Strategies

Monthly Member Newsletter

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Letter from the President & CEO

Meg Matt

New Year Resolutions that are Worth it!

Are you one of the many millions of people who make a New Year resolution only to break it after a few months, weeks or days? It's only natural to think about a new year in terms of new goals and commitments. Beyond the typical resolutions of losing weight, exercising more or giving up a bad habit like smoking, have you thought about what you want to do differently with your career this year?

I'd like to challenge you with a few New Year's resolutions that could make a huge difference in your working life:

- **Take five minutes a day to catch up on industry news**. AESP board member Dan Violette made this suggestion at an AESP conference many years ago, and I've tried to take more time to keep current on issues affecting our industry.
- **Invest in keeping your professional network alive and well**. It's easy to overlook the care and feeding of your professional network. Take a few minutes a week to reach out to a colleague and touch base. Social media sites liked LinkedIn make this even easier. A strong network of trusted advisors is an invaluable resource. One great way to build your network is to join an AESP Topic Committee (shameless plug #1).
- **Read *Strategies***. (Shameless plug #2!) AESP members rate *Strategies* as one of their most valued member benefits. It's full of timely industry news (see my first resolution!) and articles contributed by AESP members. And while you're at it, visit the AESP Web site and click on a few of our "members only" tools like the Resource Library and professional directory.
- **Be a mentor**. Whether you join your organization's formal mentoring program, or reach out to share your knowledge with someone new to your department, company or the industry, mentoring can be immensely satisfying. Nearly half of the baby boomer generation will be retiring in the next five years, which means our industry will be losing a significant number of talented people. "Pay it forward" by sharing what you know with someone new to our industry.
- **Turn off the lights when you leave your office or conference room**! How can we be in this business and not include this on the list? Have resolutions of your own to share? Join AESP's Facebook and let us hear from you!

Have a successful, happy and healthy 2011, and I look forward to seeing you in Orlando at AESP's 21st National Conference & Expo!

January 2011

Please email feedback on Strategies to kisha@aesp.org

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Upcoming Events

Brown Bags

February 10, 2011
EISA: The End of Residential Lighting Programs

If you would like to organize a Brown Bag, please contact Kisha Gresham at kisha@aesp.org.

AESP Training Courses

January 17, 2011
Overview of DSM

January 17, 2011
Intro to The Principles of Evaluation, Measurement & Verification (E M & V)

January 20-21, 2011
Elements of Marketing your Energy Efficiency Program

January 20-21, 2011
P2 - Level II DSM

If you would like to schedule an onsite training please contact Suzanne Jones at (480) 704-5900 or suzanne@aesp.org. For more information about the AESP Institute, click

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Featured Articles

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Stimulus News

The following executive summaries of current news items were written for Strategies after being compiled from various news sources.

Renewable-Energy Program Has Chance of Extension

A federal stimulus program that has helped keep renewable-energy projects afloat during the recession received new life despite industry fears that it might become a casualty of partisan bickering in Congress. In a last-minute push, a Senate committee cleared the way for congressional approval to extend the Treasury Department's 1603 cash grant program, which has funneled roughly $18 billion into nearly 1,500 wind and solar projects. The program, which covers up to 30 percent of the cost of renewable-energy projects such as solar-panel installations, was set to expire by the end of 2010. The subsidy is lumped into the larger tax package passed by Congress in its lame duck session. Installers of thousands of renewable-power projects in the pipeline — including small rooftop solar-panel installations on suburban homes and sprawling and remote wind-turbine farms — will be able to tap the funds in 2011. Some observers worry that the renewable industry could be too dependent on government funding if the expiration of one program could cause this many problems. However, industry officials say they do not rely on the funding, but instead are using it to get through the poor economy.

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From "Renewable-Energy Program Has Chance of Extension"
Los Angeles Times (12/15/10) P. B1 Hsu, Tiffany

here.

Conferences

January 17-21, 2011
AESP's 21st National Conference & Expo
Orlando, FL

May 16-19, 2011
AESP's Spring Conference: Program Implementation and Marketing
Atlanta, GA

October 3-6, 2011
AESP's Fall Conference
Dallas, TX

AESP is a member-based association dedicated to improving the delivery and implementation of energy efficiency, energy management and distributed renewable resources. AESP provides professional development programs, a network of energy practitioners, and promotes the transfer of knowledge and experience.

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Submissions are due by the 12th of each month

Power Bill a Click Away

Customers of EPB - a non-profit power provider for the City of Chattanooga customers - could be seeing their energy usage and its associated costs on their television and computer screens by next spring. The utility is working with Alcatel-Lucent and Microsoft to use EPB's fiber-optic network and its smart meters to let customers see data usage in real time. "We're getting ready to go through an upgrade in the spring that should give us some new capabilities to allow customers to see their power bills on their TV screen or on the Web," says EPB's Katie Espeseth. "We're going to be the first company in the country to offer this service." EPB has added telephone service to its electricity offering and recently included residential video and Internet services in 2009. The company has hooked up more than 19,000 homes and expects to reach 20,000 residential and 2,500 business customers by the end of 2010. EPB is currently about five months ahead of its original business plan. The company also has a gigabit Internet service that has helped attract companies in Chattanooga, Tennessee. EPB has been able to develop these upgrades due to a $111.5 million federal stimulus grant, which has allowed the company to lay more than 5,000 miles of fiber-optic lines and install interactive electric meters for all of its customers by 2012. Bell Laboratories is helping EPB come up with technologies to read and display energy usage information from meters every 15 minutes to all customers served by the utility. These changes will enable customers to better monitor their energy usage and allow them to make changes to more efficiently use their power and lower their bills.

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From "Power Bill a Click Away"
Chattanooga Times Free Press (TN) (12/03/10) P. A1 Flessner, Dave

Industry News

The following executive summaries of current news items were written for Strategies after being compiled from various news sources.

Lawmakers Back Plan to Scale Up Energy Efficiency

The Wisconsin Joint Finance Committee on Dec. 14 adopted a proposal to collect more money from utility ratepayers in order to expand the incentives to make businesses and homes more energy efficient. The higher spending in the near term is projected to deliver savings to utility customers as they take advantage of stepped-up incentives to reduce energy waste, according to projections by the Wisconsin Public Service Commission (WPSC) and the energy efficiency research group Energy Center of Wisconsin. The proposal will enable the WPSC to collect more money on electricity bills beginning in 2011. The $20 million increase in 2011 will raise $120 million for the state's Focus on Energy program. State Sen. Mark Miller (D-Monona), co-chair of the Joint Finance Committee, says the goal of the expanded funding is to deliver higher savings over time to utility ratepayers. The Energy Center's recent energy efficiency study concluded that tripling funding for energy efficiency would deliver more than $1 billion in savings for ratepayers, he notes. “These are the levels of investment where we can achieve $1.50 to $3 in savings for every dollar that's invested,” Miller says. Keith Reopelle, senior policy director at the environmental group Clean Wisconsin, says the vote is a strong endorsement for energy efficiency and for a program that has delivered a 220 percent return on investment on the dollars it has spent so far. “Focus on Energy is a highly successful program with a proven track record of reducing energy bills, creating jobs, and helping protect our environment,” Reopelle says. “This program has helped Wisconsin businesses and homeowners save hundreds of millions of dollars, and the expansion approved today will ensure that even greater savings are realized.” Under the proposal, the WPSC is setting targets for reducing energy use and increasing funding for energy efficiency to help meet those goals. Focus on Energy reallocated its budget this year to meet strong demand for its programs and incentives from businesses, which receive most of the incentives for energy efficiency.

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From "Lawmakers Back Plan to Scale Up Energy Efficiency"
Milwaukee Journal Sentinel (12/14/10) Content, Thomas

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San Diego-Area Utility Constructing New 'Energy Innovation Center'

The San Diego Gas and Electric Company is creating the Energy Innovation Center to promote the best green practices to area businesses and residents. The 27,000-square-foot building that will house the center is due to open in the spring of 2011, and it is being remodeled to meet the U.S. Green Building Council's Platinum LEED certification, the highest level of certification awarded for energy efficiency. The center will offer seminars, training programs, demonstrations, and certification programs to foster cost-effective energy efficiency and the creation of green jobs in San Diego. “This center will provide information and tools for businesses and residential customers to learn more about how to use energy more efficiently, save money and help the environment,” according to Hal D. Snyder of SDG&E. In addition to meeting space, the building will have a "Smart Home" demonstration and electric vehicle charging station. “We are looking forward to using the center as a strategic resource for our members and the local restaurant industry in general to share ideas and learn practical applications of the latest energy-efficient equipment,” said Katharine Hansen, director of local government affairs for the California Restaurant Association. “This will be a great forum for showing off some of the innovative products and solutions coming out of San Diego-based companies. The center will serve as an important resource for our robust and growing clean-tech cluster of more than 750 companies,” says Lisa Bicker, president of Clean Tech San Diego.

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From "San Diego-Area Utility Constructing New 'Energy Innovation Center'"
Solar Industry (12/10)

PSC Orders Energy Efficiency Measures

After two years of exhaustive research, hearings, technical conferences, and legal briefings, the Arkansas Public Service Commission has issued 10 orders aimed at promoting energy efficiency and exploring advanced energy technologies for Arkansas electric and gas utilities. The orders are part of a comprehensive Sustainable Energy Resources Action Plan for Arkansas. The orders remove disincentives to investor-owned utilities to pursue energy efficiency programs. In addition, they allow large commercial and industrial customers to direct their own energy efficiency programs. The orders mandate independent monitoring of these programs to ensure their success.

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From "PSC Orders Energy Efficiency Measures"
Arkansas Times (12/10/10) Brantley, Max

Money Starts to Flow for Efficiency

Businesses, residents, and organizations in Massachusetts are reaping the benefits of a new state initiative to significantly expand funding of energy efficiency projects by state utilities. The Massachusetts Department of Public Utilities approved a plan early in 2010 under which investor-owned electric and natural gas utilities committed to allocating $2.2 billion over three years in programs to help their customers reduce their energy use. The plan requires the investor-owned utilities to scale up their energy efficiency programs to reach greater numbers of customers. Those programs provide for free energy audits and incentives to purchase and install high efficiency lighting, appliances, heating and air conditioning systems, and insulation. The utilities also committed to stepped-up outreach efforts to educate consumers about the assistance available. As part of that goal, the utilities have launched a revamped website, www.masssave.com, that is intended to serve as a common portal into the various programs. Utilities are able to recoup their investment, primarily through rate charges on customer bills. State officials note that the larger availability of resources for energy efficiency — until now, about $125 million to $130

million a year was generated for such projects from rate charges — will provide savings to customers taking advantage of them. In one example, the owners of the Viewpoint Apartments in Haverhill, Mass., received funding from National Grid for a recent project to replace the existing lights in its 120 units, common areas, and exterior spaces with more energy efficient ones. The utility also provided rebates to help fund the replacement of 30 refrigerators with more energy-efficient ones at the converted mill property on Washington Street. "It's a good program," says Wayne Simpson, who serves as director of maintenance for the property owner, Atlantic Management. "It's definitely saving us a lot of money and it didn't hurt one bit in terms of disruption to tenants and the building overall."

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From "Money Starts to Flow for Efficiency"
Boston Globe (12/02/10) Laidler, John

Geothermal System Helps Home Achieve Net-zero Energy Usage

Vision Zero is a net-zero energy home in Michigan designed and built by Dow Chemical and Cobblestone Homes. The project utilizes a geothermal heating and cooling system; solar thermal system for domestic hot water; photovoltaics to collect energy; and an energy recovery ventilation system to ensure clean, healthy air. The home will produce as much energy as it consumes, selling any extra energy it does not use back to the utility via net metering. Melissa Wahl, co-owner of Cobblestone Homes, says a geothermal system was chosen to heat and cool the house because in addition to consumer interest and energy efficiency, there are incentives for installing a geothermal system — such as the 30 percent tax credit homeowners can receive on the installation of such a system. The solar thermal system by Enerworks was selected to show that solar can work in a cold climate such as Michigan. Solar panels are on the south side of the house's roof, and the unit works with the solar thermal tank and electric hot water tank. With a desuperheater, the system captures the unwanted heat from the home, using it to preheat water in a storage tank. The electric hot water tank serves as the primary holding tank, so the geothermal and solar tanks are not competing with one another, which helps conserve energy.

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From "Geothermal System Helps Home Achieve Net-zero Energy Usage"
ContractorMag.com (12/02/10) Roulo, Candace

Regulatory Options for Feed-in Tariffs

Feed-in tariffs (FITs) have been used extensively in Europe to boost renewable generation markets, especially solar power. Some U.S. states are interested in using FITs to promote certain energy sources, but the Federal Power Act prevents this because the federal government has the ability to regulate the power sold by generators to a distribution utility for its customers. A recent U.S. case exemplifies the tension between these states and the government. The case revolved around a FIT requirement for utilities to buy power from cogeneration facilities at incentive rates set by the California Public Utilities Commission (CPUC). The CPUC asked the Federal Energy Regulatory Commission (FERC) to ensure that the FIT program was not taken over by federal law. The CPUC said that it was not setting a price for wholesale power, but was only making sure that its utilities were offering to purchase power from cogenerators at the price set by the CPUC. FERC previously argued that the CPUC was setting prices for the power sold by its preferred generators; and the commission decided that the FIT program was not allowed, as it created wholesale pricesetting, which was supposed to be FERC's job. However, FERC said that it could be approved if the program was aligned with the Public Utility Regulatory Policies Act (PURPA). This allows utilities to buy power from "qualifying utilities at rates that are not higher than a utility's avoided costs." It seemed that it would be difficult to decide whether power from different resources could be considered "avoided costs," but FERC decided that when a state had a utility get a certain amount of energy from generators with certain characteristics, those could be considered an avoided cost for the procurement requirement. However, using PURPA as the base for FITs has its limits. The resources must be cogeneration, renewable, biomass, waste, or geothermal that are considered to be FERC's definition of a FQ. The state must be able to show a relationship between the rate and the costs a utility would avoid by purchasing power from that class of resources. The FIT can only be used where utilities must legally buy power from QFs. There could be other types of non-PURPA methods for states to avoid dealing with the preemption of FIT programs; but regardless of whether FITs are the right way to use generation sources, states must properly structure its programs.

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From "Regulatory Options for Feed-in Tariffs"
Power (12/10) Vol. 154, No. 12, P. 26 Gish, Brian R.; Mitchel, James K.

Model Building Code 30 Percent More Energy Efficient

The predicted energy efficiency of homes and commercial buildings will be increased by 30 percent over ASHRAE Standard 90.1-2004 thanks to changes made to the International Energy Conservation Code (IECC). The changes were approved in October 2010 and will be available for jurisdictions to adopt in April 2011. A joint proposal developed by the New Buildings Institute, The American Institute of Architects, and the U.S. Department of Energy prompted many of the changes relevant to commercial buildings. The new requirements include the addition of a continuous air barrier, HVAC economizers in more climate zones than in the old code, and lighting control systems that respond to daylight and occupancy needs. IECC is also now requiring basic commissioning for building systems to ensure they are running at peak efficiency. Meanwhile, the energy chapter of the International Residential Code has been replaced with the residential components of IECC. Additionally, residential requirements in IECC have been adjusted to include increased window performance, increased insulation requirements, better duct-sealing measures, and greater lighting efficiency. The result is perhaps the largest improvement in energy efficiency ever achieved in a single code update. "I have never seen a larger single stride taken for energy efficiency," says Dick Meyer, building codes program director at the Institute for Market Transformation. The advocacy group Architecture 2030 points out that having the code requires 30 percent improvement over ASHRAE 90.1-2004 aligns it with the 2030 Challenge's 2006 goal of 50 percent energy savings.

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From "Model Building Code 30 Percent More Energy Efficient"
GreenSource (11/30/10) Wendt, Allison

Building Tighter Envelopes Yields Efficiencies

Structural insulated panels (SIPs) can support a number of green building goals, including energy efficiency, indoor air quality, materials use, and renewable resources. SIPs can cut heating and cooling requirements by up to 60 percent by creating a tight building envelope and minimizing thermal bridging. A tight envelope also helps block out airborne irritants and pollutants, while building in a controlled environment enables SIPs to make better use of materials and reduce scrap. SIP construction is about 15 times more airtight than stick framing, according to research performed by the U.S. Energy Department's Oak Ridge National Laboratory. In addition, SIPs offer about 47 percent more heat-flow resistance than stick construction for walls of comparable thickness. SIPs possess high allowable axial loads and can be employed as freestanding structural elements or incorporated into other structural framing systems. SIPs accommodate high transverse loads and can be installed in big sections in roofing projects. SIPs do not need additional structural framing in many applications thanks to their structural self-sufficiency.

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From "Building Tighter Envelopes Yields Efficiencies"
Structural Engineering & Design (12/10) Vol. 11, No. 11, P. 30 Pasma, Joe

Baked-In or Decoupled?

An assessment of natural gas and electric rate-case data over the past 12 months indicates that state utility regulators are finding it difficult to balance the interests of ratepayers with those of investors. A key factor in many cases was a reduction in actual retail energy sales. This was blamed on the sluggish economy and initiatives to promote conservation and energy efficiency. Decoupling efforts may prevent such shortfalls because they disconnect energy sales from rate case revenue obligations. However, some point out that decoupling shifts rate case risk from investors to customers, prompting some consumer advocates to say there should be a downward adjustment to the authorized target rate for return on equity (ROE) for investor-owned utilities. In Maryland and the District of Columbia,

regulators implemented downward adjustments of 50 basis points in electric rate cases for PEPCO and Delmarva Power & Light. The aim was to take into account the fact that decoupling usually reduces investor risk. However, the Michigan Public Service Commission did not reduce the approved ROE for Detroit Edison, which launched a pilot program for revenue decoupling, because of uncertain economic conditions in the utility's service area that could pose challenges for the utility.

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From "Baked-In or Decoupled?"
Public Utilities Fortnightly (11/10) Vol. 148, No. 11, P. 20 Cross, Phillip S.

Envision: Charlotte Created to Bring Energy Efficiency to the Urban Core

Duke Energy, Cisco, and Charlotte Center City Partners have announced the establishment of Envision: Charlotte, a first-of-its-kind public-private partnership to make commercial structures in Charlotte, N.C.'s urban center more energy efficient. A central focus of Envision: Charlotte is to mitigate energy that is misused in the city's commercial buildings by using new technologies to increase energy efficiency and prompt changes in consumer behavior. The initiative will aim to partner with the owners of roughly 60 commercial establishments who operate more than 15 million square feet within the I-277 inner-belt loop. The partnership will rely on a combination of digital smart grid, building automation technologies and innovative energy tracking devices to give near-real-time information about the buildings' collective energy use to building owners and office workers. It also will suggest steps office workers can take to mitigate energy consumption.

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From "Envision: Charlotte Created to Bring Energy Efficiency to the Urban Core"
Transmission & Distribution (11/10) Vol. 62, No. 11, P. 14

Featured Articles

Featured Articles


Steven Braithwait


Dan Hansen

Demand Response of Commercial and Industrial Customers – Recent Evidence from Pricing and Bidding Programs in California
By: Steven Braithwait and Dan Hansen, Christensen Associates Energy Consulting

Interest continues to grow regarding the ability of demand response (DR) to provide a reliable resource at times of capacity constraints. Numerous papers and reports have summarized the performance of a range of pilot programs targeted at *residential customers*, involving dynamic pricing such as critical peak pricing (CPP), real-time pricing (RTP), and peak-time rebates (PTR). However, information on the performance of such rates and programs for *commercial and industrial* customers is much less widely available. Fortunately, several years of load impact evaluations of nonresidential DR programs for the three large investor-owned utilities in California – Pacific Gas and Electric (PG&E), Southern California Edison (SCE), and San Diego Gas and Electric (SDG&E) – have produced a wealth of information on how those customers respond to dynamic pricing and DR program incentives. This article summarizes key findings and insights from the most recent evaluations that Christensen Associates Energy Consulting has conducted for the California utilities.

The primary DR programs offered by the utilities include three general types: CPP (beginning as voluntary rates, but transitioning to default rates), demand bidding programs offered by third-party DR aggregators (including the statewide Capacity Bidding Program, or CBP, and individual aggregator contracts), and demand

bidding programs offered to individual customers (Demand Bidding Program, or DBP).[1] CPP events are announced on a day-ahead (DA) basis, while the demand bidding programs generally offer both *day-ahead* and *day-of* (DO) options.

The Aggregator bidding programs offer up-front capacity payments and have penalty provisions for nonperformance, while DBP bidding is voluntary, and customers receive energy payments for performance during events and face no penalties for nonperformance. The various rates and programs were offered to large customers (those with maximum demand greater than 200 kW) first, following installation of hourly interval meters. The programs are transitioning to smaller customers as smart meters continue to be installed for customers of 20 to 200 kW and smaller.

As of the summer of 2009, enrollments in each of the various programs generally ranged from a few hundred to more than a thousand customer accounts (enrollment in SDG&E's new default CPP rate was nearly 1,600), where the average customer size typically ranges from about 200 to 500 kW. Enrollment in the DO options of the Aggregator programs is generally much larger than enrollment in the DA options, presumably due to larger credit payments. Total enrollment in the Aggregator programs exceeded 4,000 customer accounts, while more than 2,700 customers were enrolled in CPP.

Estimated Load Impacts

Average hourly load impacts during events for the DO versions of the Aggregator managed programs (including the statewide CBP program and the contract-based aggregator programs) totaled nearly 210 MW, while those for the DA versions accounted for approximately 75 MW. Load impacts as a percentage of reference loads were impressive, typically ranging from 20 to 30 percent. An interesting observation on the overall load impacts concerns their concentration; a relatively small percentage of customers (4 to 20 percent) typically accounted for 50 to 60 percent of the total load impacts. Part of the reason for this result is that those customers were larger than average, accounting for 20 to 30 percent of the total load in the various programs. However, as indicated by the difference between the percentage load impacts and total load, these customers were twice as responsive as the remaining customers.

The large number of participants in the Aggregator programs, as well as their ability and willingness to reduce load during events, has important implications for the load impact findings for CPP. That is, while the CPP load impacts were relatively large and consistent across events, they would certainly have been larger had the Aggregator programs not been available to take potential enrollees from the CPP rates. Table 1 summarizes enrollment, average hourly reference loads and estimated load impacts, and percentage load impacts for the three utilities' CPP rates.

Table 1: Average Hourly CPP Loads and Load Impacts, by Utility
Average 2009 Event

Utility	Customer Accounts	Estimated Reference Load (MW)	Observed Load (MW)	Estimated Load Impact (MW)	% Load Impact	Estimated Load Impact per Customer (kW)
PG&E	642	256	247	8.4	3.3%	13
SCE	476	130	106	24.6	18.9%	52
SDG&E	1,576	419	396	23.3	5.6%	15
Total	2,694	805	749	56.3	7.0%	21

The three programs combined to provide average hourly load impacts of more than 56 MW. Differences across programs in the total, per customer, and percentage load impacts are due largely to differences in the makeup of customers, which are in turn due in part to differences in rate design. For example, SCE offered one optional rate that included a large discounted demand charge in return for a relatively high CPP event price and thereby attracted a number of large manufacturing customers who were very price responsive. In addition, SDG&E attracted a number of municipal water utilities that have highly flexible loads, while PG&E enrolled large numbers of office buildings.

Similarly to the Aggregator programs, CPP load impacts were concentrated in a relatively small number of customers. For example, the top 5 percent of customers at each utility accounted for 55 to 75 percent of the load impacts while accounting for only about 15 percent of the load. Another interesting finding had to do with the relationship between SDG&E's CPP customers' load impacts and their choice regarding Capacity Reservation

Level (CRL), which allows them to pay to protect certain portions of their load from exposure to CPP prices. We found that those customers who chose to reduce their CRL from the default level of 50 percent (often to zero) produced larger load impacts than those who kept the default level.

As part of these evaluations, we were also asked to examine the effectiveness of automated demand response (Auto-DR) technology for those customers who had acquired that technology through special incentive programs. The results were mixed, in large part due to small and diverse samples of participating customers, which made it difficult to infer incremental load impacts from available interval load data.

Looking Forward

Our understanding is that enrollments in the Aggregator programs are expected to remain relatively stable over the next few years, while enrollment in CPP has already grown and is expected to increase substantially in the transition to default rates. For example, SCE defaulted approximately 4,300 customer accounts to CPP in the fall of 2009, while PG&E moved 1,660 accounts to PDP in the spring of 2010.

Changes are planned for the CPP rates at each of the utilities over the next few years. SDG&E will expand its default CPP rate to medium-size customers with maximum demand between 20 and 200 kW as installation of smart meters expands in 2012 and 2013. SCE has proposed to expand default CPP to customers of less than 200 kW and to offer a Capacity Reservation option to CPP participants. Finally, PG&E plans to expand default PDP to smaller customers in late 2011 as additional smart metering is rolled out.

In states other than California, increased availability of smart meters through smart grid investments will make dynamic pricing for commercial and industrial (as well as residential) customers more feasible than it has been historically. However, current discussions about demand response still seem to focus largely on DR bidding programs arranged by DR service providers and run through regional ISO/RTOs, rather than dynamic pricing offered by utilities.

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[1]*As PG&E transitions to default CPP, it is re-naming the rate Peak-Day Pricing (PDP). It is also transitioning DBP to PeakChoice, a flexible bidding program with a variety of notice and payment options.*

Residential Electricity Demand Response Programs: A Review
By: Ken H. Tiedemann, BC Hydro

Introduction

In efficient markets, prices and quantities respond to changes in demand and supply conditions so that there are no shortages and so that prices reflect marginal costs of supply. Since these market conditions are often not met in residential customer electricity markets, this suggests that demand response programs may increase both economic efficiency and customer welfare. The first residential demand response programs were time-of-use rates, and these were followed by critical peak pricing, and then by incentive measures, including direct load control. This article provides a review of residential demand response programs. A preferred means of understanding the results of diverse programs is to conduct a meta-analysis, which is a rigorous statistical review where all programs are compared on the basis of the same metric, called the effect size, which for this review is the percentage change in peak consumption. The findings of this work should be useful in the design, implementation, and evaluation of future residential demand response programs.

Demand Response Activities

Demand response activities are often divided into two groups: price-based demand response and incentive-based price response. In its 2006 study of the benefits of demand response programs, the United States Department of Energy (DOE) noted that “price-based demand response refers to changes in usage by customers in the prices they pay and

include real-time pricing, critical peak pricing, and time-of-use rates" while "incentive-based demand response programs…give customers load-reduction incentives that are separate from, or additional to, their retail electricity rate, which may be fixed (based on average costs) or time varying." The most widely used residential demand response activities include time-of-use rates, critical peak pricing, and enabling activities. With time-of-use rates, customers face different prices per kWh during different blocks of time. With critical peak pricing, which is almost always layered on top of a time-of-use rate structure, customers face very high prices for a limited number of critical events per year, when the system is challenged to meet the load. With enabling activities, the utility provides or subsidizes load control devices such as timers on air conditioners and water heaters.

Literature Review and Data

A comprehensive literature search identified 34 peer-reviewed demand response programs with information suitable for inclusion in a meta-regression analysis. Sources consulted in the literature search included published surveys of demand response programs, the Social Science Research Network database, and the American Economics Association database. To be included in this analysis, a study had to meet the following criteria: (1) the study was published in a peer-reviewed journal or included in a peer-reviewed survey article; (2) the study included a credible evaluation methodology such as a randomized controlled experiment; and (3) the study included information on the percentage change in peak consumption, voluntary or mandatory rate, presence of time-of-use rate, presence of critical peak pricing, peak to off-peak price ratios, and presence of enabling technology. Summary information was extracted on a range of program characteristics and program outcomes, with the information used for a basic comparison of demand response experiments and to estimate a series of regression models.

Method and Results

Table 1 summarizes the percentage reduction in peak consumption for four different types of demand response experiments: (1) time-of-use rates without enabling technologies; (2) time-of-use rates with enabling technologies, (3) critical peak pricing without enabling technologies, and (4) critical peak pricing with enabling technologies. As Table 1 shows, adding enabling technologies and critical peak pricing to the basic time-of-use rate materially increases the size of the reduction in peak consumption.

Table 1. Percentage Reduction in Peak Consumption by Type of Experiment

	Mean	Range
Time-of-use rate without enabling technology	12.0%	0–28%
Time-of-use rate with enabling technology	19.3%	7–29%
Critical peak pricing without enabling technology	19.8%	12–31%
Critical peak pricing with enabling technology	28.2%	9–47%

For the regression analysis, the outcome variable was the percentage reduction in consumption during the peak period, which was modeled as a function of the presence of a time-of-use rate, the peak to off-peak price ratio, inclusion of enabling activities in the program, the presence of critical peak pricing, and mandatory as opposed to voluntary rate. The key findings are shown in Table 2, with each intervention variable producing the reduction in peak consumption as shown.

Table 2. Percentage Reduction in Peak Consumption by Type of Intervention

	Time-of-use rate	Peak to off-peak price	Enabling technology	Critical peak price	Mandatory rate
Percentage reduction	-8.0%	-4.7%	-11.2%	-5.1%	-2.1%

Summary and Implications for Dynamic Pricing

Residential electricity demand response programs have been effective in reducing peak demand and increasing off-peak demand and consequently provide both customer and social benefits. Increased use of demand response programs can reduce expensive generation and distribution expenditures and provide increased value to customers. Additional benefits may be obtained through other innovations such as dynamic pricing, where retail prices more accurately reflect varying marginal costs of supply. In a recent working paper, Faruqui and Hledik note that "with the advent of the smart grid, dynamic pricing is receiving increasing interest by state commissions throughout North America as a means of enhancing economic efficiency by reducing the need for expensive peaking capacity." They argue that completing the transition to dynamic pricing would be facilitated by undertaking some or all of the following steps: (1) educate customers on the benefits of dynamic prices to create customer buy-in; (2) offer tools that allow customers to maximize their value from dynamic pricing; (3) design two-part rates to facilitate customer management of electricity consumption; (4) provide bill protection so that utility bills would be no higher than the otherwise applicable tariff during a phase-in period; (5) credit customers who move to dynamic pricing, with a portion of the supplier's hedging premium going for its provision of fixed rates; and (6) give customers choices in pricing plans so that they can match their price plan with the desired risk profile.

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AESP News

Updates and News from AESP

AESP Releases 2011 *State of the Industry Report*
By Dr. Katherine Johnson, Johnson Consulting Group

As AESP enters its 21st year, it seems fitting that our association take a look at one of the major parts of the energy services industry: the demand-side management (DSM) industry. DSM has matured considerably during the past two decades. This report provides a status on the important trends in DSM, including spending, savings estimates and impacts, and regulations. This report relied on data from a variety of secondary literature sources, including recently published reports and presentations focusing on the growing DSM industry in both the United States and Canada.

Key Findings

Some of the key conclusions from this year's report are as follows:

- Energy efficiency funding remains robust and continues to increase substantially both in the U.S. and Canada. Electric utility programs constitute the largest portion of energy efficiency budgets, increasing 80 percent since 2006, while Canadian budgets reached $670 million in 2010.
- Funding for natural gas programs has doubled in both the U.S. and Canada in the past few years. Natural gas programs are currently in place in 46 states and eight Canadian provinces. The total 2009 gas program budgets exceeded $1 billion for utilities in the U.S. and Canada. U.S. gas budgets have nearly quadrupled since 2006 to more than $900 million, while Canadian gas budgets have grown by 75 percent since 2007 to more than $90 million.
- These energy efficiency programs have led to substantial reductions in both energy usage and carbon emissions. These savings include reductions of more than 104,900 GWh of electricity and 367 million therms of gas. The avoided cost benefits of these programs were more than 61 million metric tons of CO_2, and ratepayer savings totaled more than $9.7 billion in electric and gas costs.
- Despite the robust growth in savings, the energy efficiency industry still faces a severe workforce shortage. One paradox of the growing energy efficiency industry is that while it is regarded as an important low-cost, environmentally benign resource, the industry itself is still not distinct or well defined. This will continue to be an ongoing challenge for the energy efficiency industry.

- Energy efficiency programs are targeting both all customer sectors. There has been an increase in interest among commercial building owners in green energy building programs. Another result of the increased emphasis on energy efficiency, corporate executives are also reporting an increased level of green building since 2006, according to a recent study published by McGraw-Hill (2010).
- Home builders are also increasingly interested in adopting green building codes, a trend which has been supported by a combination of utility incentives and new residential and commercial building code requirements.
- As the industry continues to grow and expand, there has been increased interest in best practices for program design, implementation, and evaluation. These best practices have been well documented by the natural gas utilities in both Canada and the U.S.

As this report clearly shows, the state of the industry is sound. The energy efficiency industry will continue to be a major contributor to reducing energy consumption and encouraging energy efficiency installations at the local, state, national, and international levels.

Click here to read the full report>>>

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New and Renewing Members

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Renewing Group Members
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DTE Energy
ICF International
Lennox Industries
Nexant
NYSEG/RG&E
OPOWER
Salt River Project
Westar Energy
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News Releases and Announcements

AESP Announces New Interactive Roundtable Sessions at its National Conference

ComEd recently completed case study of its Usage Data System. This study shows how one of our customers utilized benchmarking data for their building and subsequently took advantage of some of our incentive programs.

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