Deal or No Deal? Pros and Cons of Trading Under an Energy Efficiency Resource Standard

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ABSTRACT

Allowing trading of energy efficiency credits could have numerous benefits for a national energy efficiency resource standard (EERS) – most importantly, it could reduce the cost of compliance with the policy by increasing competition and facilitating the implementation of the lowest cost and highest value energy efficiency measures available. But it would create challenges as well, including possibly reducing the stringency of the EERS, increasing the need for a more expansive and sophisticated tracking system and providing perverse incentives to states to not adopt other energy efficiency policies such as building codes. Non-utility delivery of energy efficiency could intensify some of the advantages and disadvantages of trading. Anticipating and addressing the challenges outlined in this paper will be critical to tapping the full potential of a national EERS.

Introduction

Energy efficiency resource standards (EERS) impose energy savings targets on electric and/or gas utilities. Energy efficiency advocates have called repeatedly for a national EERS, but there is currently no such nation-wide program. In 2007, a proposed amendment to H.R. 6[2] by Senator Charles Schumer (D-NY) would have created a national EERS requiring retail electricity distributors to achieve cumulative end-use energy efficiency improvements equal to 10% of 2019 electricity sales and 5% of 2019 natural gas sales in 2020.[3]

If fully implemented, a national EERS on the order of the Schumer proposal could have a greater impact on US energy use than any other energy efficiency policy currently being considered (not including carbon pricing policies). According to the American Council for an Energy Efficient Economy (ACEEE), the Schumer Amendment would save over 300 TWh of electricity and eliminate more than 200 million metric tons of CO_2 in 2020, an amount equal to 16% of energy-related CO_2 emissions from the residential sector in 2005 (ACEEE 2007; EIA 2006).[4]

As more states impose EERS and the discussion on implementing a national EERS advances, careful consideration must be given to the design and implementation of the policy.

[1] We are grateful for support from the Pennsylvania Department of Environmental Protection, the Energy Foundation, and the US Department of Energy. We'd also like to thank Carl Blumstein and Daniel Schulte for their comments and insights, and to the participants of a meeting on energy-efficiency credits and renewable energy credits held in Philadelphia on February 14, 2008, whose opinions and comments contributed to the genesis of this report. The opinions expressed are solely those of the authors.

[2] Ultimately signed into law in December 2007 as Energy Independence and Security Act of 2007.

[3] The Schumer Amendment EERS would have raised the annual EERS requirement gradually.

[4] EERS savings estimates include savings from BAU policies which the EERS would ensure are continued. Savings estimates include electricity and natural gas targets.

One major question is whether a national EERS should allow trading among utilities and even non-utility entities – in other words, should a utility be allowed to purchase credits for energy savings achieved by another utility or non-utility implementer and apply them towards its savings requirement under the EERS?

There is little real experience with trading under an EERS since there are currently no working trading systems for energy efficiency credits (EECs) in the US. Only five of the 17 states that have or are developing EERS (or EERS-like programs) allow trading, and of those five states none actually has any trading occurring (ASE 2008). Of the five European countries with EERS, four allow trading, but trading is only actually occurring in the Italian market. The lack of trading under existing EERS is due to low EERS requirements, which create a surplus of efficiency savings and thus diminish the value of any efficiency credits; the complexity of measuring and tracking energy efficiency savings; and perhaps the newness of the policies.

Allowing trading of EECs could have numerous benefits for a national EERS – most importantly, it could reduce the cost of compliance with the policy by increasing competition and facilitating the implementation of the lowest cost and highest value energy efficiency measures available.

But allowing trading would create challenges as well. At a minimum, it would require the creation of financial instruments to certify and commoditize the energy savings that have been achieved by an entity – namely EECS. Trading could also reduce the stringency of a national EERS, increase the need for a more expansive and sophisticated tracking system and encourage states not to adopt, or even dismantle, other energy efficiency policies such as building codes. Non-utility delivery of energy savings could intensify some of the advantages and disadvantages of trading.

This paper outlines and provides preliminary discussion related to these various issues, specifically:

1) *Energy Savings* – How would trading affect the net energy savings from an EERS? What would the impact of trading be on states with different levels of BAU savings? How can potential adverse effects of trading on the stringency of EERS be mitigated? What are the possible reactions in terms of political acceptability of ratepayers in one area paying for savings in another area, without receiving the economic and environmental benefits in their own service territory?
2) *MV&V Requirements* – Does trading require greater levels of rigor with respect to monitoring, verification, and valuation (e.g., baseline calculations, additionality requirements, measure persistence, etc) of savings? For certifying and trading EECs?
3) *Tracking Requirements* – What is the effect of trading on tracking requirements of EECs and consequently on the government administration of an EERS?
4) *Value of EERS* – Would trading of EECs enhance or diminish the environmental and capacity benefits of a national EERS? Could trading help channel energy efficiency resources to states and regions where the efficiency improvements would provide the greatest value?
5) *Other Efficiency Policies* – With tradable credits, would states be inclined to make other energy efficiency policies such as building energy codes less stringent in order to sell the savings as credits and thus attract investment from other states? Could an EERS be designed to provide *incentives to the utilities* and states to keep and promote other effective energy efficiency policies?

6) *Non-Utility Delivery of Energy Efficiency* – How would the impacts of trading be different if non-utility delivery of energy efficiency is allowed?

Trading Makes a Weak EERS Weaker

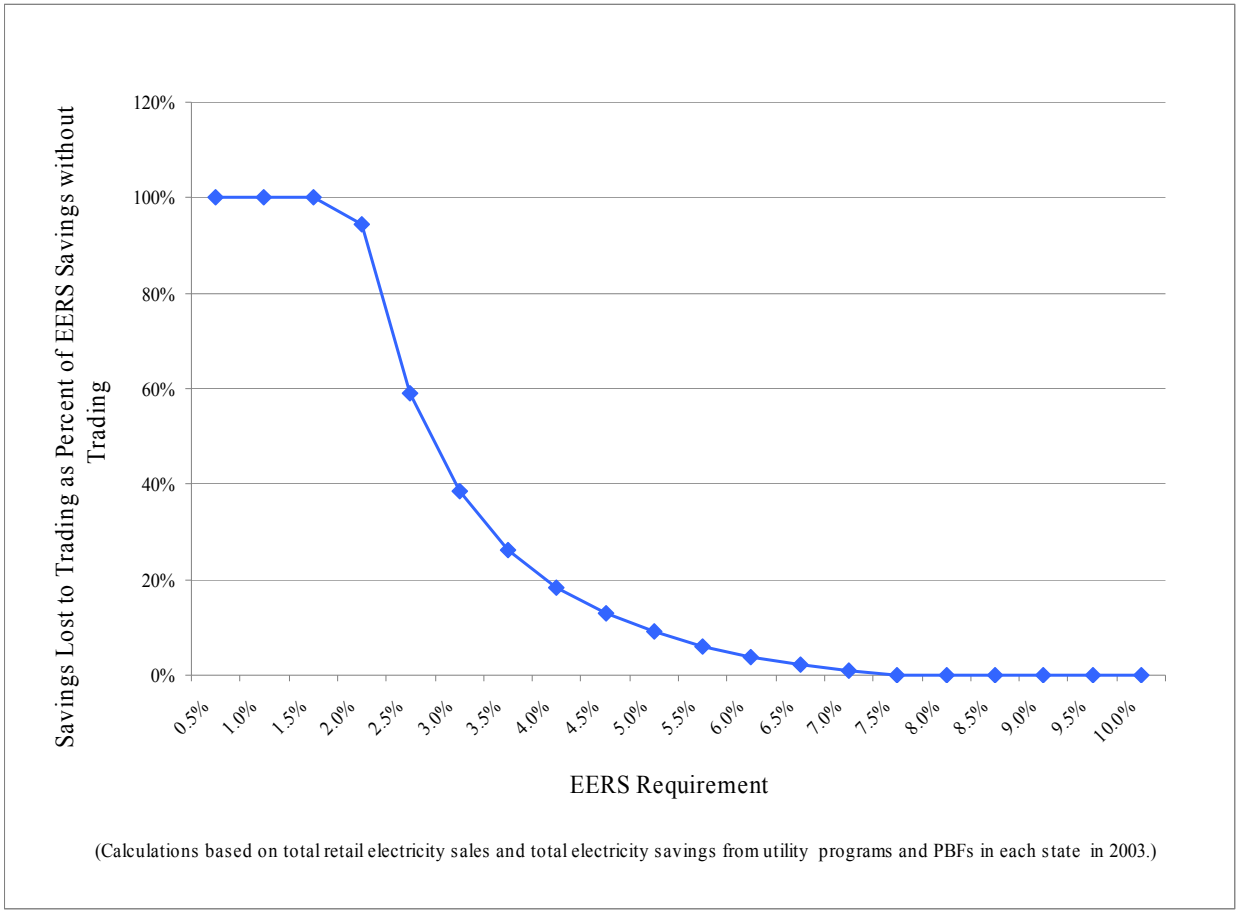
Allowing trading of credits under a national EERS could reduce the effective stringency of the EERS if the EERS requirement is below the business as usual (BAU) efficiency gains of the utilities with the highest savings.[5] In other words, if one or more utilities are already producing more BAU savings than the EERS would require, they would be able to sell their extra savings to another utility in lieu of that other utility achieving additional savings to meet its EERS requirement. In this case, trading among utilities would allow credit for more BAU programs, and thus reduce the effective stringency of the EERS. If the EERS requirement exceeds the BAU savings of every utility, then trading would not affect overall stringency. The key point here is that trading would make a weak national EERS even weaker. The savings from a strong national EERS would not be affected by trading.

The reduced stringency resulting from trading could be significant, especially at low EERS requirements (see Figure 1). Under a 4% national EERS without trading, BAU programs would account for roughly 40% of the required savings, leaving only 2.5 percentage points of additional savings. Trading would reduce the additional savings by another 20%, leaving an effective EERS of about 2%. As the EERS stringency increases, the reduction in savings resulting from trading decreases – with a 10% EERS requirement, for example, trading would not affect EERS savings at all since the BAU savings do not exceed 10% for any state (ACEEE 2007).[6]

[5] This discussion assumes that efficiency improvements that would be achieved anyway through pre-existing state EERS requirements, public benefit funds, or other policies are counted toward the national EERS requirement. It also uses state-level rather than utility-level data (because the available data appear to be better), in effect assuming that the percentage savings from utilities in each state are similar, and it assumes that non-ratepayer-funded efficiency cannot earn credits. And it assumes that BAU eligible savings will be the same as current savings. In another section we discuss why and how other business-as-usual policies, such as building codes or information programs might need to be credited as well.

[6] Calculations based on data on public benefit fund (PBF) and utility electricity efficiency program savings

Figure 1. Electricity Savings from EERS Lost to Trading

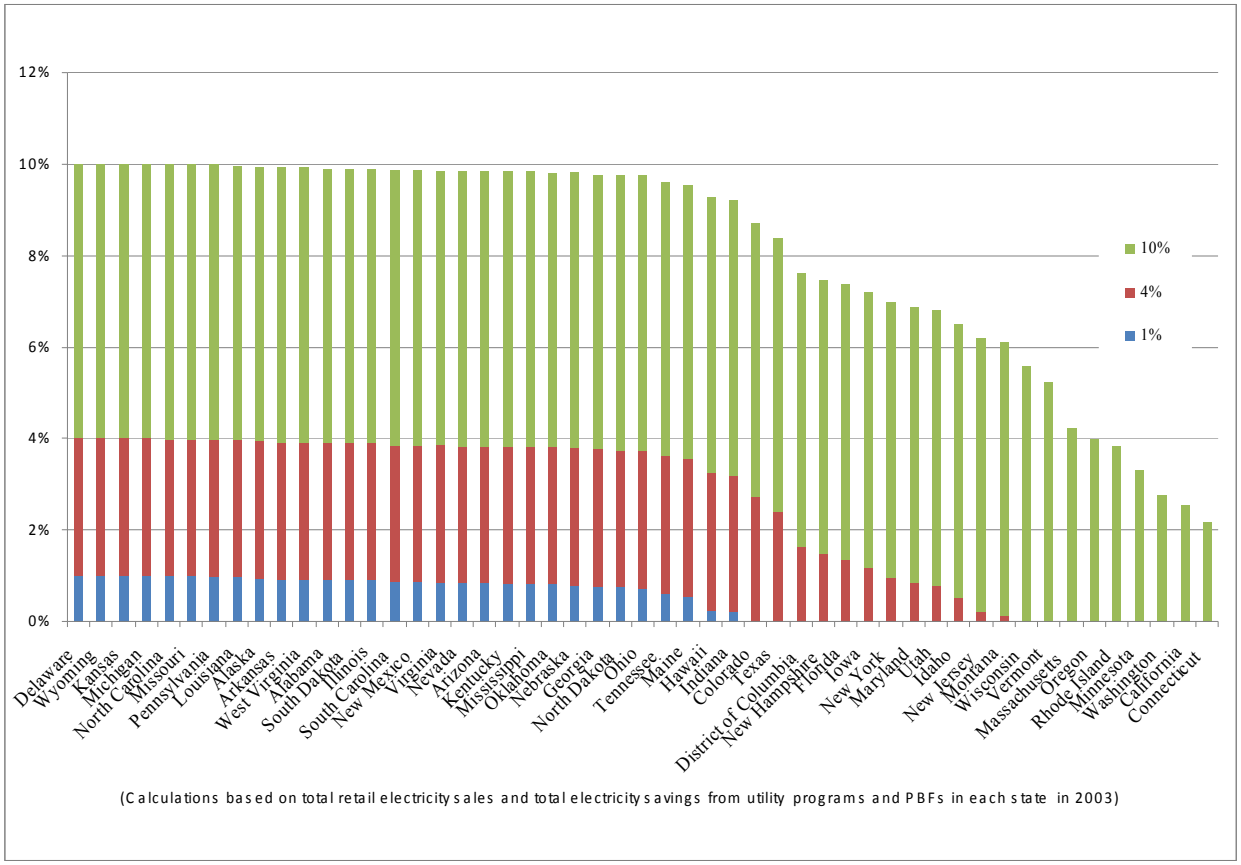


Source: ASE analysis based on data from York & Kushler (2005)

Figure 2 shows the relative additional savings that each state would need to achieve under various national EERS requirements (i.e, 1, 4 and 10 percent). 21 states would have surplus savings to sell under a 1% EERS requirement, 9 states under a 4% EERS and no states under a 10% EERS.

Of course, if the reduced stringency from trading is problematic, the EERS requirement could simply be increased. A significant increase in the EERS percentage requirement could perhaps make a national EERS politically less palatable, however. And the increased transfer of funds to pay for credits bought to meet the higher standard – in part for programs that other states are doing anyway – would certainly raise objections. In other words, it could be seen as a windfall for progressive states effectively paid for by a "tax" on laggard states. It is difficult to know whether the desire for lower cost compliance outweighs the equity concerns – i.e., whether trading increases or decreases the political viability of a national EERS.

Figure 2. Required Additional Percent Savings in 2003 by State under 1%, 4% and 10% EERS



Source: ASE analysis based on data from York & Kushler (2005)

Another option would be to allow utilities to use their own BAU programs to meet their requirements under the EERS, but not allow them to take credit for savings that are either required or funded under state law or rules. If enforceable, this could solve the problem of trading increasing the eligible BAU savings and reducing the effective EERS stringency. However, it could also encourage states to weaken their laws and regulations or to game the system by rewriting their laws and regulations in a way that will allow utilities in the state to take credit for the programs implemented under those laws (see below for a discussion of a similar issue regarding impacts of trading on BAU energy efficiency policies).

Trading Need Not Increase MV&V Requirements

Verification of energy efficiency savings may be the greatest challenge to successful enactment and implementation of a national EERS.[7] Monitoring and verification are activities undertaken to ensure that energy saving measures are actually implemented and that they

[7] Similar MV&V related challenges confront developers of many other energy efficiency policies and programs, including tax incentives, utility rebates, building codes, etc. A lot of people are working on these issues. Depending on one's general disposition, this fact can offer hope (a lot of people are thinking about these issues) or despair (many people have been thinking about these issues and they still aren't resolved).

perform as specified. Valuation includes development of baselines and ensuring that claimed savings occurred as a result of the EERS. A national EERS will require rigorous monitoring, verification and valuation (MV&V) of energy efficiency savings, whether trading is allowed or not.

Designing a trading system to maximize the integrity and reliability of savings generally imposes higher transactions costs on both administrators and participants; thus program offerings may be undersubscribed and unnecessarily costly. Adopting more lax MV&V requirements lowers transactions costs and increases participation, but may:

1) Reduce the effective stringency of the EERS by inflating savings estimates or counting savings from projects that were going to happen anyway; and
2) Flood the market, making the EECs less valuable and defeating their purpose of attracting investment.

Ideally all regulated entities would use similar MV&V protocols to ensure real savings and a level playing field. There is currently no shortage of protocols being used by states – for example, the eight New England states and New York treat spill over and free rider effects in five different ways, with some counting both, some counting none and some counting one or the other (Michals & Titus 2006). Some national EERS proposals would allow states to administer the EERS themselves using varying state MV&V rules. This could be problematic, whether or not trading is allowed. Under an EERS with trading, if states were allowed to adopt their own special brands of MV&V, it is not hard to imagine them relaxing their MV&V requirements in order to create credits at lower costs and attract investment which would otherwise go somewhere else. Without trading, states could still be inclined to impose loose MV&V requirements on in-state utilities, but would not have the additional inducement to loosen MV&V requirements so they could sell more EECs to other states.

In sum, federally established requirements and protocols for MV&V probably will be necessary for a successful national EERS. Allowing trading under a national EERS would probably not require any more MV&V rigor than the EERS itself will.

Trading Requires Better Tracking of Energy Savings

Trading under a national EERS would create challenges related to tracking of credits that would not exist without trading. The integrity of a trading system depends on avoiding double counting of savings. Avoiding double counting requires clear rights of ownership and the ability to track savings certificates so that they are not sold twice.

Fortunately, the basic tracking infrastructure mostly exists, though it will have to be modified for this purpose. Generation attribute systems are in place for most regions of the country. These systems track renewable energy credits (RECs) along with other attributes, such as the time and location the power was generated, related air emissions, etc. The only major holes in coverage for these systems are in New York, the Southeast and lower Midwest (Kerecman 2008).

The problem is that the existing tracking systems have been developed with different mandates. They are inconsistent and make little effort to coordinate, thus trading between these systems currently would not be seamless, if it could be done at all. In early 2008, the Center for Resource Solutions established the Environmental Tracking Network of North America to

facilitate communication and coordination among the various regional tracking systems, but full integration could be years away (CRS 2008).

Moreover, none of these systems appears to have significant (if any) experience tracking energy efficiency savings. However, once the MV&V requirements are instituted, creation and tracking of energy efficiency credits should be a relatively simple undertaking as energy efficiency credits should otherwise be similar to RECs.

Trading Can Direct EERS Savings to Most Valuable Projects

It is often unclear what the exact motive is for enacting an EERS. Existing EERS legislation and regulations at the state level cite multiple, and often conflicting, objectives, including: reducing peak demand and associated investment, economic development and jobs, improved local environmental quality, reduced energy costs, less reliance on imported energy, and reduced carbon emissions.

An EERS can be a rather blunt instrument for achieving these objectives since it would not distinguish between reductions in energy demand in one region versus another. It would require the same level of energy efficiency to be achieved regardless of the local conditions with respect to demand constraints, air quality or concerns about climate change. If the objective of an EERS is to reduce the need to build power plants or transmission lines, the location in which the energy efficiency improvement occurs will be critically important – efficiency improvements in California, for example, will not relieve capacity constraints in Connecticut. Likewise, efficiency improvements in Washington State will have far less impact on carbon emissions than reductions in the Southeast.

Other policies could more efficiently achieve each individual objective. A robust utility planning process could reduce the need to build more power plants or transmission lines.
Pricing environmental externalities such as greenhouse gas emissions either through a cap-and-trade or carbon tax would more equitably address environmental quality concerns. But often these "better" policies cannot be enacted or cannot be effectively implemented, leaving EERS as the best-available solution.

Allowing trading could make a national EERS less blunt by facilitating the transfer of resources from areas where efficiency improvements have lower value or/and higher cost to areas of greater value/lower cost. Utilities with capacity constraints would, at least theoretically, be willing to sell EECs for a lower price than a utility without any new capacity needs. Similarly, areas trying to meet local air quality standards could be willing to sell EECs for a lower price than they would in the absence of air quality problems.

Moreover, if states are allowed to restrict the areas from which in-state utilities are allowed to buy EECs, the EERS could help address local air problems arising from distant pollution sources. For example, New England states concerned about sulfur dioxide emissions from the Midwest could encourage (or require) in-state utilities to buy EECs from Indiana and Ohio to reduce demand for coal-generated electricity in those states. Similarly, if climate change mitigation is a driving concern, states could require in-state utilities to buy EECs from utilities with a carbon intensive generation mix.[8]

[8] Estimating the contribution of energy efficiency savings to reduce the need for new power plants or reduce carbon or local air emissions is not always easy. Among other things, the order in which generation units are dispatched and their operating efficiencies, as well as the overall system fuel mix, vary throughout the day, the year and over years.

Trading could potentially lower the costs and increase the benefits of a national EERS, but state economic development concerns could undermine that potential. Even if out of state EECs would best meet their needs, states could view interstate EEC purchases as a transfer of investment capital and jobs from their state.

Furthermore, many of the states and utilities with the highest capacity growth rates are precisely those where regulators and/or state policy makers have placed the least emphasis on energy efficiency as a resource – whether the ability to sell EECs to another state or utility would overcome this inertia is open to speculation. These laggard states and utilities might choose instead to simply purchase EECs from others and pass the costs (in the form of a "tax") through to their customers.

In sum, trading could theoretically make a national EERS a less blunt policy instrument by allowing the redirection of energy efficiency investments to areas of the country that need them most. The question is whether the theory would be matched by reality given the competition between states for economic development and the historical reluctance of some areas of the country to invest in cost effective energy efficiency improvements.

Trading Could Encourage a Race to the Bottom

Under most EERS proposals, utilities would be credited for energy savings realized through the programs they administer, such as DSM programs, distribution efficiency measures, and CHP system implementation. Utilities would not get credit for savings from other types of policies such as building codes, appliance standards, state consumer awareness and information campaigns, and tax incentives since savings from these policies would be considered BAU policies and would not be attributable to individual utilities.

To the extent that more of the low-cost energy saving opportunities are covered by BAU policies and programs, utilities operating in states that have stringent policies could have fewer and less cost-effective energy savings options than those which operate in states with less stringent policies.[9] In other words, stringent BAU policies could reduce the energy savings options available to in-state utilities and make it more difficult to fulfill their national EERS mandate.

A trading provision could further aggravate this problem as utilities in states with ambitious efficiency policies, and thus fewer remaining lower-cost energy-efficiency opportunities, could be driven to buy EECs from other states with less aggressive baseline policies, unduly benefiting the laggard states.

This dynamic could cause utilities to oppose state energy-efficiency policies. And state governments, wanting capital and jobs to enter the state rather than leave it, could be sympathetic. The literature on the extent to which states engage in this type of "race to the bottom" is not conclusive (Drezner 2006; Konisky 2007; Berry, Fording & Hanson 2003; Potoski 2001). Economic development and competitiveness are almost always serious considerations in state policy deliberations, but states consider other policy objectives as well.

If there is concern about a race to the bottom, utilities' EERS requirements could be adjusted to reflect BAU energy policies. Adjusting for a wide range of state policies – e.g., standards, tax incentives, tax subsidies, etc. – would be extremely challenging. Adjusting just

[9] Such policies would also decrease the baseline electricity sales of the utilities, thereby effectively reducing the stringency of the EERS mandate. However, the percentage reduction of low-cost efficiency opportunities will be much greater than the percentage reduction in baseline energy consumption.

for building energy codes would probably capture most of the savings from state energy efficiency policies.

Utilities could also be credited for their contributions to the development, adoption, and compliance with the policies. There is precedent for this in California where utilities that supported and helped the California Energy Commission implement state appliance standards and building codes can claim credit for the estimated savings from these programs. This provides additional incentive to utilities to support adoption of building energy codes and other efficiency policies.

Credit for Non-Utility Energy Efficiency Programs

Third parties such as state agencies, energy service companies, appliance manufacturers and retailers, industrial plants, building managers, and others could have an interest in developing their own energy efficiency initiatives, earning EECs for the savings, and selling the credits to utilities. Opening the system to non-utility EECs could reduce the cost of overall EERS compliance. Without trading, utilities have an effective monopoly on efficiency programs to meet the EERS requirement. If trading is allowed, utilities (subject to state regulation) could still choose to conduct their own programs, but by demonstrating that savings can be achieved at much lower cost, third parties could put strong pressure on utilities to reduce their own costs or to buy the savings from more cost-effective providers.

Allowing third parties to earn and sell credits could make MV&V more challenging. Ensuring effective MV&V of energy savings is hard under any circumstances, but will be harder if it's necessary to monitor thousands of disparate entities in different industries rather than hundreds of electric utilities. The implementing agency will need to make sure that credits represent real energy savings and that multiple parties do not get credit for the same savings.[10]

Allowing third parties to earn credits also could result in more credit being given for BAU savings, which would either reduce the effective stringency of the EERS, or (if the EERS requirement is raised) saddle ratepayers with paying for energy savings that would have occurred anyway.[11] If a significant fraction of the existing energy efficiency measures is counted toward the national EERS requirement, it could severely reduce the amount of additional savings that would be induced by the EERS.

Summary of Key Findings & Conclusions

Trading could have numerous benefits for an EERS – most importantly, it could reduce the cost of compliance with the policy by encouraging competition and facilitating the

[10] If instead the system is set up so that the utility buys a credit before it is validated, a regulated utility could require a greater level of MV&V for energy efficiency savings done by those non-utility entities to ensure the savings are not rejected by the EERS administrator. Alternatively, the utility could discount the value of the savings and pay the third party less to account for the utility's increased risk of credits being rejected. The utility could also transfer the risk to the seller of the credits by creating a contingent obligation in which the seller doesn't get paid if the savings claims are rejected by the administrator.

[11] To illustrate the scale of BAU savings, utility-sector efficiency programs in the United States claim to have saved 56 TWh of electricity and 158 million therms of gas in 2006 (1.5% of actual electricity use and 0.1% of direct natural gas use); all the U.S. programs spent a total of $2.6 billion in that year. (York & Kushler 2005). Total revenues of the energy service company industry were on the order of $4 billion last year, according to Don Gilligan, President of the National Association of Energy Service Companies (Gilligan 2008).

implementation of the lowest cost energy efficiency measures available. But trading could create challenges as well.

First, trading would make a weak EERS weaker, but would not affect the stringency of a strong EERS. Trading would only reduce the effective stringency of a national EERS if the EERS requirement is set below the BAU energy efficiency savings of the best utilities. If the EERS requirement exceeds the BAU savings of each regulated utility, then trading would not affect the overall stringency. The reduction in stringency could be avoided by not allowing the trading of credits from BAU activities, but enforcing this would be difficult.

Second, trading probably would not require additional MV&V rigor. Development of a national EERS would face significant challenges ensuring that energy savings are real and additional regardless of whether trading is allowed or not. There is little reason to believe that trading would add to this burden.

Third, an EERS with trading would require a more expansive and sophisticated system for tracking and trading EECs than an EERS without trading. To date, there is no national system for tracking energy efficiency savings. Regional systems for tracking RECs and other power generation attributes could be used for EECs, but they would need to be harmonized to ensure coordination and consistency among the different regional systems.

Fourth, trading could make a national EERS less blunt by facilitating the transfer of resources from areas where efficiency improvements have lower value or/and higher cost to areas of greater value/lower cost. Trading could, for example, spur additional energy-efficiency improvements in areas with capacity constraints or carbon-intensive generation.

Fifth, allowing trading under a national EERS could discourage states from adopting other energy efficiency policies such as building codes. Utility-related policies are counted toward EERS requirements, while other policies and programs are not. It might be feasible and necessary to adjust the EERS requirements for utilities in states with stringent BAU policies.

Finally, the non-utility delivery of energy efficiency project savings could lower costs and increase the diversity of projects used to comply with a national EERS. But, it could also effectively decrease the stringency of the EERS, or increase the cost, as more non-additional energy savings get counted as additional.

A national EERS offers great potential to reduce electricity and gas consumption, along with related carbon emissions and other impacts. Allowing trading of EECs could increase the benefits of an EERS and reduce the costs of compliance. Anticipating and addressing the challenges outlined in this paper will be critical to tapping the full potential of a national EERS.

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