Energy Efficiency Resource Standards: The Next Great Leap Forward?

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ABSTRACT

Energy efficiency is a proven, cost-effective strategy for helping address a surging demand for electricity and natural gas, lowering energy costs, reducing environmental impacts, and achieving a range of economic development and other benefits. One of the most promising and fastest-growing policy approaches for advancing energy efficiency in the utilities sector is the energy efficiency resource standard (EERS). Patterned after the popular renewable portfolio standard (RPS) concept, an EERS is a simple market-oriented policy mechanism for requiring the achievement of measurable amounts of energy efficiency savings.

This paper describes the EERS concept and traces some of the factors behind its emergence as a leading new policy approach in the utility sector. It then summarizes the key elements of the EERS approaches that have been adopted (or are pending) in ten states around the nation. The remainder of the paper consists of discussion of several important strategic issues that must be addressed when developing an EERS policy, ranging from setting appropriate savings targets to providing for measurement and verification.

Background

To understand this most recent energy efficiency policy mechanism, it is helpful to have some background and context regarding the history of utility energy efficiency efforts. Utility-sector energy efficiency policies can be characterized as having evolved through at least four major phases, as briefly described below.

The 1970s Energy Crisis Era

The first utilities to offer programs to help customers reduce energy use began their efforts in the 1970s, after the initial 1973 oil embargo. These programs were primarily intended to help customers cope with soaring energy prices by providing them with programs to help lower their utility bills. These programs were found to be quite popular with customers, and spending on and savings of utility energy efficiency programs ramped up on into the 1980s.

The IRP Era

In the mid- to late 1980s, the concept of utility integrated resource planning (IRP) emerged, which introduced the concept of demand-side management (DSM) and particularly

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accelerated the use of energy efficiency as an electric system resource. Electric utility energy efficiency spending grew steadily throughout this period, peaking at over $1.8 billion in 1994.

The Restructuring/Public Benefits Era

Just as utility energy efficiency spending was accelerating, the electric industry "restructuring" movement was launched in 1994 and quickly spread across the nation. Unfortunately, for a variety of reasons, restructuring created economic pressures that tended to cause utilities to reduce or abandon energy efficiency programs. In addition, the move toward more limited regulation under restructuring tended to weaken or eliminate prior mechanisms that had helped facilitate energy efficiency, such as IRP. Nationwide, annual electric utility energy efficiency spending plunged by over 50% from 1994 to 1997 (York and Kushler 2005).

In recognition of these adverse effects of restructuring on energy efficiency, many states included in their restructuring policy the creation of a "public benefits" funding mechanism, to continue some level of energy efficiency programming. The rationale for these programs was not to provide electric system resources (the "market" was to be responsible for that), but rather, to ensure that the beneficial effects of energy efficiency for the public (including environmental benefits) would not be lost. Arguably, the strategy of "public benefits" energy efficiency "saved" the concept of utility-sector energy efficiency and was able to begin to reverse the downward trend in utility energy efficiency spending, beginning in the post-1998 time period.

The Resource Procurement Era

By the late 1990s, there were growing incidents of electric system reliability problems in several regions, culminating with the massive California/West Coast electricity crisis of 2001. These events tended to re-focus attention on the role of utility sector energy efficiency as a system resource, a notion that had fallen out of favor during the restructuring era. In addition, in the post-2001 recession, a number of state legislatures had responded to growing state budget deficits by "raiding" public benefits funds intended for energy efficiency services (Kushler, York, and Witte 2004). As a result, states that just a few years ago had moved energy efficiency out of the domain of utility regulation in order to "save" it from demise under the deregulatory restructuring mindset are now ironically scrambling to find ways to move energy efficiency out of the state government budgetary arena and back into the utility regulatory domain.

Out of this mosaic, the concept of an energy efficiency resource standard has emerged as a leading new policy mechanism states are using to advance energy efficiency. This approach has several advantages that help respond to the historical lessons described above, including in particular: (1) it is directly focused on utility system resource savings; and (2) it does not create any "pot" of government controlled or appropriated funds that can be "raided" by state legislatures or governors. The next section describes the EERS approach in more detail.

The EERS Concept

An EERS is a simple, market-oriented policy mechanism to require utilities to achieve measurable amounts of energy efficiency savings. An EERS can be applied to either electric or gas utilities (ideally both) and is conceptually similar to the better known renewable portfolio standard policy approach for requiring minimum levels of renewable energy resources. Like the

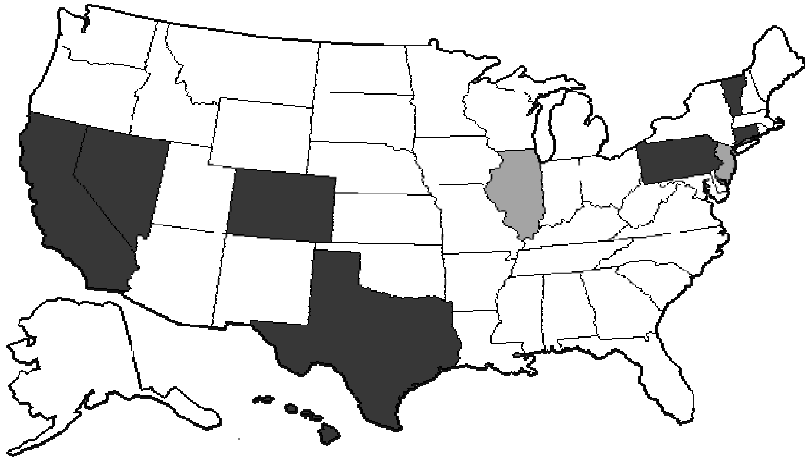
RPS concept, an EERS sets a minimum amount or percentage of total system supply that must be achieved (in this case through energy efficiency savings). Also like an RPS, an EERS can include market-oriented mechanisms, such as the flexibility to achieve the target through a market-based trading system.

The basic EERS concept involves end-user energy-saving improvements that are aided and documented by utilities or other program operators. Sometimes distribution system efficiency improvements and combined heat and power (CHP) systems and other high-efficiency distributed generation systems are included as well. EERS's are typically implemented at the state level but have also been implemented over smaller or wider areas—including entire nations (as discussed later with examples from Europe). With trading, a utility that saves more than its target can sell savings credits to utilities that fall short of their savings targets. Trading would also theoretically permit the market to find the lowest-cost savings, as with the emissions trading program pioneered in the U.S. EPA acid rain program. Trading also may provide avenues for involvement by third-party providers of energy efficiency savings. One additional aspect that makes an EERS attractive is that (unlike other resources such as coal, natural gas, and even renewable energy) energy-saving opportunities are bountifully distributed throughout the 50 states; studies in many states have found cost-effective opportunities to reduce energy use by 20% or more (Nadel, Shipley, and Elliott 2004).

Laws and policies based on an EERS approach are now in operation in a number of states (see Figure 1). The first prominent example was the Texas electricity restructuring law, which created a requirement for electric utilities to offset 10% of their demand growth through end-use energy efficiency. Utilities in Texas have had no difficultly meeting their targets and are currently exceeding them. Hawaii and Nevada recently expanded their renewable portfolio standards to include energy efficiency. Connecticut and California have both established energy savings targets for utility energy efficiency programs (Connecticut by law and California by regulation) while Vermont has specific savings goals in the performance contract with the nonprofit organization that runs statewide programs under a contract with the Public Service Board**.** Pennsylvania's new Advanced Energy Portfolio Standard includes end-use efficiency among other clean energy resources in a combined standard. Colorado's largest utility has energy savings goals as part of a settlement agreement, and Illinois and New Jersey are planning to begin EERS programs soon. EERS-like programs have been working well in the United Kingdom and parts of Belgium. Italy has recently started a program, and another is about to start in France. For more complete details and references on the states and countries with EERS in place (or being established or considered), see ACEEE's full report on this issue (Nadel 2006).

Some of these state and national policies are EERS's in a pure form—legally mandated targets with implementation rules including implications for non-compliance (in Texas and the European countries; also under consideration in New Jersey). Other state policies are variations on a pure EERS, including combined efficiency/renewable/"advanced" energy policies (in Hawaii, Nevada, and Pennsylvania), energy targets incorporated into contracts for statewide efficiency program providers (in Vermont and New Jersey), targets incorporated into utility commission decisions (in California and Colorado), and non-binding targets (in Illinois and to some extent Colorado). Table 1 presents summary information on state EERS. It well illustrates the diversity in approaches and structures in place to achieve target performance levels for energy efficiency. Some additional information on EERS programs can be found in the *Clean Energy-Environment Guide to Action*, a recent best practices document for state policymakers published by the U.S. Environmental Protection Agency (EPA 2006).

Figure 1. States That Have or Are Actively Considering Energy Efficiency Resource Standard Policies



Note: Black states currently have an EERS (CA, CO, CT, HI, NV, PA, TX, VT).
Light grey states have a pending EERS (IL, NJ).

Furthermore, in a number of cases it is clear that the EERS's are having significant impacts. For example, savings in Texas and the United Kingdom are significantly greater than savings before the EERS's began. In the case of Texas, energy efficiency savings in 2003 totaled more than 5 *billion* kWh, which is more than an order of magnitude greater than the 0.3 billion saved in 1998 before the EERS policy began. In the U.K., about 4 TWh were saved by programs in the year before the Energy Efficiency Commitment began. In the final year of the first commitment period, 39.5 TWh of savings were achieved, an order of magnitude increase. Regulators in Italy also report substantially increased activity and the utility in Nevada reports large increases in its energy efficiency budgets so it can achieve the maximum amount of savings permitted under its combined renewable and energy efficiency portfolio standard. Large utility energy efficiency budget increases have also been approved in California. For the other states discussed above, data are not yet available as their EERS's have all gone into effect after 2003, the last year for which complete state data are available. In all of these states and countries, the EERS is the primary change in policy that could have driven these increased savings and investments (Nadel 2006).

Implementing Energy Efficiency Resource Standards

There are several key policy decisions to be made in conjunction with establishing an EERS. In this section we discuss some of these key decisions and related elements necessary to implement EERS. By definition, an EERS is an "outcome-based" policy. The paths and processes to achieve the outcome may vary significantly from application to application, which illustrates the flexibility possible in implementing EERS's. Such flexibility is an attribute of this approach—enabling EERS's to be readily adapted to existing institutions and infrastructures.

Table 1. Summary of Current and Pending EERS Policies in the U.S.

State	EEPS Description	Applies to	Savings Target (TL=total load; LG=load growth)	Timeframe
California	Sets specific energy and demand savings goals.	Investor-owned utilities	Annual MWh, MW, and therm savings goals set for each program year from 2004 to 2013. For 2013: • 23,183 GWh, 4,885 MW peak • 444 MMtherms	2004–2013
Colorado	Settlement agreement approved by PUC includes specific targets utility will make "best efforts" to achieve.	Public Service of Colorado (the state's largest utility)	320 MW and 800 GWh (40 MW and 100 GWh each year)	2006-2013
Connecticut (Pending final Department of Public Utility Control decisions)	Includes energy efficiency at commercial and financial facilities as one eligible source under its Distributed Resources Portfolio Standard (also includes combined heat and power and load management programs). Goals are given as a percentage of load.	Investor-owned utilities	Savings goals set for the beginning of each program year:	
			1% (TL)	2007
			2% (TL)	2008
			3% (TL)	2009
			4% (TL)	2010 and thereafter
Hawaii	Allows efficiency to qualify as a resource under RPS requirements.	Investor-owned utilities	up to 20% of kWh sales (TL)* *overall RPS target, EE % not specified	2020
Illinois	Will set goals as percentage of forecast load growth.	Investor-owned utilities	10% (LG)	2006–2008
			15% (LG)	2009–2011
			20% (LG)	2012–2014
			25% (LG)	2015–2017
New Jersey (Program under development)	Two initiatives: 1. Setting energy and demand goals for overall PBF program. 2. Setting goals for savings as a percent of sales.	1. PBF program administrators (which is based on competitive solicitation) 2. Investor-owned utilities	1. 1,814 GWH (four-year total) 2. Conceptual draft calls for 1% per year for a total of 12% in 2016 (TL)	1. 2005–2008 2. 2005–2016 in conceptual draft
Nevada	Redefines portfolio standard to include energy efficiency as well as renewable energy. Targets are given as a percentage of sales.	Investor-owned utilities	Energy efficiency can meet up to 25% of the energy provider's portfolio standard:	
			6% -- EE up to 1.5% (TL)	2005–2006
			9% -- EE up to 2.25% (TL)	2007–2008
			12% -- EE up to 3% (TL)	2009–2010
			15% -- EE up to 3.75% (TL)	2011–2012
			18% -- EE up to 4.5 % (TL)	2013–2014
			20% -- EE up to 5% (TL)	2015 and thereafter
Pennsylvania	Includes energy efficiency as part of a two-tier alternative energy portfolio standard. There is no minimum for the energy efficiency portion of the resource mix. Targets are given as a percentage of sales.	Investor-owned utilities	up to 4.2% (TL)	Years 1–4
			up to 6.2% (TL)	Years 5–9
			up to 8.2% (TL)	Years 10–14
			up to 10.0% (TL)	Years 15 and thereafter
Texas	Sets goals as percentage of forecast load growth.	Investor-owned utilities	10% (LG)	2004 and thereafter
Vermont	Sets energy and demand goals for overall PBF program.	Program administrator	83,766 MWh 119,490 MWh 204,000 MWh	2000-2002 2003-2005 2006-2008

Sources: EPA (2006); Nadel (2006)

What Savings Target Is Appropriate?

There are two main categories of research that can provide important information to help answer that question. The first is the area of studies of "energy efficiency potential" that have been conducted, and the second is the information available about what levels of energy savings have been achieved in actual practice.

Efficiency potential. Many extensive studies of energy efficiency potential have been conducted in just the last half-decade or so, including at the national, regional, and state level. A few prominent examples include:

- The U.S. Department of Energy's national laboratories estimated that increasing energy efficiency throughout the economy could cut national energy use by about 20% in 2020, with net economic benefits for consumers and businesses (Interlaboratory Working Group 2000). A just-published report for the Western Governors' Association reached the same conclusion (WGA 2006).
- ACEEE, in a report on *Smart Energy Policies*, estimated that adopting a comprehensive set of policies for advancing energy efficiency could lower national energy use from Energy Information Administration projections by as much as 26% in 2020 (Nadel and Geller 2001).
- A national review of nearly a dozen state and regional energy efficiency potential studies (Nadel, Shipley, and Elliott 2004) found that the median level of estimated achievable potential was 1.2% per year for electricity and 0.5% for natural gas (with a smaller data set available on the gas side).

Demonstrated energy efficiency. Over two decades of experience with ratepayer-funded energy efficiency programs—whether provided by energy utilities or by non-utility organizations—have demonstrated that the energy savings possible through such programs are very "real" and are indeed reducing customer and system costs. Rigorous evaluation is an integral element of best practices for today's energy efficiency programs. Such evaluation has quantified the results and impacts achieved in order to determine program cost-effectiveness and other outcomes important to program administrators.

A recent review of experience with public benefits energy efficiency programs documents the range of savings they are achieving (Kushler, York and Witte 2004). Table 2 below provides data excerpted from that study, showing "incremental" annual savings achieved by programs (annual savings from measures implemented in the reporting year) as a percentage of total retail electricity sales.

Table 2. Energy Efficiency Program Spending and Savings

State	% of sales	Year
California	0.8	2003
Connecticut	0.8	2002
Massachusetts	0.7	2002
Maine	0.3	2003
New Jersey	0.2	2002
New York	0.3	2002
Oregon	0.4	2002
Rhode Island	0.8	2002
Texas	0.2	2002
Vermont	0.8	2002
Wisconsin	0.4	FY2003

The leading states in this set—California, Connecticut, Massachusetts, Rhode Island, and Vermont—all achieved savings from 0.7 to 0.8% of their total retail sales. More recently, many of these states (e.g. California, Connecticut, and Vermont) are targeting savings of more than 1% of sales annually (Nadel 2006). Furthermore, these results are only for programs that target end-use customer savings. If distribution system improvements or CHP are included, even more energy can generally be saved.

The results achieved by these states demonstrate clearly the magnitude of savings possible through these programs under "routine" conditions. As perhaps an example of "upper-bound" savings achievable under extraordinary circumstances, the experience during the "energy crisis" in California in 2001 is instructive. California was already one of the leading states in the nation in terms of energy efficiency accomplishments, having had substantial utility energy efficiency programs and other state policies for two decades. But in response to the electricity crisis of 2001, the state dramatically increased energy efficiency spending and public appeals, and California was able to reduce its total electricity consumption by 6.7% in one year (including proper adjustment for economic growth and weather), with savings costing an average of 3 cents per kWh (CEC 2001).

Based on this state experience, we conclude that EERS savings targets of 0.8% per year—even 1.0% per year—are feasible. Savings at this level are at the upper end of historical experience under routine conditions, but in this new era of higher energy prices, and with new policy innovations such as "trading" for energy efficiency credits, such savings would seem to be realistically achievable. For states without much energy efficiency program experience, initial year targets might be more modest, but could presumably increase up to these higher levels over a few years. A five-year target of perhaps 5% is within the realm of what leading states have achieved—and still is below what numerous studies have shown is the total cost-effective potential for energy efficiency. While the infrastructure and expertise might not be as well-developed in states just embarking on significant energy efficiency program efforts, it also is true that the energy efficiency potential in these states is likely greater as there are more "untapped" opportunities (applications that have never been upgraded to more energy-efficient technologies).

Should an EERS Be Separate from a RPS or Combined with a RPS?

Most of the states with EERS's also have RPS's as well. The two policies are often separate, as is the case in California, Illinois, New Jersey, Texas, and Vermont. However, in a number of cases, the two are combined. For example, Hawaii and Nevada have combined targets (with the efficiency portion growing out of an established renewables standard), although efficiency is capped at 25% of the target in Nevada. Connecticut and Pennsylvania have combined programs with separate targets for renewable resources and other resources.

Based on experience to date, all three of these approaches appear to be workable, so the choice of which route to take would depend on state-specific considerations and politics. However, if efficiency and renewable energy both count toward a combined goal, a floor for renewable energy can help ensure a balanced portfolio, since efficiency investments are generally less expensive per kWh and could dominate a combined portfolio. For this reason, renewable energy advocates generally prefer separate efficiency and renewable energy targets, although in some cases (e.g., Nevada) they supported combining the programs. Combining efficiency and renewable energy in some fashion tends to broaden stakeholder support for a policy, as combined proposals can draw support from renewable energy and energy efficiency interests, as well as supporters of other energy sources that are included. In particular, the inclusion of CHP and recycled energy may help gain the support of some industrial energy consumers.

At the national level, Congressional efforts to date have largely pursued separate RPS and EERS policies, although a couple of combined RPS/EERS proposals have also been advanced. The U.S. Senate has passed RPS's several times, but such legislation has yet to pass the House. A federal EERS was introduced in 2003 by Senator Jeffords (2003) but did not make much progress. As of this writing, several Senators were working to develop EERS bills.

Should Trading and/or Cost Caps Be Included?

Trading. To keep costs to moderate levels, states/utilities have generally focused on procuring the most cost-effective savings (but subject to provisions that all consumers have a chance to participate and low-income households are well-served). Trading is one way to allow the least expensive resources to be tapped—if a power provider can buy credits for less money than it would cost to operate their own programs, they will save money by buying credits. Also, allowing for trading gives power providers an additional mechanism to meet their obligations. Furthermore, trading allows successful program operators to sell surplus credits, providing a revenue stream to support some program costs.

Trading of credits was pioneered in clean air regulation and is widely perceived to be working well. Likewise, trading is commonly included in renewable portfolio standards through the use of Renewable Energy Credits or similar mechanisms, although it is too early to have much information about how these provisions have worked in practice.

In a related vein, allowing for independent efficiency providers to procure savings so that the market is not limited solely to established utilities, could enhance the opportunity for obtaining the lowest-cost savings. For example, Nevada makes explicit provisions for energy service companies and other independent efficiency providers. Likewise, the New Jersey conceptual draft includes extensive provisions for third parties and trading. In Europe, the U.K. and Italian programs include specific provisions to allow trading and third-party providers.

To implement trading, a system of tradable credits could be developed by program administrators, permitting credits to be awarded, bought, sold, and traded. For example, the New Jersey conceptual proposal includes a process by which credits can be issued by the Board of Public Utilities to energy suppliers and third parties for achieving documented savings, and then power providers must turn in the required number of credits each year. Such systems are now being implemented in Italy and are under study in many other European countries. In Europe, the credits are called *white certificates* in order to differentiate them from *green certificates* used in renewable energy programs, and that terminology, or close variations, appears to be catching on in the U.S. as well.

Under a white certificate program, a credit amount is determined (e.g., 1 million kWh of savings) and credits awarded by the program administrator once savings are verified. State utility commissions (or an equivalent body under a national system) would develop rules and guidelines for trading that could include bilateral contracts, or in the case of a regional or federal program, perhaps a trading market. Under the credit trading system, suppliers could buy and sell credits for efficiency savings. In addition, other entities could sell credits that they control, including end-users and efficiency aggregators, states, utilities, and private energy service companies.

Cost caps. In addition, to ensure that costs will be moderate, a cost cap could be provided. Such a cap could help assure policymakers that costs will be within acceptable levels. For example, the Connecticut program permits providers who are short of their targets to purchase savings credits for 5.5 cents per kWh of savings (or lower if permitted by the Connecticut utility commission). This fee effectively serves as a price cap on the cost of the EERS for individual electricity suppliers. Under the Connecticut law, funds collected from the fee are used to fund energy-saving programs. Pennsylvania has a similar provision with credits available for 4.5 cents per kWh of savings. The size of this "buyout" fee might vary from state to state, depending on local electricity prices and other conditions. Both the Connecticut and Pennsylvania fees are about half the average retail cost of electricity in the state (Nadel 2006).

What Steps Should Be Taken to Monitor and Verify Energy Savings?

Monitoring and verification (M&V) is an important part of an EERS program. It establishes a common currency for resource savings, helps ensure that savings targets are met, and provides information on program accomplishments. M&V provides the necessary credibility, transparency, and consistency needed to use energy efficiency as a resource to help meet economic, environmental, and energy system goals.

Detailed rules for M&V of savings are generally developed by state utility commissions based on established protocols developed elsewhere. For example, many states have developed such rules, including Texas, Pennsylvania, and Nevada. California also has prepared extensive guidance, such as a 2004 Evaluation Framework report and an entire Web site devoted to evaluation results (see www.calmac.org). If a federal program were to be developed, the implementing federal agency could develop the rules, but probably allow some flexibility for state public utility commissions to modify these rules for use in individual states.

In addition to rules on how to determine initial energy savings, evaluation rules also need to consider how savings will be credited over time. For example, some states have program operators evaluate savings for several years to allow for some attrition in savings over time. Based on savings trends over the first several years of measure life, an annual savings attribution

rate is applied to subsequent years. Another common and much less expensive approach is to use evaluation studies to determine average measure lives and allow program operators to assume that savings persist for this period.

Another key aspect of an EERS is the designation of consequences if targets are not met or rules not followed. As discussed above under trading and cost caps, many states have established penalties per kWh for shortfalls relative to targets.

How Does an EERS Relate to Other Energy Efficiency Policies Such as Public Benefit Funds and Decoupling?

Many states have adopted other policies to encourage efficiency investments, such as public benefit funds, decoupling, and state tax credits. These policies can and should be complementary to an EERS, and work best where policy makers and program implementers have taken care to think through the details.

Public benefit funds (PBF's) are small charges on electric (and sometimes natural gas) bills used to fund energy efficiency programs and other programs deemed in the public interest (e.g., assistance to low-income households). Seventeen states now have such funds (ACEEE 2004). PBF's can be used to fund all or part of the programs needed to comply with an EERS. For example, the Vermont Public Service Board is now considering an appropriate PBF funding level to meet its savings targets. In California, on the other hand, the PBF covers only about half of the utilities' efficiency program budget, with the other half being directly included in electric rates as part of utility resource acquisition.

While several states have both an EERS and a PBF, some states have only one or the other. An EERS without a PBF generally means that all program costs are included in rates. A PBF without savings goals generally means that more utility commission oversight is needed to help ensure that PBF funds are spent in ways that maximize benefits and deliver the necessary savings impacts. Often the choice of whether to do a PBF, EERS, or both depends on political considerations. In the 1990's, many states enacted PBF's because identifying appropriate spending levels was perceived to be easier to do than having to identify and verify specific levels of savings. In recent years, EERS's have become increasingly popular as these provide more assurance that specific levels of savings will be achieved, and also, given current state budget problems, it has become often easier to mandate savings than to mandate spending. However, situations vary from state to state.

In addition, for programs to succeed, they need to fit in with utility objectives, including, for investor-owned utilities, their obligation to shareholders. At a minimum, if utilities are to be involved in program delivery, achieving these objectives means recovering reasonable program costs. In addition, it may mean financial incentives to the utility for successfully meeting program objectives. Also, consideration should be given to aligning rate-making so utility profits do not suffer if sales decline due to successful energy efficiency programs (e.g., "decoupling" utility profits from sales), such as has been successfully accomplished in California.

Potential Energy Savings from a National EERS

Because EERS annual requirements are cumulative, savings would steadily mount. If an EERS calls for 0.75% savings per year after a two-year ramp-in period, by 2020 annual electricity and natural gas use in the covered region would be reduced by nearly 10%. At the

national level, ACEEE analysis indicates that EERS savings would amount to about one-quarter of the currently projected *growth* in electric sales over the 2007–2020 period and about one-half of projected growth in natural gas sales over this same period. A national EERS at this level would reduce U.S. energy use in 2020 by about 5.6 quadrillion Btu ("quads"), which represent about 4.6% of projected U.S. energy use for that year. Overall, an EERS at this level would provide net benefits to consumers and businesses of about $170 billion (i.e., discounted benefits minus discounted costs) (Nadel 2006). Estimated savings and costs are summarized in Table 3.

Table 3. Summary of Savings from a National EERS

	2010	2020	Cumulative
Savings from an EERS			
Annual elec. savings (TWh)	87	386	
Estimated peak demand savings (MW)	28,100	124,200	
Annual direct gas savings (TBtu)	355	1,570	
Total savings, all fuels (quads)	1.29	5.59	
Cumulative net benefits (billions)	-$13.7	$64.0	
Benefit/cost ratio			2.6
CO_2 emissions savings from an EERS (MMT)	76	320	

Note: 2010 and 2020 savings include savings from measures installed in prior years.

Conclusions

EERS's have emerged as a key state, regional, and national policy option to achieve greater levels of energy efficiency. An EERS is an outcome-based policy—setting targets to be achieved for energy savings for selected future years or periods. Achieving the targets can be accomplished via numerous models of program administration and implementation, including utility DSM and both utility-based and non-utility public benefits programs. It also is possible to create market structures that would allow trading among affected and/or eligible parties, which could include non-utility providers of energy efficiency services.

The EERS concept is a clear parallel to renewable energy portfolio standards. In some instances, separate EERS's and RPS's have been established. In a few cases, however, there are combined "clean energy portfolio standards" that include provisions for both energy efficiency and renewable energy. State experience shows that an EERS can be combined with other resource acquisition strategies (e.g., PBF's, RPS's) to ensure that cost-effective energy efficiency is pursued as part of the overall resource mix.

An EERS is a policy option with great promise to achieve significant levels of cost-effective energy savings. EERS's build on decades of experience with utility and non-utility energy efficiency programs, which provide ample evidence as to the ability of such programs to achieve significant levels of energy savings at costs significantly less than traditional investments in new generation. Experience in Texas, Vermont, and the United Kingdom indicate that EERS goals can be met or exceeded in a very cost-effective manner.

So far, states have led the effort to implement EERS policies, and we expect to see more states consider mechanisms of this type. There has also been interest in a national EERS in order to expand the savings and benefits throughout the country.

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