, HVAC, and other equipment.

When the lighting is done and the space is repurposed, the energy cost savings are realized. The energy cost savings are realized when the HVAC is replaced with a single unit.

**Commercial Energy Efficiency Program**

874-7325  
ColumbiaPowerPartners.com

**Advertising:** Ads are placed through a free media buying service that targets the residential electric customer demographic. Mainly the Home Performance with Energy Star and the Lighting Rebate programs were advertised. Ad placement was concentrated in the summer through the early fall for the Home Performance program since this is the period when customers get higher electric bills. Some advertising dollars were spent on Solar Energy Loans and requesting donations for the CASH and HELP utility assistance programs. It has been found that the following outlets were the best in 2014 for the residential customer demographic:

- TV: local news on NBC, ABC, CBS, FOX, NMIZ, CW, A&E, ABC Family, AMC, Bravo, Discovery, EI, ESPN, Food, HGTV, History, Lifetime, MTV, SyFy, TBS, TLC, TNT, Travel, TV Land & USA
- Gas pump displays
- Radio ads on KBIA, KFRU and KBXR
- Radio (KCMQ and KTGR) during Mizzou football and basketball games and television ads on the KMOU show "This Week in Mizzou Football"
- Print ads
  - Columbia Business Times (for commercial programs)
  - CEO (for commercial programs)
  - Inside Columbia
  - Columbia Home
- Web site ads: Google (search word, display and retargeting ads), Facebook, Pandora, the Columbia Missourian and KMIZ