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State Policy Series: Impacting Industrial Energy Efficiency

State Energy Efficiency Resource Standards Analysis

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CONTENTS

EXECUTIVE SUMMARY

The effect of state energy policies in supporting energy efficiency in the residential, commercial, and industrial sectors is clear—states with strong energy efficiency policies save energy. Utilities' citing these policies as the primary impetus for offering energy efficiency and other demand-side management programs prove the impact strong policies have. One tool in the energy efficiency policy toolbox, the state-implemented Energy Efficiency Resource Standard (EERS) program, has been instrumental in encouraging energy efficiency across the nation. EERS policies are adopted by state legislatures and implemented and managed by utilities. They require that electric and natural gas utilities offer programs and incentives to encourage their customers to reduce energy use by a specified amount each year, based on a percentage of total energy sales.

EERS policy programs typically start with modest targets that increase over time. Typical savings goals can range from the relatively modest 0.25% savings annually to the more aggressive end of the scale such as 1.25% annually, with the most successful states setting even more ambitious targets. Terms of performance standard goals can vary—some are annual while others are cumulative, but an EERS is a long-term strategy to achieve energy savings and realize the financial and environmental benefits of those savings over time. EERS programs typically offer utilities the flexibility to utilize a market-based trading system to reach their set targets, and they provide support and incentives for utilities to successfully manage their own and their customers' energy use.

Utilities can work towards these goals by improving their own processes and distribution systems, implementing new efficiency standards in equipment and infrastructure, and encouraging their end-use customers to participate in energy-saving programs. In addition, they can purchase energy credits from over-performing utilities that have exceeded the set goals.[1]

EERS is a tested policy measure that has successfully reduced energy use in multiple states. Texas was the first state to adopt an EERS in 1999. As of April 2010, 24 states had some form of EERS in place, with three others strongly considering it. Having a state EERS policy in place ensures uniform energy efficiency goals across the state. It also provides a mechanism to create support programs that lead to reduced energy use. As increasing attention is focused on cutting energy consumption and the accompanying benefits of lower energy costs and less environmental pollution, it behooves states to have the ability to track performance against goals.

If all states were to adopt their own EERS, the United States could significantly lower energy costs, reduce air pollution, mitigate climate change, and improve energy reliability. These policies also lead to job creation as utilities implement new efficiency programs and monitoring systems. Despite these benefits and successes in individual states, no federal EERS mandate or Energy Efficiency Portfolio Standard (EEPS), as they are also known, currently exists.

For both the federal and state governments to meet their current and future energy efficiency goals they must focus on opportunities with the highest rate of return. The industrial sector accounts for more than one-third of energy use within the United States[2] and has the greatest potential for large returns on energy efficiency investment because each industrial plant represents a concentration of energy consumption.[3] As a consequence of this high rate of return within the industrial sector, focusing on industrial energy efficiency should be the first step in meeting energy efficiency policy goals. Perhaps more importantly, meeting these policy goals within the industrial sector lowers energy costs for manufacturers, keeping U.S. industries economically competitive in the global marketplace.

OVERVIEW

An Energy Efficiency Resource Standard (EERS) is a market-based means to promote more efficient generation, transmission, and use of electricity and natural gas. An EERS model can be created quickly and is often easier to legislate because it incorporates setting energy-savings goals rather than spending targets.[4] Although state policies differ in their savings targets, all EERS policies encourage end-user energy-saving improvements. Some states incorporate distribution system efficiency improvements, combined heat and power (CHP) systems, and other high-efficiency distributed-generation systems.[5]

The programs are typically monitored and documented by electric and natural gas utilities, but sometimes third-party program operators are assigned.[6] Penalties for non-compliance vary by state. They are assessed by the secretary of that state with minimum charges set that are higher than the market-based trade value to incentivize electric and natural gas distributors to make every effort to meet the required savings goals.

There are opportunities for energy efficiency throughout the economy for both individuals and businesses. A study released in 2009 by McKinsey & Company estimates that the United States could achieve a 23% reduction in annual energy consumption if proper energy efficiency measures are adopted. They break down the potential for end-use efficiency with the residential sector accounting for 35%, commercial representing 25%, and the industrial sector with the largest potential at 40%.[7]

Impacts on Industry

Industrial energy use is the highest of all sectors in the United States (around 30%) and globally (around 43%[8]). Taken together, the most energy-intensive industries account for approximately 45% of all industrial energy consumption. The sub-sectors, worldwide, that make up the list of most intensive energy consumers include iron and steel, chemicals, petroleum refining, pulp and paper, and cement production.[9]

Energy Efficiency improvements can occur in three primary ways in the industrial sector.[10] The following exhibit provides a description of each method and their respective investment levels:

Exhibit 1: *Primary Methods for Energy Efficiency Improvements in the Industrial Sector*

Method	Financial Investment
Energy management measures such as designating in-house energy managers, data collection, and review of operational efficiency.	Minimal
Replacing existing equipment with more energy efficient models through waste heat recovery, combustion control of furnaces, and improved heat exchanges.	Moderate
Manufacturing processes evaluation & modification including installation of advanced process controls, gas pressure recovery generators, or waste heat recovery generators.	Significant

State spending in industrial energy efficiency programs varies widely. Based on the states profiled in the Consortium for Energy Efficiency (see Appendix A), in 2007 Ohio allotted the largest percentage of its energy efficiency funds for the commercial and industrial (C&I) sector at approximately 82%. Rhode Island followed in second place with 69%. In contrast, that same year five of the states listed—including Illinois, Michigan, Maryland, Tennessee, and New Mexico—did not fund C&I efficiency programs at all.

The industrial energy savings driven by an EERS typically lead to additional benefits including lower carbon emissions, enhanced economic security and job creation, and the ability to acquire energy-efficient equipment.[11]

Despite the time involved in changing their processes, infrastructure, and training their staff, and the time lag between implementing change and realizing results, it is in the best interest of the industrial sector to make the necessary investments because they have the most to gain from increased energy efficiency.

CREATION AND IMPLEMENTATION

Developing a statewide EERS requires an act of legislation on the part of the state. In those states that have implemented programs, the charge for action can be led by a variety of different individuals and groups, including the State Utilities Commission, environmental groups, and utilities. Typically the process begins with environmental advocates who work with a local legislator to champion the cause. As a bill is drafted and introduced the issue often attracts the attention of other State offices, utilities and sometimes the Governor of the state in question. Together these groups collaborate to move the bill through the legislative process to get it passed.

EERS COMPONENTS

Setting Targets

The most common state EERS goal setting method in the United States requires distributors to achieve a set percentage of energy savings relative to average sales in the past (expressed in kilowatt hour [kWh]). Frequently, the goals are short-term and are often established for two-year periods, with the intent to increase the goals when that term expires. However, some states, including Texas and Illinois, express their targets in terms of load growth, while others like California and Vermont express goals in terms of absolute kWh savings.[12]

Load growth occurs through the natural expansion of a utility's service territory due to increased prosperity, productivity, or population.[13] For example, a state that expects electricity demand to grow by an average of 1.5% per year might set a savings target of 10.0% load growth, which equates to an average target of 0.15% of prior-year load.[14]

In order to reduce the burden on states and utilities, particularly in the immediate time after implementing an EERS, most legislation calls for modest initial savings targets for electricity and natural gas, increasing them over time as goals are met. The American Council for an Energy-Efficient Economy (ACEEE) recommends beginning at 0.25% of sales annually and moving towards the levels of 0.75–1.25% of sales annually.[15]

Exhibit 2: *Assessing Various Goal Setting Methods*

Measurement Mechanisms for EERS Goals	Pros	Cons
% of kWh Sales	Goals can be used for many years without needing to be reset since they automatically adjust to changes in energy sales.	Some uncertainty as to the exact goal.
% of Load Growth	Allows for aggressive goals.	Most uncertain, as growth rates can vary substantially from year to year.
Absolute kWh	Immediate transparency in terms of what savings is needed.	Targets will need to be adjusted periodically.

Source: American Council for an Energy-Efficient Economy, Energy Efficiency Resource Standards: Experience and Recommendations, March 2006, http://aceee.org/pubs/e063.pdf?CFID=4689843&CFTOKEN=83737750

Spotlight on Delaware

The State of Delaware passed EERS legislation in 2009 with Senate Bill 106, "The Energy Conservation and Efficiency Act of 2009." The bill came about through a partnership of the State Energy & Transit Committee, utilities, and the Delaware Department of Natural Resources and Environmental Control. The statute set goals to be achieved within a two-year period, expecting utilities to reduce electricity consumption by 2%, as well as a 2% peak-demand reduction by 2011. It also calls for that goal to rise to 15% savings by 2015. Natural gas utilities have to achieve a 1% savings by 2011 and a 10% savings by 2015.[19]

The statute also calls for funding and support mechanisms, including

- Partnership between state utilities and the Sustainable Energy Utility Oversight Board to create and manage energy efficiency and conservation programs
- Demand response (DR) programs, to be implemented and run by the utilities
- Funding initially supplied by the American Recovery and Reinvestment Act (ARRA) and the Regional Greenhouse Gas Initiative (RGGI), which will later transition to a Sustainable Energy Trust Fund.[20]

Achieving Energy Savings

Utilities are responsible for helping consumers reduce their energy use. They do this by providing technical resources and assistance, which helps their residential, commercial, and industrial customers identify and implement energy-savings opportunities. Utilities also provide rebates or low-interest loans to make implementing those measures more affordable. Standard programs include efficiency audits (often at no cost to the consumer), discounts on energy efficient equipment like heating and cooling machinery, water heaters and lighting, as well as home and commercial retrofits.

Other measures that utilities may promote include encouraging more stringent building codes, educating consumers on better energy use practices, improving efficiency within the utilities own distribution system, improving industrial processes, and providing incentives for suppliers to stock high-efficiency products.[16]

To engage their industrial customers many utilities design incentive programs where they offer financial assistance to companies based on projected energy savings from a project. The actual cost per kWh varies from utility to utility, but this seed money can be instrumental for industrial companies to make the changes needed to their processes and infrastructure. Very often these programs begin with a free energy assessment offered by the utility.[17]

Industry can reduce its use of energy in a variety of ways, including installing or upgrading to high-efficiency motors and transformers, implementing demand side management controls, and variable- and automatic-motor speed controls. Some industries can also realize significant benefits by modifying and improving their lighting system to utilize high-pressure sodium lamps, metal halide lamps, and automatic lighting controls.[18]

Funding

States have employed a variety of funding methods in support of EERS programs. Here is a snapshot of what some have done:

- **California** used a combination of utilities' resource procurement budgets (redirected from power plant investments) and a Public Goods Charge (a small charge per kWh added to energy bills)
- **Connecticut** utilizes a public benefit fund (PBF), similar to California's Public Goods Charge to finance energy efficiency programs and public interest research
- **Hawaii** takes advantage of significant funds from their lost revenue recovery provisions that have been built into utility commission regulations.

Administration, Measurement, & Verification

A state-level EERS will generally be administered by the state utility commission as they already have the authority, information, and resources available for such a task. The utilities are tasked with the day-to-day operations of the efficiency programs and reporting their progress to the commission.

Measurement must be done with care and include adjustments to account for factors such as weather or production levels. This will help ensure that the savings recorded were achieved through efficiency measures. One method for making the calculation for residential and commercial customers involves sampling the participants, determining the savings that can be attributed to a particular program using billing analysis, and then extrapolating that data to all participants. The result-

ing savings estimates can then be compared between participants and non-participants to provide a business-as-usual baseline.[21]

States should carefully outline the savings estimates in advance for specific energy efficiency measures. Utilities can use these estimates to develop programs and measure the energy savings they achieved. One example is if a utility offers an incentive to a local service provider that sells high-efficiency dishwashers that are known to achieve average annual savings of 100 kWh. If that utility gives out 1,000 rebates to its customers for those dishwashers in a year, the utility can assume 100,000 kWh of energy saved through its dishwasher efficiency program.[22]

Utilities report those savings estimates on a program-by-program basis to the state Public Utilities Commission who reviews the reports and uses them to outline savings targets in future iterations of the EERS policy. Some states, and the proposed federal legislation highlighted at the end of this report, also recommend having an independent third-party verification of the reports to ensure accurate reporting.[23] Regular reporting on the progress of EERS programs helps utilities, administrators, and legislators ensure that savings targets are met,

Exhibit 3: *Sample Electric Utility Savings Report*[24]

	2009	2010	2011	2012	2013
Electric Sales (millions kWh)					
Electricity Sales without Efficiency Programs	11,594,440	11,652,412	11,710,674	11,769,228	11,828,074
Sales Reduced by Prior Year's Savings	11,594,440	11,652,412	11,710,674	11,730,604	11,749,281
Baseline (average of prior 2 years' sales)	-	-	11,623,426	11,681,543	11,720,639
Program Savings (millions kWh)					
Existing Residential & Small Commercial	-	-	6,800	13,872	20,808
New Residential Construction	-	-	408	832	1,248
Commercial & Industrial	-	-	19,720	40,229	60,343
Efficient Products Programs	-	-	8,704	17,756	26,634
Low-Income Retrofits	-	-	2,992	6,104	9,156
Savings (millions kWh)					
Total New Energy Savings from Programs	-	-	38,624	78,793	118,189
Savings (as a % of baseline)	-	-	0.33%	67.00%	1.01%
Cumulative Energy Savings	-	-	38,624	117,417	235,606
Cumulative Energy Savings (as a % of baseline)	-	-	33.00%	1.01%	2.01%

* Savings are cumulative because measures installed in prior years continue to save energy for the full life of the measure.

Source: American Council for an Energy-Efficient Economy (ACEEE).

while providing an opportunity to also highlight best practices and acknowledge program accomplishments.

ACEEE has created a chart (see Exhibit 3) outlining one such report that a utility might provide to the public utility commission. This chart assumes program values based on programs and savings similar to those achieved in Texas and Vermont.

Penalties

Many states have included penalties when designing their EERS programs in order to guarantee efficiency results. Often these include a penalty fee that the utility must pay if it does not meet the specified target, as well as the understanding that they must make up the shortfall in subsequent years.

Although penalties can vary from state to state, a common model incorporates two levels of consequence. These charges are levied by the secretary of the state in question and may be adjusted for inflation.[25] Similar penalties are being considered in the pending federal legislation.

Alternative Compliance Payments occur when retail electricity or natural gas distributors pay the state to account for not meeting set savings targets. These payments are due by a specified date, often within one calendar year following the reporting period when the utility fell short. The minimum penalties in most states are as follows

- Electric utilities are charged $50 per megawatt-hour (MWh) of electricity savings needed to make up any deficit of the compliance obligation under the relevant performance goal
- Natural gas utilities are charged $5 per million British thermal units (Btu) of natural gas savings needed to make up any deficit of the compliance obligation under the relevant performance goal.

Civil penalties are the second tier consequence and occur when the secretary of the state charges the retail electricity or natural gas distributor for failing to document adequate savings. These penalties could be structured as follows

- Electric utilities assessed with charges of $100 per MWh of electricity savings or alternative compliance payment that the retail electricity distributor failed to achieve or make, respectively
- Natural gas utilities assessed with charges of $10 per million Btu of natural gas savings or alternative compliance payment that the retail natural gas distributor failed to achieve or make, respectively.

Utilities can offset those penalties in states that allow the market-based credit system, however, they are still held accountable for savings goals each year and the policies are typically laid out so that it is not to their benefit to buy credits year after year.

Many EERS policies also call for the utilities to shoulder the full burden of penalties restricting them from recovering any of the costs from utility customers through rate increases, surcharges, or other mechanisms. Furthermore, the penalty funds collected by the state are reinvested in additional energy efficiency programs.[26]

Regardless of the actual penalties a state sets for non-compliance, it is a best practice to keep those costs higher than the value in the market-based trading system to minimize the number of penalty situations.[27]

POTENTIAL BENEFITS

States that have implemented EERS policies have experienced significant benefits, and many have found that their utilities are able to easily surpass the initial, conservative savings targets. At three to four cents per saved kWh, energy efficiency improvements are often half the cost of increasing production of electricity through constructing new conventional plants.[32] In addition, unlike building more power plants, programs geared towards energy savings can be deployed in a fraction of the time it takes to construct and make operational a new power plant.[33] Obtaining permits and building a new coal-fired power plant can take up to five years, with significant environmental impacts. Construction of new nuclear facilities can linger for over a decade.

Based on the results of existing state EERS programs, there is strong indication that these programs yield significant benefits to the states and utilities, as well as residential, commercial, and industrial customers, including

- Reduced variable costs for utilities (i.e. lower wholesale power purchase and power production requirements)
- Job creation due to new energy efficiency roles
- Reduced or eliminated need to construct new conventional power plants that emit carbon dioxide
- Lower energy bills for residential, commercial, and industrial customers through reduced energy consumption
- Reduced environmental impacts through lower GHG emissions and reduced pollution.

Spotlight on Massachusetts

The state of Massachusetts successfully used the following process to implement an EERS:

- 2008: Governor Patrick and the state legislature adopted the Green Communities Act, which required all investor-owned utilities (IOUs) to achieve all available energy efficiency opportunities before purchasing additional power from nearby plants to accommodate growing demand.[28]
- 2009: The state convened an Energy Efficiency Advisory Council (EEAC) to study regional EERS programs and develop a meta-assessment for 2010–2012.
  - The EEAC was comprised of 11 voting members with representatives from business and industry, residents, state officials, environmental groups, the attorney general, the state's ratepayer advocate, and officials from utility-run efficiency programs.
  - The council met in public sessions, and the governor established a strong public review process.[29]
  - The team's research indicated that there was at least 2.5% savingws possible from electric utilities and 2.0% from natural gas.
- They rejected using a 'typical tech potential study' since actual savings tend to exceed anticipated savings for several reasons, including
  - They do not always include new technologies and tend to be conservative in their estimates
  - They focus on end-use type technologies, which does not account for savings at a facility level
  - The suggested goals don't always account for ramp-up time.

To outline the specific goals, Massachusetts considered not only the reasonable available savings but also factors like estimates of ramp-up from the new programs, the net costs and benefits, performance incentives, and the rate and bill impact on customers.[30]

Massachusetts' EERS is a three-year program that involves a $2.1 billion investment in support of energy efficiency. It was funded from multiple sources, including

- Ratepayer contributions
- Regional energy market revenues
- Proceeds from RGGI.

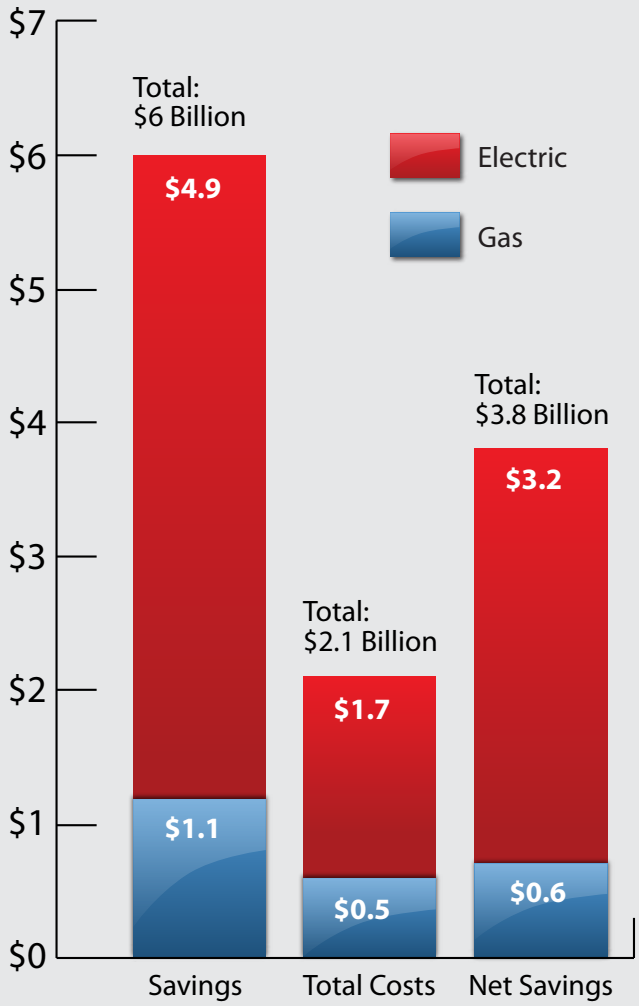
The anticipated benefits are enormous. The state expected to create more than 4,000 jobs and reduce greenhouse gas (GHG) emissions by nearly 15 million tons. They projected a reduction in peak-electricity demand by more than 400 MW, which equates to the size of a conventional power plant.

The plan puts in place a wide variety of support and outreach tools for residential, commercial, and industrial customers, including

- Integrated programs across utility service areas to simplify policies and procedures for customers with operations in multiple locations, such as grocery stores or restaurants
- Energy assessments made available to help identify ways to save energy in homes and businesses, as well as financial incentives and financing options
- Enhanced business programs with technologies like CHP.

The EEAC approved the plan on October 27, 2009, and following formal regulatory hearings and public feedback, the Department of Public Utilities gave their approval on January 28, 2010.[31]

Exhibit 4: *Total Estimated Financial Costs and Benefits under Massachusetts Electric and Gas Plans (2010-2012)*



Total Cost of $2.1 billion includes $580 million customer investments

Energy efficiency is a least cost resource. Increasing the amount of available energy by using it more efficiently is less expensive than increased production of energy. Studies show that large energy efficiency opportunities are available in all states, with estimates that some states could achieve 20–30% more energy efficiency.[34] Exhibit 5 displays ACEEE's calculations of the potential savings nationally if all states adopted an EERS with the goals of 15% savings in electricity and 10% in natural gas.

One example of a state that has benefited from implementing EERS measures is California. The state reported that as a result of their energy efficiency program they cancelled plans to build three 500 MW power plants, and expect to create as many as 18,000 energy efficiency related jobs between 2010–2012.[36]

Exhibit 5: *Projected National Energy Savings if all 50 States Utilized EERS.*[35]

Year	Electricity		Natural Gas	
	Annual Savings	Cumulative Savings	Annual Savings	Cumulative Savings
2011	0.33%	0.33%	0.25%	0.25%
2012	0.67%	1.00%	0.50%	0.75%
2013	1.00%	2.00%	0.75%	1.50%
2014	1.25%	3.25%	1.00%	2.50%
2015	1.25%	4.50%	1.00%	3.50%
2016	1.50%	6.00%	1.25%	4.75%
2017	1.50%	7.50%	1.25%	6.00%
2018	2.50%	10.00%	1.25%	7.25%
2019	2.50%	12.50%	1.25%	8.50%
2020	2.50%	15.00%	1.50%	10.00%

State Successes with Combined EERS and RPS Policies[37]

EERS complements renewable portfolio standards (RPS), and some states offer them in conjunction with one another. RPS policies require that utilities generate a percentage of their energy production through renewable sources such as solar, wind, biomass, or hydroelectric. In the past decade, more than a dozen states have created an EERS or allowed energy efficiency to meet part or all of an RPS.

- Texas, as of 2009, requires utilities to avoid 20% of the forecast increase in peak-electric demand through efficiency programs
- Illinois and Ohio require new electricity savings that will rise to 2% of sales each year
- Michigan requires 1% annual new savings from electricity and 0.75% annual new savings from natural gas
- North Carolina allows energy efficiency to meet up to 25% (rising to 40%) of its RPS
- Connecticut revised its RPS to add a separate tier requiring utilities to add savings through energy efficiency of 1% of electricity use each year through 2010
- The California Public Utilities Commission sets multi-year targets for electric and natural gas utilities based on a study of the potential cost-effective savings of the programs
- Vermont has performance requirements in its contract with an independent efficiency provider.

POTENTIAL CHALLENGES

While existing state-level programs have proven that an EERS program can be implemented at a relatively low cost and still yield positive results, there are challenges that must be considered. There are as many as 20 states that do not currently have energy efficiency regulations, and the money those states have allocated towards energy efficiency programs remains quite low (often less than one percent of revenues).[38]

Implementation Hurdles

Non-transparent Effects

Although states, utilities, and consumers from all sectors have realized savings through things like lower energy bills and eliminated need to construct new conventional power plants, the impacts of energy efficiency are not as tangible as many other state programs. As a result, stakeholders and investors may not see the benefits of saving energy as clearly as they do with other programs that compete for their approval and funding.[39]

Staffing

One concern for states and utilities without existing programs is the lack of skilled staff to create and institute energy efficiency measures. However, with the number and variety of programs already in operation, states beginning to consider EERS policies have a multitude of models that they can use to guide the setup of their own programs. Although there will be a ramp-up period, EERS policies should create additional jobs and growth opportunities for the local workforce.[40]

Risk Aversion

In implementing any new program, policy makers must address the psychological factors that affect investment decisions. One of the largest is overcoming a fear of the unknown and the perceived risk involved in newer technologies.[41]

Penalties

Utilities take on the greatest risk with EERS programs since they are responsible for designing and implementing efficiency programs to achieve the required savings, and are also subject to non-compliance penalties. To overcome this, most states have included cost-caps and other control mechanisms to ensure that the spending and expectations are reasonable; particularly for new EERS states that don't have an existing framework where accounting for a ramp-up period of several years helps ensure success for all.

Although penalties might cause concern to utilities, the market-based nature of the program helps alleviate some of that burden. Some states, and the proposed federal legislation, also favor an approach that allows over-performing utilities to accrue extra savings in the early years of an EERS program that can be applied in later years. Although this policy is helpful to utilities in a variety of ways, it is primarily used to address concerns about utilities that have efficiency programs in states that do not require them. Those institutions benefit from having an existing infrastructure, but also have to work harder to reduce energy consumption in relation to those utilities that still have all of the 'low hanging fruit' available to them.[42]

Industry Hurdles

As the peak energy users in the economy and the sector with the most efficiency potential, industrial customers may feel the greatest pressure from utilities striving to meet EERS goals. However, when implemented properly an EERS should provide efficiency mechanisms that minimize the burden that comes from the process changes necessary to reduce energy consumption.[43]

Transition Costs

Evaluating existing processes and equipment and instituting change naturally leads to some disruption of production and manufacturing. In some cases factory managers may object to losing productivity during the process of improving energy efficiency.[44]

Return on Investment Timelines

Many studies have shown that people are more willing to invest in programs that have a short period of time between the investment and the return. Identified energy efficiency measures must have a simple payback period that falls within a maximum timeframe. An industry rule of thumb for this payback period is two years. Industrial plant assessors must strive to find these short payback opportunities if action is to be expected by the industrial community.

Core Business Conflicts

Even when identified energy efficiency measures pass the two-year payback period, many industrial plants will not implement these measures because energy efficiency is not part of their core business. As a result, improvements in industrial processes and programs are not always prioritized. Executive decision makers within industrial businesses must be convinced that energy efficiency reduces operating costs.

STATE PROGRAMS

States looking to implement an EERS must carefully consider their unique circumstances and policy objectives, such as economic growth, environmental concerns, energy-supply resources, and impact on individual consumers and industry.

Current and Future Participation

By early 2010 the states that had implemented EERS policies were Arizona, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Iowa, Illinois, Indiana, Massachusetts, Maryland, Michigan, Minnesota, North Carolina, New Mexico, Nevada, New York, Ohio, Pennsylvania, Rhode Island, Texas, Virginia, Vermont, and Washington. See Appendix B for a listing of states that have already implemented an EERS, as well as those seriously considering it. The chart demonstrates the wide variety of measures that states are taking to improve their energy efficiency.

Currently, three states have pending legislation that would implement an EERS—New Jersey, Utah and Wisconsin.[45] Leaving regulation at the state level means that the magnitude and ultimately the results of such laws will vary widely. For example, New York requires ratepayer-funded electric energy efficiency programs to double their average annual savings to 1.4% between 2009 and 2015.[46] In contrast, Rhode Island regulators hope to set increasing annual savings targets that could reach nearly 20% by 2020.

Potential Energy and Economic Savings by Region

The regional potential for industrial energy intensity savings varies significantly across the United States. According to a 2009 U.S. Department of Energy report, the South had the highest prospective savings yet to be achieved, while the Northeast had the least.[47] This report is based on the regions as defined by the U.S. Census Bureau. The South, which has the lowest energy costs in the country and the most untapped potential for energy efficiency, also has the lowest state participation in EERS activities. Only four southern states—Delaware, Maryland, Virginia, and North Carolina—have implemented EERS policies. Exhibits 6 and 7 illustrate how the regional potential for energy savings compare between the states that had an EERS in place as of early 2010.

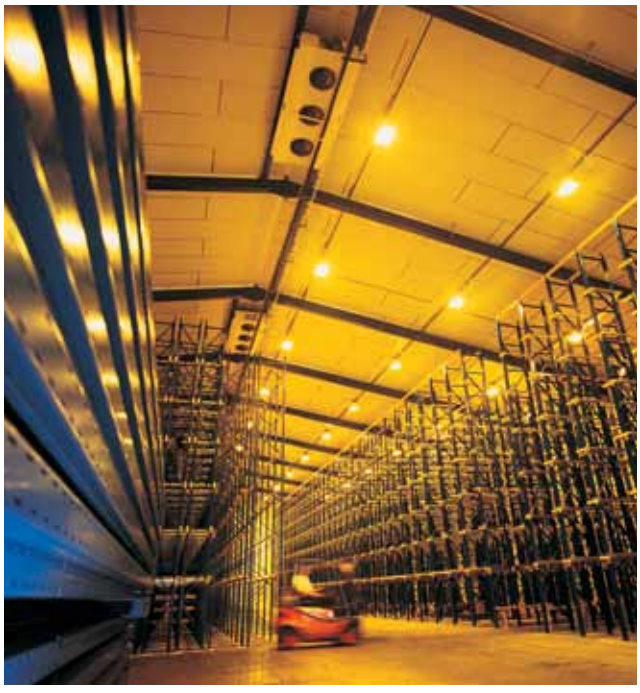
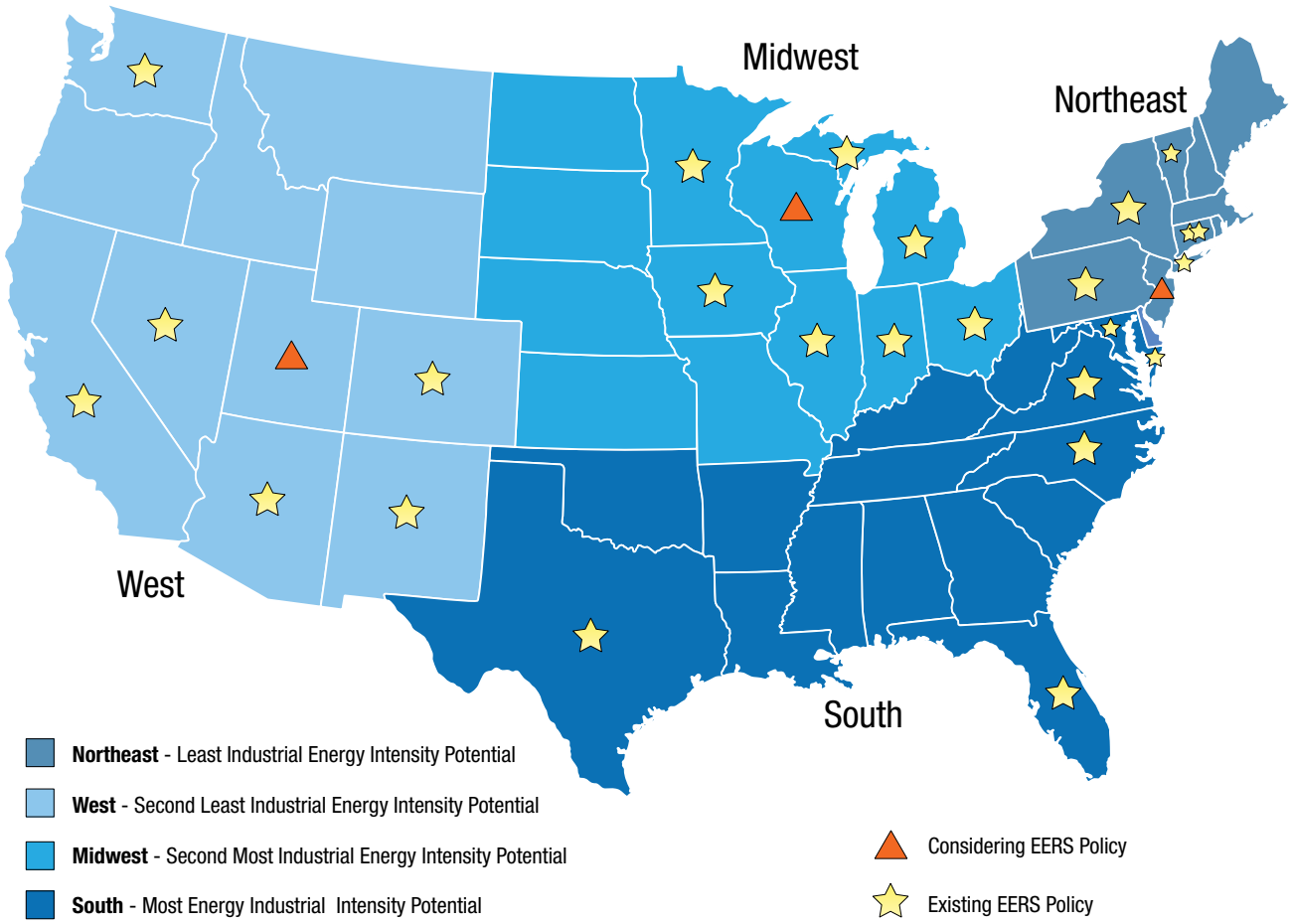


Exhibit 6: *Potential Industrial Energy and Economic Savings by Region*

Region	Potential Energy Savings (in trillion Btu)	Potential Economic Savings (in millions)
Northwest	58	$789
West	144	$1,830
Midwest	670	$7,300
South	1,673	$19,400

Exhibit 7: *Industrial Energy Savings Potential & EERS Activity by State*



Picking the Right Model for Your State:

The State of Vermont has instituted a unique energy efficiency program called "Efficiency Vermont." The program is coordinated by the Vermont Public Service Commission and is operated by a private nonprofit organization called the Vermont Energy Investment Corp. (VEIC). This statewide provider of energy efficiency services has achieved energy savings that are among the highest of any program in the United States, and is funded through ratepayer contributions collected through small charges on electric bills.

The Efficiency Vermont model benefits from excellent management and staffing, having access to a substantial budget, a good working relationship with regulators, and the fact that its programs are offered statewide. Oregon has a variation of this model which also works well; however, it may not be the most effective for all states.

For example, Delaware, a state with a limited budget has not been successful in modeling the Vermont program. Each state has different resources that should help guide the type of EERS policy they implement.

Pending EERS Federal Legislation

Two bills were being considered in the spring of 2010 that propose instituting a federal EERS. These are House of Representatives Bill 889 (HR 889), sponsored by Representative Edward Markey (D-MA), and Senate Bill 548 (SB 548), sponsored by Senator Charles Schumer (D-NY). Each named the Save American Energy Act, these bills call for programs to begin in 2011 and set national goals of 15% electricity savings and 10% natural gas savings by 2020.[49]

A 2009 report by the ACEEE estimates that the targets in the proposed federal EERS could achieve significant benefits, including[50]

- Creation of up to 222,000 net permanent jobs in construction, manufacturing, and other industrial sub-sectors
- A reduction of GHG emissions by 262 million metric tons by 2020—the equivalent of taking 48 million cars off the roads for that year
- Eliminating the construction of as many as 390 conventional power plants.

Although the legislation would set a national standard for energy savings, it calls for the states to manage the implementation and enforcement of those goals. The bills would authorize administration by each state's public service commission or another governing board, thus states that already administer an EERS would have an advantage in expertise for meeting this new role.[51]

Connecticut, Iowa, Massachusetts, and Rhode Island designed utility-run programs that have been extremely successful. In contrast, New York has a partially independent state agency that runs their efficiency program.

One of the main ingredients that each of these states utilizes to achieve their energy savings are program operators that manage the programs well and who believe in what they are doing. Other important components include employing effective in-state staff, having strong budgets in place for multiple years, not being impeded by too many bureaucratic rules, and having superior regulatory support. It is more important for a state to have these criteria than it is for them to follow a specific model.[48]

CONCLUSION

Energy efficiency is an increasingly important piece of America's energy policy. It has saved residential, commercial, and industrial consumers billions of dollars in the last two decades significantly reduced the environmental impacts of pollution and GHG emissions, decreased reliance on foreign energy imports, and furthered economic development through job creation.

States cannot rely entirely on federal stimulus dollars to fund energy efficiency programs. Although the ARRA stimulus funds promote energy efficiency programs, the money is allocated only through 2010. If states do not create their own, longer-term programs many of the ARRA funded efforts will be dismantled and jobs will be lost.

While there are a variety of ways to increase energy efficiency, the EERS model is especially effective because it incorporates a market-based system to keep costs down per unit of savings achieved. This makes the EERS easier to implement. Additionally, the EERS offers tremendous incentives not only to meet target savings goals, but to exceed them.

State regulators should consider the potential that implementing an EERS program could have on their area. The success achieved by states such as California, Texas, Vermont, and many others indicates that these programs can achieve considerable savings in terms of energy efficiency. Each state must consider their own unique circumstances to determine the best path and best implementation process should they apply their own EERS.

APPENDIX A

A Sampling of 2007 State Spending on all Energy Efficiency Measures by Sector[52]

	Residential Programs	Low Income Programs	Commercial & Industrial Programs	Other	Subtotal	Load Management	Total
			in millions of dollars				
Northeast							
Connecticut *	17.8	8.3	40.9	9.7	76.8	30.9	**107.7**
Massachusetts *	45.6	22.4	80.8	0.0	148.8	0.0	**148.8**
Maine *	2.4	3.3	8.2	3.3	17.3	0.0	**17.3**
New Hampshire	7.1	2.5	11.5	0.0	21.2	0.1	**21.3**
New Jersey	57.9	25.2	46.3	15.0	144.4	0.0	**144.4**
New York	49.6	46.1	127.9	31.2	254.8	15.7	**270.5**
Rhode Island *	4.5	2.0	15.0	0.4	21.8	0.0	**21.8**
Vermont *	7.3	2.4	13.7	1.9	25.3	0.0	**25.3**
Midwest							
Iowa	26.5	5.6	22.1	3.7	57.9	36.9	**94.8**
Illinois *	2.0	2.2	0.0	1.0	5.2	3.4	**8.6**
Indiana *	1.8	0.5	0.5	4.5	7.3	3.3	**10.6**
Kansas	1.2	0.1	0.7	0.0	2.0	2.3	**4.3**
Michigan	0.0	20.0	0.0	0.0	20.0	0.0	**20.0**
Minnesota *	16.9	7.2	40.6	4.1	68.7	20.9	**89.6**
Missouri	2.7	1.2	1.9	0.0	5.7	2.0	**7.7**
Ohio	1.0	0.0	5.1	0.0	6.2	0.0	**6.2**
Wisconsin	19.8	43.5	46.3	2.3	111.8	2.0	**113.8**

continued >

APPENDIX A - CONTINUED

A Sampling of 2007 State Spending on all Energy Efficiency Measures by Sector

	Residential Programs	Low Income Programs	Commercial & Industrial Programs	Other	Subtotal	Load Management	Total
			in millions of dollars				
South							
Florida	67.0	0.2	26.7	25.6	119.5	136.5	**256.0**
Georgia	5.6	1.4	2.8	0.0	9.8	19.9	**29.7**
Kentucky	0.5	0.8	0.3	0.0	1.6	0.8	**2.4**
Maryland	1.6	1.2	0.0	0.0	2.8	13.1	**15.9**
Texas *	24.6	23.2	22.9	5.5	76.3	6.7	**83.0**
Tennessee	7.0	0.0	0.0	4.5	11.5	2.2	**13.7**
West							
Arizona *	6.1	11.1	9.9	3.4	30.5	0.0	**30.5**
California *	232.4	183.7	488.3	101.3	1005.8	204.5	**1210.3**
Colorado *	1.9	2.6	7.8	5.3	17.6	7.2	**24.8**
Hawaii *	9.2	0.4	9.7	0.0	19.3	5.1	**24.4**
Idaho	3.0	1.8	9.9	2.2	16.9	5.9	**22.9**
Montana	1.9	1.3	3.9	4.8	12.0	0.0	**12.0**
Nevada *	16.8	2.9	8.3	1.3	29.2	7.9	**37.1**
New Mexico	0.7	0.8	0.0	0.5	2.0	0.0	**2.0**
Oregon	22.8	1.7	31.0	0.3	55.9	0.1	**56.0**
Utah	17.5	0.5	12.0	0.0	30.1	8.6	**38.7**
Washington *	29.3	6.5	43.7	7.7	87.2	0.0	**87.2**
Wyoming	0.5	0.0	0.7	0.0	1.2	0.0	**1.2**

Source: Consortium for Energy Efficiency, Estimated 2007 U.S. Energy-Efficiency Budgets Table, Accessed March 2010, http://www.cee1.org/ee-pe/2007/tables/Table1.pdf

* Designates states with an EERS policy as of 2007.

APPENDIX B

State EERS Policy Profiles

By April 2010, 24 states had adopted their own EERS policies. Three states had pending policies. The table below provides a brief summary of those policies and is organized in chronological order as to when each state first put a policy into place.

State	Existing EERS Policy	Reference
Texas 1999 and 2007	Texas became the first state to establish an EERS in 1999, requiring electric utilities to offset 10% of load growth through end-use energy efficiency. After several years of meeting this goal at low costs the legislature increased the standard in 2007 to 15% of load growth by 2009, and 20% of load growth by 2010.	Texas Statutes 39.905; PUCT Substantive Rule Sec. 25.181
Vermont 2000	Efficiency Vermont (EV)—an independent efficiency utility that delivers efficiency programs for the state —is contractually required to achieve energy and demand goals. EV cumulatively met over 7% of Vermont's electricity requirements by the end of 2007. EV has energy savings goals of 360,000 total annual MWh, 51.2 total summer peak MW, and 54 total winter peak MW. The projected MWh savings amount to 6% of 2008 sales for these three years combined.	30 V.S.A. Sec. 209(d)(e); VT PSB Docket 5980; Draft 2009-2011 Energy Efiiciency Utility Contract.
California 2004 and 2009	California's long-term targets for its IOUs plan to save over 16,000 gigawatt-hours (GWh) and over 4,500 MW between 2012 and 2020. The most recent 2010—2012 program plan sets interim targets of 1,500 MW and 7,000 GWh, which is equivalent to 2.6% of total retail electric sales in California. The plan also establishes natural-gas-savings targets of 150 million metric therms.	Rulemaking 06-04-010; Application 08-07-021
Hawaii 2004 and 2009	The state's new EEPS sets a goal of 4,300 GWh savings by 2030, approximately 40% of 2007 electricity sales. The public utility commission (PUC) must set interim goals and may change the 2030 goal if proven unattainable. It also calls for penalties for non-compliance. Formerly, under the state's RPS requirements, energy efficiency was allowed to qualify as an eligible resource. As of January 1, 2015, energy efficiency may no longer count towards the state's renewable goals.	HB 1464

State	Existing EERS Policy	Reference
Pennsylvania 2004 and 2008	Energy efficiency is an eligible resource in Tier II of Pennsylvania's Alternative Energy Portfolio standard, which was established in 2004 as a two-tiered renewable energy standard; however, there was no minimum efficiency target. In 2008, legislation was passed requiring electric distribution companies to meet 1% electricity savings in 2011 and a total of 3% by 2013, as a percent of 2009–2010 electricity sales.	Act 129; Alternative Energy Portfolio Standards (AEPS) Act (Act 213)
Connecticut 2005	In June 2005, the Connecticut legislature modified its RPS to include efficiency. Starting in 2007, the state's utilities must procure a minimum 1% of electricity sales from "Class III" resources such as energy efficiency and CHP, with an additional 1% required in 2008, 2009, and 2010. In 2007, the Connecticut legislature added a requirement for utilities to acquire "all cost-effective efficiency" and in 2008 the Department of Utility Control (DPUC) ordered utilities to establish savings goals. The DPUC is now reviewing a combined Conservation and Load Management plan with annual savings goals averaging about 1.5%.	The 2007 Electricity and Energy Efficiency Act (H.B. 7432); Conn. Gen. Stat. §16a-3a (2007). Docket 09-10-03
Nevada 2005	The state's RPS was expanded in 2009 from 20% to 25% of electricity sales. Energy efficiency can meet up to 25% of the total portfolio standard.	2009 Senate Bill 358
Rhode Island 2006	Rhode Island had a legislative requirement enacted in 2007 for electric and gas utilities to acquire all cost-effective energy efficiency that costs less than new energy supply as the first priority resource, placing it first in a utility's resource "loading order." Utilities are required to submit three-year and annual procurement plans with detailed energy efficiency targets. Plans have been approved by the state PUC but do not include any penalties for non-compliance. Since the targets are only for the upcoming year, not long-term, the policy remains pending.	2006 SB 2903
Ohio 2008	In 2008, legislation was enacted that requires a gradual ramp-up to a 22% reduction in electricity use by 2025. Starting in 2009, electric distribution utilities must achieve 0.3% savings, which amps up to 1% per year by 2014, then jumps to 2% per year in 2019 through 2025.	Ohio Revised Code 4928.66
Michigan 2008	Michigan's goals start at 0.3% of electricity sales in 2009 and a ramp-up to an annual electricity savings requirement of 1% of total sales by 2012, and continue at that level each year thereafter (0.75% for natural gas utilities).	SB 213

State	Existing EERS Policy	Reference
Iowa 2009	In 2008, the Iowa Utilities Board (IUB) issued an order asking IOUs to submit plans including a scenario to achieve a 1.5% annual electricity and natural gas savings goal. Most recently, in March 2009, the IUB approved MidAmerican Energy Company's Energy Efficiency Plan, which calls for 1.5% electricity savings by 2010 and 0.85% natural gas savings by 2013. Although not required by legislation, once the board approves the utility plan, the goals are binding. Also in 2008 the legislature passed a new framework for municipal and cooperative utility efficiency programs requiring these utilities to set energy-savings goals, create plans to achieve those goals, and report to the IUB on progress.	Docket No. 199 IAC 35.4(1) (EEP-02-38, EEP-03-1, EEP-03-4); 2009 Iowa Code Title XI, Subtitle 5, h. 476 C
Delaware 2009	Legislation enacted in 2009 sets goals for consumption and peak demand for electricity and natural gas utilities. The goals are 15% electricity consumption and peak-demand savings and 10% natural gas consumption savings by 2015.	SB 106
Indiana 2009	Indiana's Commission ordered all jurisdictional electric utilities to begin submitting three-year DSM plans in 2010 indicating their proposals and projected progress in meeting annual savings goals outlined by the Commission. The goals begin at 0.3% annual savings in 2010, increasing to 1.1% in 2014, and leveling at 2% in 2019.	Cause No. 42693
Arizona 2009	On December 18th, the ACC ordered that all investor-owned utilites and rural electric cooperatives achieve 2% annual savings beginning in 2014. By 2020, the state should reach 20% cumulative savings, relative to 2005 sales, along with 2% credit from peak demand reductions from demand response programs. Electric distribution cooperatives are required to meet 75% of the standard in any year.	Docket Nos. RE-00000C-09-0427, Decision No. 71436
Massachusetts 2009	Massachusetts has a legislative requirement enacted in 2008 for electric and gas utilities to acquire all cost-effective energy efficiency that costs less that new energy supply as the first priority resource. The Department of Public Utilities also recently approved an annual electricity savings target of 2.4% and natural gas target of 1.15% by 2012.	D.P.U. 09-116 through D.P.U. 09-128
Florida 2009	In December 2009, the Florida Public Utility Commission set goals for its electric utilities at 3.5% energy savings over 10 years. The goal is less than half of the goal recommended by the Commission staff's own expert.	Docket Nos. 080407-EG-080413-EG; Order No. PSC-09-0855-FOF-EG

State	Existing EERS Policy	Reference
Utah Pending	Utah's recently passed EERS bill urges the state's PUC to set energy-savings goals of at least 1% per year for regulated electric utilities and at least 0.5% per year for gas utilities. The bill does not penalize utilities that do not meet the savings goals, as long as they make good faith efforts. A docket is open that is reviewing a wide range of demand-side management (DSM) policies including (but not limited to) the issues addressed in the resolution.	Docket No. 09-035-T08, House Joint Resolution 9
New Jersey Pending	New Jersey's utility efficiency goals, which are still under development, contain two main elements—setting energy and demand goals for the administrator of the Clean Energy Program, at 547 GWh in 2008, or 0.67% of sales; and requiring each electricity supplier/provider to meet efficiency goals. As of June 2007, the board of public utilities has been authorized to adopt an electric and a gas energy efficiency portfolio standard, with goals as high as 20% savings by 2020 relative to predicted consumption in 2020. It has yet to implement any targets for utilities.	Executive Order 54; New Jersey Energy Master Plan
Wisconsin Pending	The Wisconsin Public Service Commission approved the use of energy efficiency goals as a percentage of future use and demand. It is currently considering levels of goals, measurable targets, funding and evaluation of programs	Docket 5-GF-191

Courtesy of the American Council for an Energy-Efficient Economy, State EERS Fact Sheet, April 2010, http://www.aceee.org/energy/national/State_EERS_Summary_Apr_2010.pdf

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