

**REPLIES OF STEVEN NADEL TO QUESTIONS FOR THE RECORD  
APRIL 22, 2009 HEARING ON ENERGY EFFICIENCY RESOURCE STANDARDS**

**May 12, 2009**

**Questions From Senator Murkowski**

1. The push to enact a separate RES and EERS calls into question the goals of these standards – is to promote certain technologies, or to reduce greenhouse gas emissions?
  - a. If energy efficiency is incorporated into an RES, it would seem to me that utilities would have a much better chance of meeting their requirements instead of facing penalties for noncompliance. Wouldn't it be better to give them greater flexibility to succeed by adopting a single standard?

Response: On the one hand, energy-efficiency is widely available in all 50 states, and is also generally less expensive than renewable energy. Based on these considerations, yes utilities would have a better chance of meeting requirements if energy efficiency is included. But on the other hand, there are problems with combining the EERS and RES. First, the RES regulates “load serving entities” while the EERS regulates “distribution utilities”. While these are often the same, where independent power companies supply power, they are different. We think that distribution utilities can generally do a better job delivering energy efficiency services than independent power companies. Second, most proposals to combine the RES and EERS use energy efficiency as a small “safety valve” with efficiency capped at 4-5% of sales by 2020. Energy efficiency can and should do much more than that and should not be capped at such a low percentage. We are much more open to combining an EERS and RES if efficiency targets of 10-15% are added to appropriate RES targets. Third, most proposals to combine the RES and EERS deal only with electricity; we think that natural gas needs to be addressed as well through its own EERS. Finally, the purpose of an RES is to promote use of renewable energy. We leave it to renewable energy advocates to comment on this further, but we know that they are concerned that the renewable targets would be too low if an EERS and RES are combined.

- b. If Congress decides to enact an RES instead of an EERS, should we allow an unlimited amount of the renewables mandate to be met through energy efficiency measures?

Response: Allowing unlimited efficiency in an RES would be good for efficiency, but depending on the overall target, could undermine the goal of promoting use of renewable energy. We think a combined EERS-RES is generally better than no EERS, but such a combination needs meaningful targets so that both efficiency and renewables are promoted beyond business-as-usual levels.

2. This bill appears to provide only penalties, and no incentives, to facilitate compliance with the proposed federal standard. Please describe what other measures, if any, you think should be incorporated to encourage distributors to reach energy savings goals.

Response: ACEEE believes that incentives have an important complementary role to play. We hope that energy legislation will also include incentives, such as some of the programs included in S. 661 as well as incentives for comprehensive retrofits to homes and commercial buildings, along the lines of the program in H.R. 1778. We also support allocating a portion of cap and trade emissions allowances to local distribution companies for the explicit purpose of helping to fund energy efficiency programs. Provisions along these lines were included in the Boxer-Leiberman-Warner and Dingell-Boucher bills from the last Congress. Furthermore, S. 548 counts efficiency savings from codes and standards and we support several bills that would increase these savings such as S. 598 on appliance standards (sponsored by Senators Bingaman and Murkowski) and building code provisions and incentives that are now being developed by Committee staff.

3. I am concerned that requiring distribution utilities to develop and administer new energy efficiency programs, or obtain new technology will be expensive – especially for consumer-owned non-profits. The penalty payments called for by this legislation are very high, and there is also the likelihood of “layered” costs from an EERS, RES, and climate change legislation. How can we implement cost control mechanisms to keep costs for distributors – and therefore businesses and consumers – as low as possible?

Response: From our analyses, an EERS is an important cost control mechanism, helping to moderate energy cost increases and also reducing the cost of carbon emissions allowances, if cap and trade legislation is enacted. This is illustrated by the graphs on p. 16 of my written testimony. A similar finding is made in a just-released study by the National Renewable Energy Laboratory which found that the combination of an EERS and RES results in lower electricity prices than the basecase or an RES alone (see <http://www.nrel.gov/docs/fy09osti/45877.pdf>).

Furthermore, to ensure that costs are not too high, S. 548 includes alternative compliance payments of 5 cents per kWh or 50 cents per therm of natural gas. The intent of these payments is to encourage utilities to operate energy efficiency programs that cost less than the alternative compliance payment. Preliminary results from ACEEE research now underway indicates that the average electric efficiency program costs about 3 cents per lifetime kWh saved, while natural gas programs cost an average of 29 cents per therm saved. If the ACP is reduced to be less than the average cost of programs, then many utilities will choose to pay the ACP and not operate programs. In addition, under S. 548, money from the ACP generally goes to the states to operate energy efficiency programs, so these funds will remain in-state. However, since the average cost of programs is about 2 cents per kWh and 20 cents per therm higher than the ACP, there may be room

to lower the ACP a little, but we would recommend going no lower than 4 cents per kWh and 40 cents per therm.

One other point regarding ACP's is worth mentioning – the ACP for an RES and for an EERS should probably be different, with the EERS ACP *higher* than that for the RES. This is the case because with energy efficiency investments, when energy is saved, less power needs to be purchased, so even 5 cents per kWh energy efficiency saves money when power costs 6 or more cents per kWh. With renewable energy, the ACP is in addition to the underlying cost of power, so if conventional power costs 6 cents per kWh, utilities will be willing to pay up to 11 cents per kWh to avoid a 5 cents per kWh ACP (6+5=11). A 5 cents per kWh ACP for efficiency saves consumers money, unlike a similar ACP for renewable which costs money.

4. The proposed EERS legislation would calculate a utility's "business-as-usual" energy use by averaging its consumption levels in the 2 years prior to enactment. Utilities that are already making great efforts to reduce energy consumption – whether through a state-level EERS or their own initiative – may have a tougher time complying with the federal mandate due to their early action on energy efficiency. Should a federal EERS be designed to avoid disadvantaging those utilities, particularly compared to those who have taken no action?

Response: On the one hand, utilities that have active programs have already picked some "low hanging fruit" and will have to dig a little deeper to achieve the necessary savings. On the other hand, utilities with active programs already have the infrastructure in place and will not have to ramp-up as much, permitting them to achieve more savings in the early years than is required. We favor an approach whereby these utilities can "bank" *extra* savings achieved in early years and apply these to savings targets in later years. We think this is fair way to address this issue.

I should also note that our studies find that there is a cost-effective opportunity for about 30% electricity savings throughout the country, and so if some states have already achieved 10% savings, they still have about another 20% savings left, leaving a 15% savings target very feasible. Furthermore, the pool of available savings keeps increasing as new technologies are developed, such as LED lighting and improved heating/cooling controls.

5. Under Senator Schumer's bill, the federal EERS would require electricity savings of 15 percent, and natural gas savings of 10 percent, over the course of a decade. For the sake of comparison, can any of you provide the percentage savings that were achieved by these distributors over the course of the past ten years?

Response: Energy efficiency savings achieved by electric and natural gas distributors range enormously from essentially zero to fairly significant savings. For example, Efficiency Vermont, which operates statewide programs under

contract with the Vermont utility commission, has achieved approximately 9% electricity savings over the 2000-2008 period.<sup>1</sup> While I do not have the exact figures, my understanding is that savings in California and the Pacific Northwest have been even higher on a cumulative basis, but they have needed a longer period of time. For natural gas utilities, data ACEEE has compiled from utilities for a forthcoming report indicates that savings from Vermont Gas programs total 7.8% of 2006 sales. Vermont Gas began programs in 1999. Similarly, Iowa gas utilities have saved 8.2% of 2006 sales from programs operated over the 1996-2006 period.

6. You support an amendment to S. 548 to make clear that DOE should factor in growth in electric and natural gas vehicle sales when setting post-2020 targets. Does the bill, as drafted, make any allowance for an increase in economic activity? I'm concerned that while this bill claims to mandate "efficiency," it really focuses on reducing total "consumption," and these are two different things. Increases in energy consumption can result from an increase in economic activities, especially in manufacturing, even when new use is highly efficient.

Response: The bill requires that a specific level of energy savings be demonstrated relative to a rolling baseline. It does not use a fixed baseline, such as sales in 2008. By using a rolling baseline, in rapidly growing areas, sales can still grow with an EERS, they just grow a little more slowly. This is illustrated by the graph on p. 6 of my written testimony. Under the bill, there is no cap on consumption, just a requirement to demonstrate efficiency savings through program evaluations.

7. In March 2005, ACEEE submitted a statement to the record after this committee held a hearing on "Power Generation Resource Incentives and Diversity Standards." At that time, your organization endorsed a credit trading system to help utilities meet their requirements. In this Congress, however, that credit trading compliance option has been replaced by a different option – bilateral agreements – that appear much more limited. Please explain.

Response: We worked with many other organizations to develop this year's legislation. Some of these organizations were concerned about the time and resources needed to establish and oversee a national trading market. They were also concerned about opportunities for markets leading to some perverse results, as has happened recently in some financial markets (e.g. derivatives). Bilateral trades are simpler and can be overseen by state regulators. Also, our studies show that large efficiency opportunities are available in all regions, and therefore there is less need for trading with efficiency credits than with other types of credits now being discussed in Congress (e.g. emissions allowances and renewable energy credits).

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<sup>1</sup> Derived by ACEEE from:  
[http://www.encyvermont.com/stella/filelib/EVT\\_2008\\_Savings\\_Claim\\_Final.pdf](http://www.encyvermont.com/stella/filelib/EVT_2008_Savings_Claim_Final.pdf).

8. In that same statement, your organization also noted that an EERS could be combined with a Renewable Portfolio Standard. ACEEE also offered several suggestions for how a “Clean Energy Resource Standard” could be enacted – a standard that could have included energy efficiency, renewable energy, combined heat and power, and even clean coal and nuclear. Does your organization no longer support the enactment of such a standard?

Response: The proposed EERS does include combined heat and power. We are neutral on whether other clean resources are added to an EERS and RES provided that as additional resources are included, the targets need to increase so that they still promote substantial cost-effective efficiency investments. However, we note that adding additional resources increases support by some members but loses support from other members. We leave it to Congress to find the “sweet spot” where support is maximized.

9. Your organization released two reports on the federal EERS last month. The first projects consumer savings of \$168 billion over the standard’s lifespan. The second lists decoupling as one of the most important factors in achieving “future higher” energy efficiency goals. Does your \$168 billion estimate take into account the need for – and spending that could be associated with – decoupling?

Response: ACEEE believes that decoupling is a useful complement to an EERS. However, there are also other ways to improve the business case for utility investments in energy efficiency. The EERS bill deliberately leaves decisions on how best to handle these issues to state utility commissions. Therefore, we did not include any costs associated with decoupling in our savings estimates. That said, our savings projections use very conservative estimates of future electricity costs prepared by EIA. Most other forecasts predict higher electricity prices, which would increase the value of savings relative to our forecast. So even if decoupling were to modestly reduce savings, this would be compensated by the fact that electricity savings are likely to be more valuable than EIA predicts.

10. This bill appears to provide only penalties, and no incentives, to facilitate compliance with the proposed federal standard. Please describe what other measures, if any, you think should be incorporated to encourage distributors to reach their energy savings goals.

Response: This is the same question as question # 2.

11. I’m intrigued by “Efficiency Vermont,” which is the non-profit, statewide provider of energy efficiency services in Vermont. This is a very different structure than what S. 548 calls for, but I understand it’s has been very successful so far – the savings being achieved in Vermont are now among the highest levels of any state. Can any of you discuss “Efficiency Vermont” in greater detail, and what the pros and cons of a similar approach at the federal level would be?

Response: Efficiency Vermont is a statewide program coordinated by the Vermont Public Service Commission, and operated by a private non-profit organization – the Vermont Energy Investment Corp. (VEIC). VEIC was selected through a competitive request for proposals. The Efficiency Vermont budget is funded through a charge on electric bills by participating utilities. Efficiency Vermont began operations in 2000 and has developed a broad range of efficiency programs to serve many different sub-markets, which is illustrated in the graphic on p. 11 of my written testimony. Their programs have been well received, and in recent years, the Commission has increased their budget. This in turn has allowed them to dramatically increase their annual savings, as shown in the graph on p. 12 of my written testimony. Additional information can be found in their annual report, available at:

[http://www.encyvermont.com/stella/filelib/AR07Revised\\_Exec%20Summ\\_MW.pdf](http://www.encyvermont.com/stella/filelib/AR07Revised_Exec%20Summ_MW.pdf)

The Efficiency Vermont model works very well due to their excellent staff, good planning and management, substantial budget, statewide operation, and a good working relationship with regulators. While this model has worked very well in Vermont, and a variation on this model is working in Oregon, it may not work everywhere. For example, Delaware has been trying to replicate the Vermont model but has been having difficulty due to a limited budget and the lack of a good in-state organization to run the programs. From our review of the different states, other models for operating programs can also work. For example, Connecticut, Iowa, Massachusetts and Rhode Island have achieved very good results with utility-run programs. And in New York a state “authority” (a quasi-independent state agency) does a good job running programs. In all these cases, the successful program operators are well managed, believe in what they are doing, have good in-state staff, have had strong budgets for multiple years, are not impeded by too many bureaucratic rules, and have good regulatory support. These criteria can be met under a variety of models and we don’t believe any single model is “the answer” in all states. Based on these findings, we believe the decision on whether to follow the Vermont model, or whether to use another model, should be made at the state level and not the federal level.

### **Questions From Senator Shaheen**

1. As today’s witnesses have noted, energy efficiency measures are incredibly important to address our nation’s energy challenges. I think it is important to craft federal policies that incentivize investments in energy efficiency.

One of the concerns that I am aware of with an EERS, however, is that of market manipulation. Under an energy efficiency credit trading program, we may be giving credit for actions that would have already been taken regardless of an EERS mandate.

Many NE states are implementing policies to require utilities to procure all cost-effective energy efficiency. These least cost procurement policies, for example, require that a distribution company obtain all cost effective energy efficiency up to the electric supply

cost. The goals seem the same as an EERS, with an emphasis on cost-effective measures, and seem to avoid some of the issues of market manipulation.

Would you care to comment on least cost procurement policies and how they compare to an EERS?

Response: Least-cost procurement policies can work well where the utilities do a good job considering energy efficiency as a resource and where regulators have the skills and interest to oversee these analyses. These factors generally apply in New England, where many states are using least-cost procurement. But in some other regions, utilities are not very interested in considering energy efficiency on a par with other resources, and utility commissions may lack the staff, skills or interest to hold these utilities accountable. In my home state of Maryland, in the 1990s the utilities claimed that there was no efficiency resource that was cost-effective for utilities to pursue and the Commission did not challenge this. It took a new Governor and a legislated EERS to change the situation and only now are programs beginning. Furthermore, planning processes take time, delaying the start of programs by several years. An EERS can be enacted and programs quickly begun. Such an EERS should be based on levels of energy efficiency found to be achievable and cost-effective in a variety of states. States can then conduct planning processes to see if higher savings are achievable and cost-effective. For example, Connecticut has an EERS requiring 1% additional electricity savings each year, and they then conducted a planning process which is recommending much higher levels of efficiency savings.

2. In New Hampshire, we are addressing efficiency and energy conservation by taking auction revenues from RGGI, the United States' first cap-and-trade program for greenhouse gases, and investing those revenues in these energy saving and conservation efforts. In your view, is it more cost effective and efficient to establish an EERS mandate or invest auction revenues in efficiency and conservation measures? What are the trade-offs?

Response: The two policies are complimentary. An EERS sets savings targets. Use of auction revenue can help fund programs to reach those targets. Ideally both will be done. We believe it is important to set savings targets, so that progress can be monitored and programs encouraged to maximize savings per dollar invested. The goal is achieving savings, and spending money is just a means toward that end. If just funds are provided, it is unclear how much savings will be achieved and whether cost-effectiveness will be maximized.

3. It has often been said by those seeking to address climate change that the single most important thing we can do to address climate is put a price on carbon. A price on carbon will, in turn, incentivize renewable electricity and energy conservation measures. Is a national EERS necessary to deploy energy conservation and efficiency improvements if we enact a cap-and-trade program in the US?

Response: There are many market barriers that impede energy efficiency investments, as discussed in my written testimony. Due to these market barriers, many cost-effective efficiency investments are not being pursued today. Adding a carbon price will modestly increase energy prices and modestly increase efficiency investments. To more dramatically increase efficiency investments, supportive programs and policies are needed. In our view, an EERS is probably the most important of these policies.

4. There have been some who suggest an EERS will reduce the cost of a cap-and-trade program. A report by ACEEE states that, “energy efficiency reduces the cost of cap-and-trade because less new energy facilities are needed and also because a smaller portion of existing facilities need to be upgraded to help meet emissions ceilings.” By some estimates, electricity prices under cap-and-trade legislation may be 15 percent less if an EERS as well as an RES are also in place. Do you agree with this assessment?

Response: Yes, we wrote that assessment and we agree with it. I assume this question is more for the other witnesses and therefore will not elaborate further.

5. A key goal of U.S. energy policy is lessening our dependence on foreign oil. One way to achieve this goal would be a conversion of the transportation sector from petroleum to electricity through the phased-in and widespread use of hybrid cars, plug-in hybrid cars and fully electric cars. While this will lessen our dependence on foreign oil, it may put additional strains on our electricity system which may require additional generation investments.

I am interested to hear your thoughts on how does the EERS will affect en electrification of the transportation sector? How would these two important policy goals work together?

Response: Electrification of the transportation sector is in its infancy and therefore will have little effect on EERS targets in the early years. As noted in my written testimony, we recommend that DOE monitor the success of efforts to electrify the transportation sector, and consider increased electricity sales from transportation, and opportunities for efficiency improvements in transportation, when setting future EERS targets. If efforts to electrify the transportation sector are effective, we would expect this to have a significant effect on future targets.

6. How are other countries addressing energy efficiency and conservation? Have other countries adopted an EERS, or a similar mandate?

Response: EERS-like policies are becoming common in Europe. These policies are often called “white certificates” in Europe, while renewable energy standards are generally called “green certificates”. The United Kingdom has had residential energy savings targets since 2002 and is now in their third three-year implementation period. Utilities exceeded targets for the first two implementation periods. Italy, France, Denmark and the Flanders region of Belgium are all

implementing white certificate programs and our understanding is that targets are being met. For example, in Italy the targets apply to electric and gas utilities and are expressed in tons of oil equivalent (TOE). In Italy, the 2005-2007 target was 1.1 TOE, but utilities and third-party providers together achieved 2.0 TOE of savings. In addition, Poland is now developing a program. Furthermore, the entire European Union (EU) has adopted the “Energy Services Directive” which directs all member states to develop policies to achieve 20% energy efficiency savings by 2020. The various member-states have prepared initial plans and are now refining their plans and starting to implement them.<sup>2</sup>

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<sup>2</sup> Information on many of the European programs can be found at:  
<http://re.jrc.ec.europa.eu/energyefficiency/events.htm>