



Demand Side Management and Demand Response Report
Fiscal Year 2012

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Columbia Water & Light's 2012 Demand Side Management and Demand Response Report

Demand Side Management programs consist of planning, implementing and monitoring activities of electric utilities that are designed to encourage consumers to modify their level and pattern of electricity usage. Energy efficiency programs reduce the overall electric consumption. Demand response programs help control the electric load during times of peak usage or electric supply emergencies. Energy efficiency programs also fall under the City of Columbia's Visioning Goals approved in 2008 by the Columbia City Council.

The utility cost benefit of Demand Side Management programs were evaluated in the 2008 Integrated Resource Plan (IRP). The Columbia City Council approved the expansion of both residential and commercial energy efficiency programs at that time to help meet the goals of the plan. The IRP is being updated and the Demand Side Management programs will be reviewed again in 2013. Once the plan is approved, Columbia Water & Light will have a better idea of what programs will be revised and/or added in the future.

2012 Summary

Columbia Water & Light's energy efficiency efforts have been successful and have many community benefits.

- In fiscal year 2012, Columbia Water & Light's energy efficiency programs saved the city 4,133,720 kilowatt hours and have reduced the peak load by 958.84 kilowatts.
- From 2008 through 2012, the cumulative reduction in the electric load was 29,104,905 kilowatt hours with a total peak reduction of 3,347.75 kilowatts.
- Since 2008, energy efficiency programs reduced Columbia's greenhouse gas emissions by 29,978.06 metric tons.
- In 2012, customers spent \$4.7 million in the local economy on energy efficiency upgrades with over \$15.4 million spent over the last three years.

Energy efficiency programs reduce the amount of power the utility needs to produce or purchase, they save the customers money and reduce greenhouse gas emissions. Plus the money being spent by customers for the efficiency projects are being invested in the local economy.

Energy Efficiency Programs Overview Chart

Fiscal Year 2012

Program	Participation	Expenditure	Peak Reduction	Energy Reduction
Home Performance with Energy Star	675	\$380,510	183 KW	826,748 KWh
Air Conditioner/Heat Pump Rebates (residential & commercial)	302	\$118,966	109 KW	578,028 KWh
Residential Loans	171	\$1,480,567*	NA	NA
Online Energy Audit	576	\$8,260	NA	155,520 KWh
Energy Audits	899	1 staff person	NA	146,250 KWh
Tree Power & landscape audit	80	\$4,750	1.5 KW	102,085 KWh
Window Air Conditioner Exchange	51	\$9,210	26 KW	37,960 KWh
Lighting Incentive Program	62	\$159,770	556 KW	1,628,503 KWh
Energy Assessments	55	1 staff person	NA	NA
Commercial Loans	11	\$176,750*	NA	NA
Infrared Scans	5,620	1 staff person	NA	NA
City buildings	14	grant funding	82 KW	641,638 KWh
Photovoltaic	3	\$4,167	1.34 KW	6,988 KWh
Solar water	5	\$3,200	NA	10,000 KWh
Audit incentives	1,399	\$287,920**	NA	NA

*The loan expenditures are paid back by the customer

**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 can not 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 FY2012)

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	2,288	\$500	\$1,145,119	619 KW	6,741,552 kWh
AC/HP incentive	1,402	\$354	\$496,391	507 KW	5,977,928 KWh
Lighting incentive*	136	\$3,496	\$365,656	1,952 KW	14,465,213 KWh
Window AC Exchange	316	\$167	\$52,710	159 KW	230,680 KWh
City buildings	16	Grant funding	Grant funding	107 KW	997,164 KWh
Photovoltaic	7	\$1,278	\$8,947	3.75 KW	36,368 KWh
Solar water	18	\$733	\$13,200	NA	656,000 KWh
Audit incentives*	5,038	\$219**	\$1,103,950**	NA	NA

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

**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.

Residential Energy Efficiency Program Details

Home Performance with Energy Star

This is a national program that brings existing homes up to Energy Star standards. After a detailed home assessment by a certified contractor, 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 program has been highly successful and in 2012, Columbia Water & Light received the Environmental Protection Agency's Energy Star for Homes Leadership in Housing Award for its achievements.

This single program implements most of the suggested Integrated Resource Plan's residential efficiency measures. It has resulted in a savings of 619 kilowatts and over 6.7 millions kilowatts over the life of the program. The certified contractors reported a decrease in business during the unusually warm and short winter of 2012. During the first quarter of 2012, participation in the program was down 20% and the weather was 20% warmer. The rest of the year, participation numbers were similar to the 2011 numbers. In 2012, there were 675 homes completed, in 2011 there were 907, in 2010 there were 576 and in 2009 there were 123.

The Home Energy Score was a new addition to the program in 2012. The success with the Home Performance with Energy Star program lead to the utility being selected by the Department of Energy to help with this pilot program. Columbia is one of fourteen partners in the United States to be selected. The Home Energy Score is a standardized approach to rating the structure's energy efficiency and allows participants to compare the efficiency of their home to others. Columbia had the greatest numbers of scores completed in the nation so far. In 2013, the utility will roll out a Columbia version of the score to give customers more insight into their homes' efficiency.

It is important to note the economic impact of Columbia Water & Light's energy efficiency programs. There was \$2.8 million spent by Home Performance with Energy Star customers in 2012. Along with this there have been new businesses and 45 jobs created through this program. Before the utility started this program, there was a very limited market for this type of service. 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. The Home Performance with Energy Star is an important player in the economic development of the area.

In 2012, \$74,100 was paid to contractors for 741 initial Home Performance with Energy Star incentives and \$213,820 for 658 final assessments. The contractor incentives are performance based. Columbia Water & Light splits the payment to contractors so they are motivated to complete the jobs. Final assessments are also important since they provide valuable data on the energy efficiency upgrades. As this program has evolved the contractor incentives have changed. To be eligible for incentives in 2011, participant's homes had to achieve a 15% energy reduction. Columbia Water & Light also requires that gas appliances located outside of the home's thermal envelope cause a reduction in the incentive by \$70. The contractor incentive will remain the same in 2013 since the utility will be participating in the Department of Energy's Energy Home Scoring pilot program and it requires additional work.

Columbia Water & Light is the program coordinator for the Home Performance with Energy Star program. The utility staff reports Columbia and Boone Electric's data for the program to the Environmental Protection Agency. In 2012, two Columbia certified contractors, Nemo Insulation Company and Chapman Heating and Air Conditioning, received the Century Club Award from the Environmental Protection Agency for completing over 100 homes in one year.

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

See the appendix for a chart of program incentives.

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 rebate program has a cumulative savings of 507 kilowatts and almost six 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.

Residential Loans

Columbia Water & Light offers residential electric customers low-interest rate loans to make energy efficiency improvements. 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 has continued to drop since 2010 when the number of loans was 297. In 2011 there were 224 loans and in 2012 there were 171. It is hard to draw many conclusions from these statistics since the amount of people participating in the Home Performance with Energy Star program has remained steady. The loan program still continues to be an important tool for the utility to offer electric customers. Data has shown that loan customers finish more energy efficiency projects and save more energy than those that only take advantage of the rebate program. This 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.

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 2012 there were 576 customers who used this service with an estimated savings of 155,520 kilowatt hours.

VISIONING GOALS: 9.3.1 Goal & Strategy

Energy Audits

Columbia's free home evaluation provides energy and water efficiency tips specific to each location. 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 271 home visits completed in 2012 and 628 phone consultations, which is higher than the participation rate for 2011. 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 2012 this resulted in an estimated savings of over 146,250 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. The amount of new homes being built in Columbia has gone down over the last several years so participation in this program has been small. There have been 42 homes in Columbia that have gone through the city's program. Two customers received an incentive of \$1,000 for participating in the program in 2012 which is a drop from 11 participants in 2011 and 19 in 2010.

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 tall shade tree. Three properly placed shade trees, at maturity, can reduce cooling costs by 30%. There were 80 landscape audits completed in 2012.

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. The amount of new homes being built has been lower the last several years which has also reduced participation since that used to be a targeted market.

VISIONING GOAL: 9.3.1 Goal & Strategy

Low-Income Energy Efficiency

Energy efficiency for Columbia's low-income customers has been greatly assisted over the last few years by the Central Missouri Community Action's weatherization program. Using federal funds, low-income residents in Boone County can qualify for a free weatherization program. Both Columbia Water & Light and Boone Electric have brought forward initiatives to augment the funding of this program when the federal funding runs out in 2013.

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. In 2012, the Central Missouri Community Action Agency did not have the staff to continue distributing the units to their clients. A new partnership with the Voluntary Action Center was started which was very successful. Participation in the program grew from 30 window air conditioners distributed in 2011 to 51 in 2012 which is a total of 316 over the life of the program. The Voluntary Action Center has agreed to administer the program again in 2013. 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 program ramped up considerably in 2011 and it has provided the utility with more energy savings than any other program. In 2012, there were 62 customers participating with a savings of 1.6 million kilowatt hours. Since the program started in 2007, this program has saved 14.5 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 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. The addition of a Key Accounts Representative in 2013 should help with this type of outreach.

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

Energy Assessments

Columbia Water & Light provided 55 commercial energy assessments in 2012. 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 there have been behavioral changes and some lighting upgrades completed.

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. The amount of commercial loans grew from three in 2011 to 11 in 2012.

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 2012, there were 5,620 infrared scans completed. There were 1,148 anomalies found, 805 of which were on the city's electric distribution system and 343 were found on customers' systems. The following clients were served by the Infrared Program in 2012: Columbia Water & Light electric distribution, the Columbia Energy Center, the Water Treatment Plant, Macon Public Utilities, Pepsico, Columbia Foods, J M Eagle, Engineered Plastics, Columbia College, Rainbow House, Forum Development Group, Moore & Shyrock, Studio B, Christian Science Church, five residential customers and the Partners in Education programs.

Solar Programs

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. Since 2008, \$8,947 has been awarded for photovoltaic systems and \$13,200 has been awarded for solar water heaters. For 2012, there was a 16,988 kilowatt hour reduction from solar systems and solar water heaters and a reduction of 1.34 kilowatts from solar systems.

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 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. Solar One energy production is directly metered and accounted for separately as a utility electric supply. It is not considered a source that reduces Columbia's electric demand.

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, known as The District. One hundred fifteen 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 28 onsite energy audits and identified 48 energy efficiency projects that both needed to be done and had willing business owners. These projects include many lighting retrofits, HVAC systems, building envelope upgrades, commercial kitchen exhaust ventilation optimization and one apartment complex with 135 new Energy Star rated refrigerators.

In addition to the \$27,926 spent on energy audits, a total of \$688,283 was spent to make the identified energy efficiency projects a reality. \$285,000 came from the grant funds and \$92,240 came from Columbia Water & Light and \$341,091 from the customers. 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 2.32 years. These projects will save Columbia 1,265,000 kilowatt hours—the amount used by 124 homes in a year. More than 2.8 million pounds of greenhouse gases will be saved annually.

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 Grant

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 2012, there were 14 energy efficiency projects completed. The projects ranged from lighting upgrades to upgrading the heating and cooling systems. The total estimated savings are 82 kilowatts and 641,638 kilowatt hours which will save \$61,863 annually. The energy efficiency upgrades will continue in 2013.

Demand Response Programs

Columbia Water & Light has initiated Demand Response Programs designed to reduce electrical demand when needed by the utility. There are incentives for customers to participate in these voluntary programs.

Load Management

Load Management is a residential and small commercial customer demand response program. The intent of the program is to reduce peak electric demand by controlling air conditioning loads when the cost of electricity is at its highest, typically on hot summer afternoons. Due to the cool weather, the switches were not activated in 2008 or 2009. The customer's electric discount was raised in 2009 to 5% and reduced to 3% in 2010. At the end of 2012, there were 19,829 switches installed on the Columbia system with an estimated sustained capacity reduction of 6.5 megawatts an hour. On June 28, 2012 an all-switch test was conducted and the load reduction was 26 megawatts. Under normal circumstances all the switches are not activated at once but in case of an emergency, there could be a substantial curtailment of Columbia's electric load.

Load Shedding Program

This 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 are eligible for an incentive. Credits 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. There are 24 customers participating in the Load Shedding program with an estimated capacity reduction of 4.4 megawatts.

Education, Training and Outreach

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 2012, Columbia Water & Light staff conducted additional training so the contractors could help with the Home Energy Score.

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 staff has helped the Community Development Department with this program by providing energy assessments.

Energy Management for Managers: This past year, the utility took on the challenge of creating their own Energy Management class for business managers. The curriculum provided large commercial and industrial customers the necessary tools to make informed energy efficiency improvements and an understanding of the rate structures, billing and utility terminology.

Advancing Renewables in the Midwest Conference: On March 26, 2012, the 7th annual Advancing Renewables in the Midwest conference hosted 177 attendees. Key note speaker Mark Jacobson from Stanford University spoke about how renewable energy is the foundation of a sustainable economy. Other topics at the conference were rebuilding with renewable energy in Greensburg, Kansas, Mid-Missouri's first electricity from farm waste project and the deployment of large scale solar projects in Columbia. This 7th annual conference was hosted by Columbia Water & Light, the University of Missouri's Department of Soil, Environmental and Atmospheric Sciences and the Missouri Department of Natural Resources. The 2013 conference will be held at the University of Missouri on March 28.

Energy Expo: Columbia Water & Light, Boone Electric and six other electric co-ops hosted this free event in October at the Boone County Fairgrounds. In 2012, around 500 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 more than 30 exhibits.

Energy Choices: Each year Columbia Water & Light staff members teach all of the 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. Staff taught about 1,400 students at Lange, Gentry, Smithton and Columbia Catholic School in 2012.

Calendar Contest: Each year junior high art departments work with Columbia Water & Light to produce an energy efficiency calendar. This process teaches students energy efficiency principles and markets the utility's programs throughout the year.

Saturday Science: Each winter, students that have a special interest in science can enroll in an extra curricular learning experience. 105 students from Jefferson, Oakland and West Junior Highs were taught science theories that are involved with energy production and usage in 2012.

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. In 2012, Columbia Water & Light hired the Shelton Group to help with the marketing concept. They have 14 years of experience in building utility brands, marketing energy efficiency, guiding demand response and green power programs and creating behavior change. The Shelton Group uses a proprietary approach to help define and create actionable plans that connect with the right customers at the right time. They track market perceptions about energy efficiency and sustainability every quarter to determine an effective strategy development.

The Shelton Group worked extensively with Columbia Water & Light's staff to review local survey results and demographics along with the research conducted by the firm. Statistics have shown that residential customers don't feel they have the money to make energy efficiency improvements. To overcome this hurdle with the marketing campaign, an emphasis was put on people making an investment in the future of their homes and families. After making the changes suggested during a Home Performance with Energy Star assessment, customers can expect to see improvements. Less money spent on utilities. More comfort inside the home. And, if the prospect of moving comes along, they can expect a higher home resale value.

The 2012 ad campaign was built around the key concept that Home Performance with Energy Star is a smart investment. Education is the key to making a home energy efficient. Only by learning what the home's deficiencies are can one begin to find solutions. Building on this idea, the Efficient U idea was selected as the theme which ties in with Columbia being a college town and education. The approach to the ads was that home improvements, plus energy

efficiency, equal a smart investment. The ads mentioned that up to \$1,200 in rebates were available along with low interest loans to help a customer become “a more efficient you.” The television ad can be viewed at: www.youtube.com/watch?v=wAsvDvKTfmY



Outreach for the commercial customers continued to mainly be driven by staff interaction. Restaurant and hotel focus groups have shown that this remains the best way to engage this sector. The Climate Showcase grant is a good example. City staff met with downtown business owners to encourage participation and the participation rate met the goals of the grant and drove people to participate in the utility's programs. The addition of a key accounts representative in 2013 should help with further outreach.

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. 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. Columbia Water & Light has seen some good results with direct mail campaigns but it is a challenge to identify the individuals responsible for energy efficiency decisions in the organization. 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. In 2012, the ads used testimonials about the Lighting Incentive program from local customers.

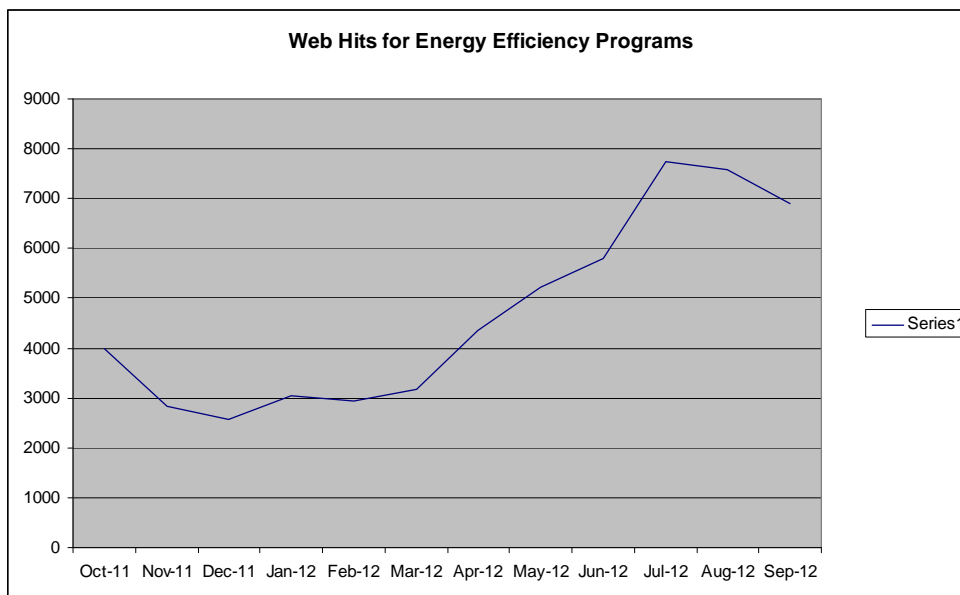
Advertising: Ads are placed through a free media buying service that targets the residential electric customer demographic. Ad placement is concentrated in the summer through the early fall since this is the period when customers get high electric bills. It has been found that the following outlets were the best in 2012 for the residential customer demographic:

- TV: local news on NBC, ABC, CBS, KMOS, FOX and other cable television outlet. Ads were also placed during the Olympic Game coverage and on gas pump displays
- Radio ads on KBIA
- Radio and television ads during Mizzou football and basketball games
- Print ads
 - Columbia Daily Tribune hot spot ads
 - Columbia Business Times (for commercial programs)
 - CEO (for commercial programs)
 - Inside Columbia
 - Columbia Home
- Web site ads: Google, Facebook and the Columbia Missourian

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

- City Source, the city's newsletter included with the utility bills
- Conservation Tips television show
- Informational screens on the City Channel
- City's website
- Public speaking events
- Press releases and news coverage
- Calendar with efficiency tips
- Direct mail pieces
- Trade allies
- Direct customer contact
- Booths at trade shows, conferences and community events

Website: The chart below shows that more people were driven to both the city's website and the ColumbiaPowerPartners.com website during times of intensive advertising. Web hits almost doubled from 2011 to 2012 during months of increased advertising.



Facebook: A Facebook page helps disseminate information to customers about energy efficiency. The Facebook page has information about the utility's programs along with energy tips.

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.

- 804,495 total views since May 2010 and 515,254 in 2012
- Most viewed videos in 2012: Air Conditioner Maintenance (123,849), How to Install a Window Air Conditioner (105,326), Lawn Aeration Tips (63,895) Garage Door Weather Sealing Tips (40,009), Window Glazing Tips (26,801)

Marketing Research: Local and national surveys are used to develop an energy efficiency marketing campaign, target specific demographic groups and select advertising outlets.

The annual Columbia Water & Light customer satisfaction survey had a number of questions dealing with demand side management programs. Here are some highlights.

- Rebates have the highest percentage of interest in both the residential and commercial sectors. Here are the percentages of customers interested in specific energy efficiency programs: free energy audits (35% residential, 26% commercial), low-interest loans (24% res, 17% com), free shade tree (36% res, 26% com), rebates for energy efficiency (46% res, 37% com), rebate for building an Energy Star home (26% res, 17% com).
- Less than one-third 32% (down from 36% in 2011) have made an energy efficiency improvement in 2012.
- Among those who have made an improvement, 18% improved Insulation, 16% improved heating or cooling equipment and 15% improved windows and doors. Additionally, 17% said they purchased a "smart appliance" and 35% made an improvement other than the choices listed in the survey.
- Of those customers who did not make improvements, 28% (up from 26% in 2011) cited their main reason for not doing so was that their building was already energy efficient, while 20% (up from 11%) said that the projects are too expensive, 10% (up from 5%) said it is too much work, and 43% (down from 58%) chose something other than the options listed.

National research supports the findings of local research while showing more insight.

- When it comes to consumption perceptions, Americans think they're using less energy in their homes than they used to – 80% (up from 74% in 2011) said they thought they used the same amount of or less energy than they did five years ago. Only 20% thought they used more. But the truth is, residential electricity demand has actually increased.
- Most consumers don't blame their increased energy bills on their own increased usage. Consumers have a tendency to avoid accepting responsibility for wasteful energy habits. Instead, people are more likely to blame outside forces over which they feel they have little or no control, which results in apathy and inaction.
- Americans also have increasingly unrealistic expectations for return on investment for energy-efficient improvements. When asked how much they would have to save each month in order to justify spending \$4,000 on energy-efficient home improvements, expectations went through the roof. The average expected savings was \$139. That works out to an annual savings of \$1,668 or a reduction of approximately 85% based on the average reported utility bill.
- Utilities must begin to approach home energy efficiency holistically and build programs that encourage multiple actions.

2013 Marketing: Due to the 2012 marketing efforts resulting in interest in the program (based off the number of web hits) but not increased program participation numbers, additional efforts will be made in 2013. A marketing campaign directed at specific neighborhood groups will be started. The city's Geographic Information Systems Department has mapped areas where the largest maximum savings has been achieved with the Home Performance with Energy Star program. Columbia Water & Light staff is also working with the city's Neighborhood Response Coordinator for outreach through their newsletter and visits to neighborhood group meetings.

Appendix

Columbia Water & Light Energy Efficiency Programs

Residential Incentives

Program	Incentive	Rebate Maximum
REBATES		
AC and heat pump (SEER 14 or above)	\$50 to \$1,600	\$1,600
Window AC units	Free exchange program for low-income	
Solar water heaters	\$400 to \$800	\$800
Photovoltaic systems	\$500 per kilowatt	\$5,000
HOME PERFORMANCE REBATES		
Attic insulation Option 1: Adding R-19 to meet R-38 standard	1 cent/R-value per sq ft (if starting less than R-27)	\$500
Attic insulation Option 2: Adding R-27 to meet R-38 standard	½ cent/R-value per sq ft (if starting at greater than R-27)	\$500
Attic insulation Option 3: Encapsulated slope, R-10 minimum, R-50 maximum	3 cent/R-value per sq ft (if starting at greater than R-27)	\$500
Wall insulation: R-13	3 cent/R-value per sq ft	\$500
Wall insulation in crawl space: R-10	5 cent/R-value per sq ft	\$500*
Floor insulation in crawl space: R-19	1½ cent/R-value per sq ft	\$500*
Rim joist insulation: R-13	\$20	\$20
Duct insulation: R-13 to unconditioned space	Prorated by % of envelope	\$300
Windows or doors	\$100/window or door (0.30 U-value)	\$500
Heat pump	\$200 (plus regular rebate)	\$200
Air sealing (minimum 0.5 ACH reduction)	Prorated \$84 per ACH reduction	\$420
Duct sealing (minimum 50 cfm reduction)	Prorated \$50 per 100 cfm reduction	\$300
HOME PERFORMANCE LOANS	See other chart	
ONLINE ENERGY AUDIT & STAFF HOME REVIEW	Free	
TREE POWER	Free 6' to 10' shade tree	

*Customer is only eligible for one of these rebates, either adding insulation to the walls or the floor of the crawl space.

Columbia Water & Light Energy Efficiency Programs

Commercial/Industrial Incentives

Program	Incentive	Rebate Max
Commercial and Industrial HVAC	\$570 to \$3,770 (based on size and EER rating)	\$3,770
Commercial and Industrial lighting	\$300/kw of reductions	\$22,500

Columbia Water & Light Loan Program

Loan parameters

Residential or Commercial electric customer

Property owner

Minimum insulation requirements

Good credit history

Detailed residential building assessment (\$250 - \$400 by an approved contractor)

ASHRAE Level II audit for commercial loans (except for HVAC)

\$15,000 maximum loan with 10 year payback for residential structures

\$30,000 maximum loan for multi-family & commercial buildings for up to 10 years

DEED of Trust required

Subordination of loan under special circumstances

Interest rates

Up to 3 years: 1%

4 to 5 years: 3%

6 to 10 years: 5%

Efficiency items eligible for loans

Required energy efficiency assessment

Air conditioner or heat pump (minimum SEER rating of 14 or 7.7 HSPF)

Natural Gas Furnace (with AC or heat pump)

Insulation (attic, walls, floor joists, ductwork)

Upgrade electric wiring to install insulation

Solar water heater

Heat pump water heater

Air sealing

Windows & doors

Energy efficiency assessments

Columbia Water & Light 2012 Demand Side Management Report

PLEASE NOTE: These overview charts do not contain all the parameters for participation in the programs.

Columbia Water & Light Air Conditioner/ Heat Pump Rebate Chart

Residential

Due to the increased costs of higher SEER units, the amount of the rebate goes up with the efficiency rating.

SEER	1 TON	1.5 TON	2 TON	2.5 TON	3 TON	3.5 TON	4 TON	5 TON
14	\$50	\$75	\$100	\$100	\$100	\$150	\$200	\$300
14.5	\$75	\$125	\$150	\$175	\$200	\$250	\$300	\$450
15	\$100	\$150	\$200	\$250	\$300	\$350	\$400	\$600
15.5	\$125	\$175	\$250	\$325	\$400	\$450	\$500	\$700
16	\$150	\$225	\$300	\$400	\$500	\$550	\$600	\$800
16.5	\$175	\$250	\$350	\$450	\$550	\$625	\$700	\$900
17	\$200	\$300	\$400	\$500	\$600	\$700	\$800	\$1000
17.5	\$225	\$325	\$450	\$550	\$650	\$775	\$900	\$1100
18	\$250	\$375	\$500	\$600	\$700	\$850	\$1000	\$1200
18.5	\$275	\$400	\$550	\$650	\$750	\$900	\$1050	\$1300
19	\$300	\$450	\$600	\$700	\$800	\$950	\$1100	\$1400
19.5	\$325	\$475	\$650	\$750	\$850	\$1000	\$1150	\$1500
20	\$350	\$500	\$700	\$800	\$900	\$1050	\$1200	\$1600

The seasonal energy efficiency ratio or SEER is defined as the total cooling output (in British thermal units or BTU) provided by the unit during its normal annual usage period divided by its total energy input (in watt-hours) during the same period.

Columbia Water & Light Air Conditioner/ Heat Pump Rebate Chart

Commercial

Due to the increased costs of higher EER units, the amount of the rebate goes up with the efficiency rating.

	11 EER	11.2 EER	11.4 EER	11.6 EER	11.8 EER	12 EER	12.2 EER	12.4 EER
6 tons	\$570	\$660	\$750	\$830	\$910	\$980	\$1,060	\$1,130
7 tons	\$675	\$775	\$875	\$965	\$1,055	\$1,145	\$1,235	\$1,315
8 tons	\$770	\$880	\$1,000	\$1,100	\$1,210	\$1,310	\$1,410	\$1,500
9 tons	\$865	\$995	\$1,125	\$1,245	\$1,365	\$1,475	\$1,585	\$1,695
10 tons	\$960	\$1,110	\$1,250	\$1,380	\$1,510	\$1,640	\$1,760	\$1,880
11 tons	\$1,055	\$1,215	\$1,375	\$1,525	\$1,665	\$1,805	\$1,935	\$2,065
12 tons	\$1,150	\$1,330	\$1,500	\$1,660	\$1,820	\$1,970	\$2,120	\$2,260
13 tons	\$1,245	\$1,435	\$1,625	\$1,795	\$1,965	\$2,135	\$2,295	\$2,445
14 tons	\$1,350	\$1,550	\$1,750	\$1,940	\$2,120	\$2,300	\$2,470	\$2,640
15 tons	\$1,445	\$1,665	\$1,875	\$2,075	\$2,275	\$2,465	\$2,645	\$2,825
16 tons	\$1,540	\$1,770	\$2,000	\$2,210	\$2,420	\$2,630	\$2,820	\$3,010
17 tons	\$1,635	\$1,885	\$2,125	\$2,355	\$2,575	\$2,795	\$2,995	\$3,205
18 tons	\$1,730	\$1,990	\$2,250	\$2,490	\$2,730	\$2,960	\$3,180	\$3,390
19 tons	\$1,825	\$2,105	\$2,375	\$2,635	\$2,875	\$3,115	\$3,355	\$3,575
20 tons	\$1,930	\$2,220	\$2,500	\$2,770	\$3,030	\$3,280	\$3,530	\$3,770

These rebates are for prepackaged & split systems.