

EFFICIENCY

Energy Efficiency Savings, Budgets, and Spending

By Lisa Wood

As the utility plans for the long-term delivery of electricity to customers, resource selection is critical. Further, resource investments have long-lasting effects on company balance sheets, the environment, the economy, and the operation of the electric transmission and distribution systems that crisscross our nation. In the last 25 years, demand-side resources have been part of the resource portfolio. Indeed, they have altered the utility business and regulatory paradigms and delivered numerous benefits to customers.

And the size and significance of those resources continues to grow. Since 1997, the United States has witnessed a meteoric increase in dollars associated with electric efficiency—from \$2.7 billion to more than \$6.8 billion in 2011, according to the Institute for Electric Efficiency's (IEE's) 2012 annual report, "Summary of Ratepayer-Funded Electric Efficiency Impacts, Budgets, and Expenditures."

Demand-side resources are developed incrementally through the realization of marginal efficiency gains in the operation of buildings, homes, appliances, and equipment that make up our cities and towns and allow our economy to grow through productivity enhancements. From high-efficiency motors and light bulbs to better insulated buildings, demand-side resources have notably improved quality of life and

saved households and businesses more than \$11 billion in 2010. Programs for demand-side resources (that is, electric efficiency) either save energy as part of a larger energy efficiency (EE) program or shift energy use through demand response (DR) and load management (LM). Such programs are now some of the lowest-cost resources available—and the majority of electric utilities have incorporated them into their business operations.

While we can trace EE's origins to

the energy crisis of the mid-1970s, the current market and regulatory structures have transformed EE from being traditionally the resource of last resort to being, in many cases, the first resource. Recent developments in legislative and regulatory policies and mechanisms, such as state-level EE resource standards (which set annual savings targets), decoupling mechanisms, and performance incentives, have created a sustainable business environment for utilities pursuing demand-side resources.

Utilities strive to structure EE programs to be cost-effective, customer-focused, and equitably distributed. Typically, a utility will support a demand-side resource only if it meets specific cost-effective criteria. Designing a long-term resource portfolio where supply- and demand-side resources compete creates both sys-

tem and social benefits by offsetting the need to build little-used peaker plants to meet infrequently occurring system peaks, reducing greenhouse gas emissions, and saving customers money. A 2009 report by McKinsey & Company estimated that the upper-range value of potential energy savings associated with current and expanded electric efficiency programs is \$1.2 trillion by 2020.

In addition, with the support of sound policy and market mechanisms in place, the utility views EE and DR increasingly as a hedge against the volatility and uncertainty surrounding rising fuel prices, new-plant construction costs, siting and permitting of new transmission and generation facilities, and carbon and other environmental policies that increase the cost of electricity.

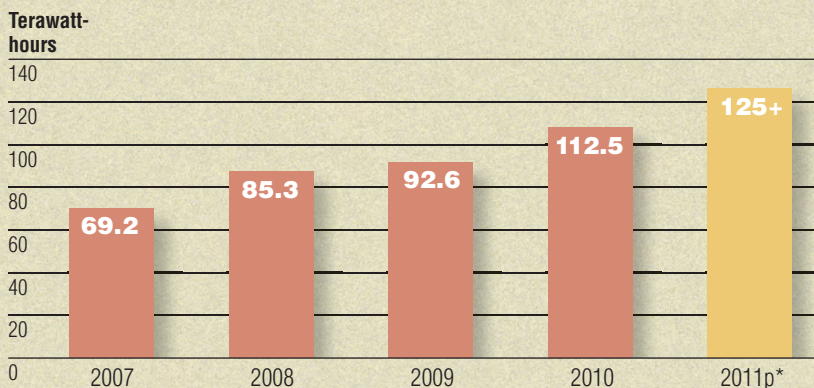
Utilities strive to structure EE programs, such as home energy audits, to be cost-effective and customer-focused.



Lisa Wood is the executive director of the Edison Foundation's Institute for Electric Efficiency.

Courtesy: The Energy Conservatory

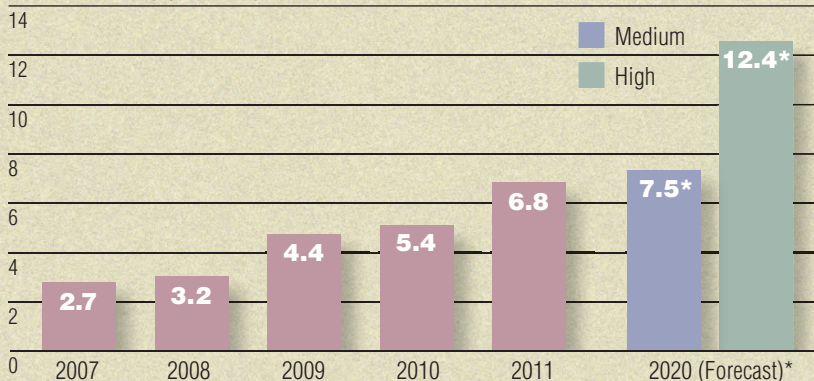
FIGURE 1
U.S. ELECTRIC EFFICIENCY SAVINGS
(2007-2011)



*projected (Lawrence Berkeley National Laboratory)
Source: Institute for Electric Efficiency. *Summary of Ratepayer-Funded Electric Efficiency Impacts, Budgets, and Expenditures*. January 2012.

FIGURE 2
ELECTRIC EFFICIENCY BUDGETS

Rate-payer funding for electric efficiency (\$ billions)



*Forecast from Lawrence Berkeley National Laboratory
Sources: Institute for Electric Efficiency; Lawrence Berkeley National Laboratory.

Permanent Savings and Growing

Overall, EE programs saved more than 112 terawatt-hours (TWH) in 2010 (enough to power 9.7 million homes for one year) and avoided the emission of 78 million metric tons of carbon dioxide. Utilities achieved electric efficiency savings at an average cost of 4.3 cents per kilowatt-hour (kWh) saved in 2010. Excluding DR program costs, which are aimed at shifting peak demand, the cost was 3.5 cents per kWh saved.

In 2010, U.S. aggregate electric efficiency savings increased by nearly

20 TWH, a 21-percent increase in savings from 2009 levels. All U.S. Census regions saw an increase in electric efficiency savings, with the largest percent increases in the Midwest (38.9 percent) and the Northeast (38.5 percent). The South stood at 19.8 percent, and the West, 5.3 percent. A few reasons for those increases include the growth in EE program spending between 2009 and 2010 and technological improvements in efficiency products.

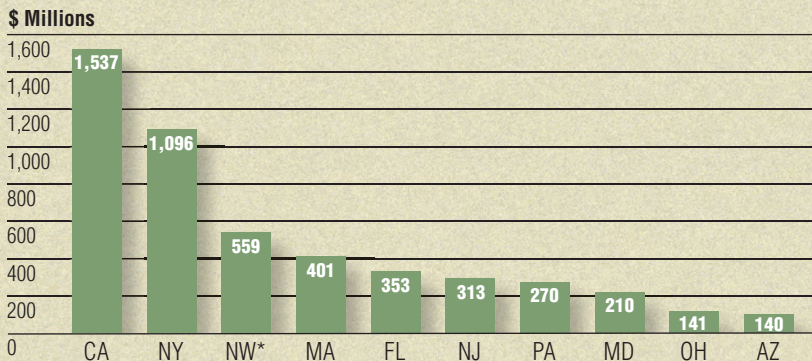
2011 is poised to be a stellar year for customer-funded EE and DR programs. The increase in 2011 electric efficiency budgets will continue to transform the ways in which electricity is used by customers across the United States. The Lawrence Berkeley National Laboratory (LBNL) projects 2011 total electric savings from customer-funded programs to meet or exceed 125 TWH. (See Figure 1.)

Truth Is in the Budget

The IEE report paints a vivid picture. It finds that the electric efficiency budgets for the nearly 200 organizations (mostly electric utility companies, the largest providers of electric efficiency in the United States) that administer EE and DR programs totaled more than \$6.8 billion in 2011—a 25-percent increase over the \$5.4 billion budget in 2010. (See Figure 2.) At the national level, electric efficiency budgets are split, with 82 percent of funds directed to EE programs (to reduce energy consumption) and 18 percent directed to DR and LM programs (to shift the timing of energy consumption). At the regional level, state policy objectives and regulatory structures influence the allocation of funding to all those programs—and program efforts and outcomes are tremendously important to grid stability and long-range resource planning.

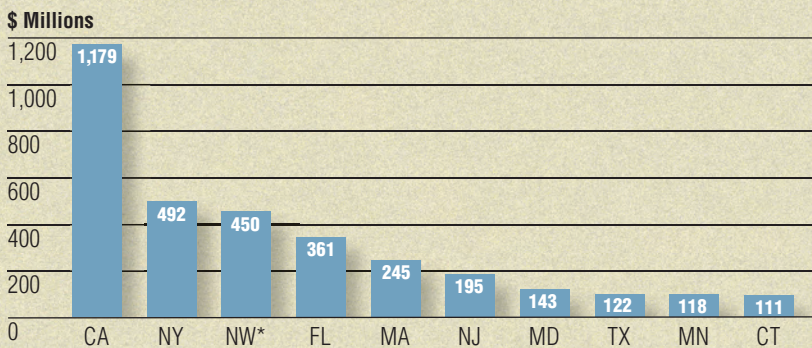
The growth in budgets from 2010 to 2011 continues the trend of double-digit increases in budgets observed over the past five years. From 2007 to 2011, the average annual growth rate for electric efficiency budgets was approximately 25 percent. That rapid growth rate is indicative of the recent dramatic increase in budgets for EE as a result of new state regulatory policies supporting customer-funded EE programs, as well as new state EE goals and targets.

FIGURE 3
ELECTRIC EFFICIENCY BUDGETS IN TOP 10 STATES
(2011)



*NW=Bonnetville Power Administration, Northwest Energy Efficiency Alliance, ID, MT, OR, WA
Source: Institute for Electric Efficiency

FIGURE 4
ELECTRIC EFFICIENCY EXPENDITURES IN TOP 10 STATES
(2010)



*NW=Bonnetville Power Administration, Northwest Energy Efficiency Alliance, ID, MT, OR, WA
Source: Institute for Electric Efficiency

Over the past five years, U.S. customer-funded electric efficiency budgets increased \$4.1 billion, from \$2.7 billion in 2007. A 2009 report by LBNL forecasts \$12.4 billion in customer-funded electric efficiency by 2020 under its "high case" scenario. (See Figure 2.) Given that half of all states, covering two-thirds of the population, have established EE resource standards and that several of these standards have scheduled increases, it is likely that LBNL is right and that budgets at least will exceed \$12 billion by 2020, according to IEE.

A majority of U.S. states—37, in fact—reported an increase in 2011 budgets relative to 2010 budgets; 11 states reported a reduction. The fact that over

70 percent of states increased their budgets indicates that state regulatory policies supporting utility EE investments are creating a sustainable business environment for many utilities to invest in this resource. Still, some states do not have the supportive policies that encourage increased EE investment.

Today, the distribution of budgets across the United States is uneven, with the top 10 states accounting for 74 percent of U.S. electric efficiency budgets in 2011. (See Figure 3.) But, as different states develop new programs—in some cases, for the first time in an effort to meet EE resource goals or targets—we can expect new EE leaders.

Expenditures Keeping Pace With Budgets

Similar to budgets, electric efficiency program expenditures grew tremendously in 2010. The reported 2010 expenditures of \$4.8 billion represent a 28-percent increase from 2009 levels. IEE attributes, at least partially, the large increase in expenditures to sharp up-ticks in energy savings goals associated with state EE resource standards.

Similar to budgets, the distribution of expenditures also was uneven, with the top 10 states accounting for 71 percent of U.S. electric efficiency expenditures in 2010. (See Figure 4.)

To provide some sense of relative magnitude, it is important to consider spending on electric efficiency in both absolute terms and in relation to the state's share of the nation's total population and electricity consumption. Six states have 2011 electric efficiency budget shares that are at least double their share of U.S. electricity consumption—California, Massachusetts, New Jersey, New York, Rhode Island, and Vermont. The funding of electric efficiency programs in these states has delivered substantial cumulative energy savings, thus lowering the per-capita consumption of electricity.

For example, the California electric efficiency budget represents 22.6 percent of total U.S. customer-funded electric efficiency budgets (\$1.5 billion of \$6.8 billion), but electricity consumption in California is only 6.9 percent of total U.S. consumption, while California's share of population is 12.1 percent.

The Future Looks Bright

A state's regulatory environment is a large factor in determining the size of customer-funded EE programs. Over the past several years, state regulatory frameworks have changed significantly in support of such programs, allowing some type of fixed cost recovery or performance incentives. States with regulatory frameworks that support utilities' pursuit of electric efficiency as a sustainable business tend to be the leaders in annual electric efficiency expenditures and budgets. ♦

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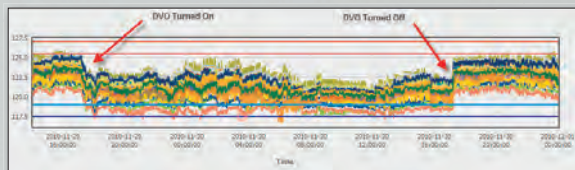
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