Comments of the American Council for an Energy-Efficient Economy
Senate Energy Committee Hearing on
Power Generation Resource Incentives and Diversity Standards

March 8, 2005

Summary

We appreciate the fact that the Committee is holding a hearing on Power Generation Resource Incentives and Diversity Standards. We support adding such standards to pending federal energy legislation. However, we believe it was an oversight not to include a witness who can discuss the role of energy efficiency resources in incentives and diversity standards. Energy efficiency resources are an important cornerstone for America's energy policy. Energy efficiency has saved consumers and businesses trillions of dollars in the past two decades, including more than half a trillion dollars in 2004 alone. And we have barely begun to capture the full savings that are available. Many studies indicate that U.S. energy use can be cost-effectively reduced by 20% or more if the proper policy support is provided.

A key policy ACEEE has proposed to the Senate Energy Committee is an Energy Efficiency Resource Standard (EERS). An EERS is a simple, market-based mechanism to encourage more efficient generation, transmission, and use of electricity and natural gas. An EERS consists of electric and gas end-use savings targets for retail utilities, with flexibility to achieve them through a market-based trading system. With trading, utilities that save more than their target can sell savings credits to utilities that fall short of their savings targets. Trading would also permit the market to find the lowest-cost savings nationwide. However, unlike other resources such as renewable energy and coal, energy efficiency resources are distributed throughout the 50 states – studies on many states have found cost-effective opportunities to reduce electric end-use energy use by 20% or more.

We recommend that the EERS targets for electricity and natural gas start at modest levels (e.g. 0.25% of sales annually) and ramp-up over several years to savings levels currently achieved by the most successful states (e.g. 0.75% of sales annually). Peak electricity demand savings should also be included. To ensure that costs will be moderate, in addition to permitting trading, we recommend that electric and gas utilities be permitted to buy credits for 3 cents per kWh of electricity or 30 cents per therm of gas, which is less than half of the current retail cost of these energy sources.

EERS-like laws are now in operation in several states and countries. Texas's electricity restructuring law 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. Pennsylvania's new Alternative Energy Portfolio Standard includes end-use efficiency among other clean energy resources. The Governor of Illinois has just proposed an EERS, based on the Texas program but with higher savings targets. EERS-like programs have also been established in the United Kingdom and Italy and are being considered by other countries.

Because EERS annual requirements are cumulative, over a decade annual savings would steadily mount. Under our proposal, after ten years, annual electricity and natural gas use will be reduced by 6.75% below current forecasts. EERS savings would amount to roughly half of the currently projected *growth* in electric sales over the decade 2006-2016 and over one-half of projected growth in natural gas sales over this same period. We are now preparing a more specific analysis of savings from an EERS and other federal policy options, and plan to release a report on this topic in about a month. Our preliminary estimate is that an EERS would reduce U.S. energy use by about 27 quadrillion Btu ("quads") on a cumulative basis by 2020, and 2.1 quads annually after the ramp-up is complete. The annual savings represent about 2% of U.S. energy use. These savings are roughly equal to the savings from the efficiency provisions in S. 2095, and thus addition of an EERS would approximately double the energy savings in the federal energy bill. We also estimate that energy bill savings from an EERS will total about $155 billion on a cumulative basis through 2020, including annual savings of about $12 billion once the ramp-up is complete.

While we support an EERS, we also recognize that opinions about this aspect of energy policy are diverse, and hence thoughtful compromises may be needed to allow effectual policies to proceed. We recognize that a variety of energy resources will be needed in the U.S. to meet future needs, and therefore it behooves the U.S. to encourage the development of clean new advanced energy sources. Such resources clearly include renewable energy, and in the views of many stakeholders, also include "clean coal" and advanced nuclear generation. We offer several options for combining an EERS with these advanced energy sources. First, a Clean Energy Resource Standard (CERS) could be enacted that requires that a specified amount of energy come from qualified clean sources, with targets gradually rising over time. A single target could be set and the various technologies allowed to compete in the market to most economically meet these targets, or minimums or maximums could be set for specific sources. Second, a point system could be established that favor some sources over other sources based on their characteristics, and targets set in terms of the number of points that energy suppliers need to earn. A point system is more complicated, but could be used to avoid controversies over minimum targets for specific technologies.

We recommend that the Senate Energy Committee seriously explore these options. If these options, including energy efficiency resources, are "left on the table", an energy bill is likely to be modest, and unlikely to truly address our nation's energy problems.

Introduction

ACEEE is a nonprofit organization dedicated to increasing energy efficiency as a means for promoting both economic prosperity and environmental protection. We were founded in 1980 and have contributed in key ways to energy legislation adopted during the past 20 years, including the *Energy Policy Act of 1992* and the *National Appliance Energy Conservation Act of 1987*.

We appreciate the fact that the Committee is holding a hearing on Power Generation Resource Incentives and Diversity Standards. We support adding such standards to pending federal energy legislation. However, we believe it was an oversight not to include a witness who can discuss the role of energy efficiency resources in incentives and diversity standards. The states of Texas and Pennsylvania now have resource standards that include energy efficiency resources, as do the United Kingdom and Italy. Proposals are now pending in several other states. We recommend that energy efficiency resources be included as part of any resource standard reported out by the Committee.

Importance of Energy Efficiency to the Nation

Energy efficiency improvement has contributed a great deal to our nation's economic growth and increased standard of living over the past 30 years. Energy efficiency improvements since 1973 accounted for approximately 50 quadrillion Btu ("Quads") in 2003, which is *more than half of U.S. energy use and nearly as much energy as we now get annually from domestic coal, natural gas, and oil sources combined.* Thus, energy efficiency can rightfully be called our country's largest energy source.

Even though the United States is much more energy-efficient today than it was 30 years ago, enormous potential remains for additional cost-effective energy savings. Some newer energy efficiency measures have barely begun to be adopted. Other efficiency measures could be developed and commercialized in coming years, with proper support:

- The Department of Energy's national laboratories estimate that increasing energy efficiency throughout the economy could cut national energy use by 10 percent or more in 2010 and about 20 percent in 2020, with net economic benefits for consumers and businesses.[1]

- ACEEE, in our *Smart Energy Policies* report, estimates that adopting a comprehensive set of policies for advancing energy efficiency could lower national energy use from EIA projections by as much as 11 percent in 2010 and 26 percent in 2020.[2]

[1] Interlaboratory Working Group, 2000, *Scenarios for a Clean Energy Future*. Washington, D.C.: Interlaboratory Working Group on Energy-Efficient and Clean-Energy Technologies, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy.

[2] Nadel and Geller, 2001, *Smart Energy Policies: Saving Money and Reducing Pollutant Emissions Through Greater Energy Efficiency*, www.aceee.org/ energy/reports.htm. Washington, DC: American Council for an Energy-Efficient Economy.

- The opportunity for saving energy is also illustrated by experience in California in 2001. Prior to 2001 California was already one of the most-efficient states in terms of energy use per unit gross state product (ranking 5th in 1997 out of 50 states[3]). But in response to pressing electricity problems, California homeowners and businesses reduced energy use by 6.7% in summer 2001 relative to the year before (after adjusting for economic growth and weather)[4], with savings costing an average of 3 cents per kWh,[5] far less than the typical retail or even wholesale price of electricity.

Unfortunately, a variety of market barriers keep these savings from being implemented. These barriers are many-fold and include such factors as "split incentives" (landlords and builders often do not make efficiency investments because the benefits of lower energy bills are received by tenants and homebuyers); panic purchases (when a product such as a refrigerator needs replacement, there often isn't time to research energy-saving options); and bundling of energy-saving features with high-cost extra "bells and whistles."

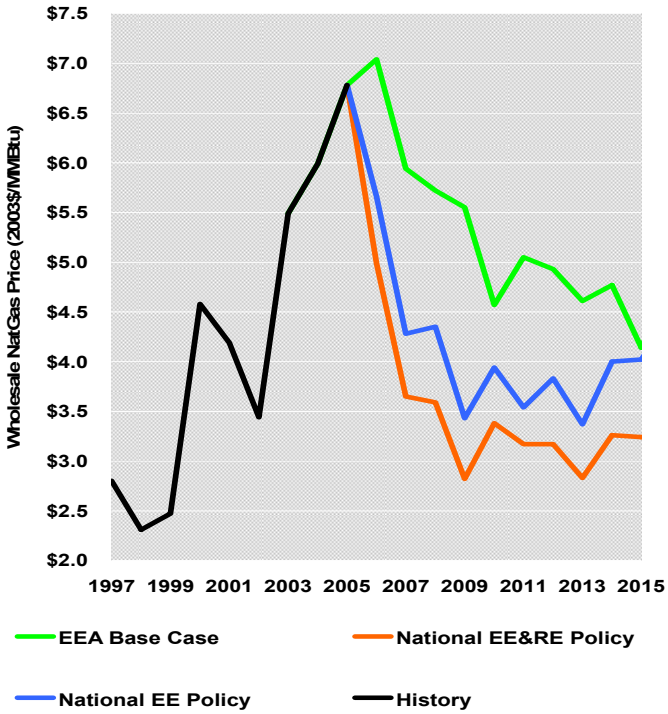
Furthermore, recent developments indicate that the U.S. needs to *accelerate* efforts to implement energy efficiency improvements:

- Oil, gasoline and natural gas prices have risen substantially since 2000. Energy efficiency can reduce demand for these fuels, reducing upward price pressure and also reducing fuel-price volatility, making it easier for businesses to plan their investments. Prices are determined by the interaction of supply and demand—if we seek to address supply and not demand, it's like entering a boxing match with one hand tied behind our back.

- A recent ACEEE analysis found that gas markets are so tight that if we can reduce gas demand by as little as 4% over the next five years, we can reduce wholesale natural gas prices more than 25%.[6] This analysis was conducted by Energy and Economic Analysis, the same analysis firm using the same computer model that was employed by DOE and the National Petroleum Council for their 2003 study on U.S. natural gas markets. Results of this analysis are shown in the figure below. These savings would put over $100 billion back into the U.S. economy. Moreover, this investment would help bring back U.S. manufacturing jobs that have been lost to high gas prices, and would help relieve the crushing burden of natural gas costs experienced by many households, including low-income households. Importantly, much of the gas savings in this analysis comes from electricity efficiency measures, because so much electricity is generated by natural gas, often inefficiently.

[3] Geller and Kubo, 2000, *National and State Energy Use and Carbon Emissions Trends*. Washington, DC: American Council for an Energy-Efficient Economy.
[4] California Energy Commission, 2001, *Emergency Conservation and Supply Response 2001.* Report P700-01-005F. Sacramento, CA.
[5] Global Energy Partners, 2003, *California Summary Study of 2001 Energy Efficiency Programs, Final Report.* Lafayette, CA.
[6] Elliott, R.N., A.M. Shipley, S. Nadel and L. Brown. 2003. *Natural Gas Price Effects of Energy Efficiency and Renewable Energy Practices and Policies*. Report Number E032, http://aceee.org/energy/efnatgas-study.htm. Washington, D.C.: American Council for an Energy-Efficient Economy.

Impacts of Energy Efficiency and Renewable Energy on Wholesale Gas Prices



- The U.S. economy has had sub-par performance for several years. While the economy is improving, additional boosts will help. Energy efficiency investments often have financial returns of 30% or more, helping to reduce operating costs and improve profitability. In addition, by reducing operating costs, efficiency investments free up funds to spend on other goods and services, creating what economists call the "multiplier effect", and helping the economy broadly. A 1997 study found that due to this effect, an aggressive set of efficiency policies could add about 770,000 jobs to the U.S. economy by 2010.[7]

- Emissions of gases contributing to global climate change continue to increase. Early signs of the impact of these changes are becoming apparent in Alaska. Energy efficiency is the most cost-effective way to reduce these emissions, as efficiency investments generally pay for themselves with energy savings, providing no-cost emissions reductions.

Energy efficiency also draws broad popular support. For example, in a May 2001 Gallop Poll, 47% of respondents said the U.S. should emphasize "more conservation" versus only 35% who said we should emphasize production (an additional 14% volunteered "both"). In this same poll, when read a list of 11 actions to deal with the energy situation, the top four actions (supported by 85-91% of respondents) were "invest in new sources of energy," "mandate more energy-efficient appliances," "mandate more energy-efficient new buildings," and "mandate more energy-efficient

[7] Alliance to Save Energy et al., 1997, *Energy Innovations: A Prosperous Path to a Clean Environment.* Washington, DC: American Council for an Energy-Efficient Economy.

cars." Options for increasing energy supply and delivery generally received significantly less support.[8]

Furthermore, increasing energy efficiency does not present a trade-off between enhancing national security and energy reliability on the one hand, and protecting the environment or community safety on the other, as do a number of energy supply options. Increasing energy efficiency is a "win-win" strategy from the perspective of economic growth, national security, reliability, and environmental protection.

We are not saying that energy efficiency alone will solve our energy problems. Even with aggressive actions to promote energy efficiency, U.S. energy consumption is likely to rise for more than a decade, and this growth, combined with retirements of some aging facilities, will mean that new energy supplies and energy infrastructure will be needed. But aggressive steps to promote energy efficiency will substantially cut our energy supply and energy infrastructure problems, reducing the economic cost, political controversy, and environmental impact of energy supply enhancements. Energy efficiency also buys the U.S. time to make the "best" supply and infrastructure investments, because energy efficiency resources can be implemented today, while almost all supply investments will take years to actually provide new resources.

Energy Efficiency in Pending Federal Energy Legislation

The provisions in the Energy Policy Act of 2004 (i.e. S. 2095) take moderate steps to address natural gas and electricity use. Notable efficiency provisions in this Act include:

1. Enactment of consensus equipment efficiency standards on six products plus DOE rulemakings to set efficiency standards on six more products.
2. Tax incentives for advanced energy-saving products and buildings.
3. Enhancements to the appliance labeling program, Federal Energy Management Program and programs that seek voluntary efficiency commitments from industrial firms.
4. Updated authorizations for advanced energy research including energy efficiency.

We support these provisions. Taken together, in 2003 we estimated that these provisions will reduce U.S. energy use by about 1.5% cumulatively over the 2004-2020 period, including approximately a 3% reduction in 2020. By 2020 we estimated that these provisions will also displace the need for nearly 300 new power plants of 300 MW each. These are substantial positive impacts and well worth pursuing. We are now in the process of revising our savings estimates and expect to have updated figures published in about a month.

However, while the provisions discussed above are a reasonable start, much more can and should be done to improve U.S. energy efficiency. Of the items that can be added to the bill, probably the most important would be an Energy Efficiency Resource Standard (EERS) or its equivalent.

[8] Moore, David, 2001, "Energy Crisis: Americans Lean toward Conservation over Production." Princeton, N.J.: The Gallup Organization.

An Energy Efficiency Resource Standard

An Energy Efficiency Resource Standard (EERS) is a simple, market-based mechanism to encourage more efficient customer energy use. An EERS consists of electric and gas end-user savings targets for retail utilities, with flexibility to achieve them through a market-based trading system. With trading, utilities that save more than their target can sell savings credits to utilities that fall short of their savings targets. Trading would also permit the market to find the lowest-cost savings nationwide. However, unlike other resources such as renewable energy and coal, energy efficiency resources are distributed throughout the 50 states – studies on many states have found cost-effective opportunities to reduce energy use by 20% or more.

We recommend that the EERS targets start at modest levels (e.g. 0.25% of sales annually) and ramp-up over several years to savings levels currently achieved by the most successful states (e.g. 0.75% of sales annually). Peak electricity demand savings should also be included, building on a proposal in H.R. 3406 (section 103) introduced by Rep. Barton in the 107th Congress. To ensure that costs will be moderate, in addition to permitting trading, we recommend that electric and gas utilities be permitted to buy credits for 3 cents per kWh of electricity or 30 cents per therm of gas, which is less than half of the current retail cost of these energy sources. States should also be encouraged to reform their utility regulations, so that utility revenues and profits are sustained regardless of fluctuations in sales—several states have already taken this step.

EERS-like laws are now in operation in several states and countries. Texas's electricity restructuring law (SB-7 1999)[9] 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 their targets. Pennsylvania's new Alternative Energy Portfolio Standard includes end-use efficiency among other clean energy resources. The Governor of Illinois has just proposed an EERS, based on the Texas program but with higher savings targets. EERS-like programs have also been established in the United Kingdom and Italy and are being considered by other countries.

How does the EEPS work?

The EERS would require retail electricity and natural gas suppliers (as defined in S. 2095) to secure annual savings of 0.25-0.75% of their most recent year's sales to retail customers as reported to the Energy Information Administration. These savings can be achieved flexibly through end-use efficiency improvements at customer facilities, including energy efficiency improvements in customer combined heat and power systems. Under our proposal, retailers will have the ability to defer improvements for a year, and a credit and trading system, plus a cash buyout option, will give retailers and other market players added flexibility to buy and sell credits to meet their targets.

How will the EEPS be administered?

[9] See http://texas.efficiencylink.net/ for additional information.

We recommend that the Department of Energy administer the EERS, although states should have the option to act as sub-administrators if they so choose. DOE already collects much of the data needed to administer an EERS program: annual electricity sales, power plant operating data, and utility efficiency program savings. DOE should be directed to conduct a rulemaking to work out the details of an EERS including eligible measures, how savings will be measured, how the credit and trading system will work, and reporting requirements.

Timeframe

We recommend that the savings requirement be in effect for a ten-year period, and could be extended by Congress assuming it is working well. Electricity and natural gas retailers would have flexibility in meeting the standard over this period. Annual requirements could be deferred for up to three years, as long as the total ten-year goal is achieved within the ten-year timeframe.

Buyout Option

Electricity suppliers would have the option of "buying out" of the EERS requirement by paying a defined amount, set at $.03 per kilowatt-hour of electricity or $0.30 per therm of natural gas. This level effectively serves as a price cap on the cost of the EERS for individual electricity suppliers. To encourage timely implementation, suppliers who subsequently fail to meet their requirements under the standard would be assessed a fee of $.035 per kWh or $0.35 per therm of natural gas of shortfall. Funds collected through both charges would be conveyed to states through grants to support their energy efficiency programs.

Market-Based System of Tradable Credits

A system of tradable credits, along with rules for the measurement and verification (M&V) of savings, would be developed to administer the standard in a market-based manner. The Department of Energy would develop M&V rules based on established M&V protocols where available, and the credit and trading system based on federal databases of generation facilities and on existing emissions trading systems. Under the credit trading system, retail utilities could buy and sell credits for efficiency. In addition, other entities could sell credits that they control, including end-users and efficiency aggregators, states, and private energy service companies.

Eligible Measures

Measures eligible for credits should include end-use efficiency measures at customer facilities, with credits for each measure type defined in the M&V rules.

Illustrative Example

A retail electricity supplier with 1 million customers sells 10 billion kWh in 2003. Its EERS target for would be about 25 million kWh in the first year, an additional 50 million kWh in the second year, and an additional 75 million kWh in the third year. It assembles a "portfolio" of energy savings credits through:

1. In year one, gaining credit for its current energy efficiency incentive programs, which currently produce 35 million kWh in savings. These savings exceed the first year target and they sell 10 million kWh in savings credits to another utility.
2. In year two, expanding current energy efficiency programs to 60 million kWh of savings per year. This would exceed its second year target, leaving 10 million kWh of credits for the third year.
3. In year 3, continuing energy efficiency programs to save 60 million kWh, and gaining 5 million kWh of credits by helping a large customer install a CHP system. These savings, plus the 10 million kWh extra from year two bring them into compliance with their year 3 target.
4. In year 4, continuing energy efficiency programs and CHP to save 65 million kWh, and buying 10 million kWh of credits from a state with very active efficiency programs.

By the tenth year, the supplier will likely be saving over half a billion kWh per year. It files annual reports with DOE on its baseline sales, its current year savings target, and verification data for the portfolio of savings it has assembled to meet the target.

Relationship to a Renewable or Other Clean Energy Portfolio Standard

The EERS as proposed here would complement, but not replace, a conventional renewable portfolio standard, such as the one passed by the Senate in 2002. Both proposals would apply to the same group of retail electricity suppliers, and the parallel credit trading systems of both proposals offer opportunities for synergies in administration. Indeed, the measures could be combined, and other clean energy resources could also be included, if separately stated requirements for renewable energy were maintained, to ensure that low-cost efficiency investments did not eliminate the incentive for investment in renewable power development. We recognize that even though efficiency can provide low-cost energy resources, clean new generation technologies will be needed to make the nation's energy system environmentally and economically sustainable.

Energy Savings

Because EERS annual requirements are cumulative, over a decade annual savings would steadily mount. Under our proposal, after ten years, annual electricity and natural gas use will be reduced by 6.75%. EERS savings would amount to one-half of the currently projected *growth* in electric sales over the decade 2006-2016 and over one-half of projected growth in natural gas sales over this same period.

We are now preparing a more specific analysis of savings from an EERS and other federal policy options and plan to release a report on this topic in about a month. Our preliminary estimate is that an EERS would save about 1,800 billion kWh of electricity and 17, 500 billion cubic feet of natural gas on a *cumulative* basis by 2020. Savings would start small and gradually ramp up. After the ten-year ramp-up is completed, we estimate that *annual* savings will total about 140 billion kWh and 1,300 billion cubic feet of gas. After the ramp-up, the EERS will reduce peak electric demand by about 38,600 MW, equivalent to 129 power plants (300 MW each). Overall,

the EERS will reduce U.S. energy use by about 27 quadrillion Btu ("quads") on a cumulative basis by 2020, and 2.1 quads annually after the ramp-up is complete. The annual savings represent about 2% of U.S. energy use. These savings are roughly equal to the savings from the efficiency provisions in S. 2095, and thus addition of an EERS would approximately double the energy savings in the federal energy bill.

Our preliminary analysis also estimates economic savings from an EERS. We estimate the energy bill savings from an EERS will total about $155 billion on a cumulative basis through 2020, including annual savings of about $12 billion once the ramp-up is complete. Our review of the literature indicates that the benefits from the types of efficiency programs encouraged by an EERS are typically about two times the costs (costs for energy saving equipment and practices, plus utility administrative costs). This implies net savings (net of costs) to U.S. consumers and businesses of about $75 billion cumulatively by 2020.

Other Options

While we support an EERS, we also recognize that opinions about this important aspect of national energy policy are diverse, and that thoughtful compromises may be needed to allow an effectual policy consensus to be formed. We recognize that a variety of energy sources will be needed in the U.S. to meet future needs, and therefore it behooves the Federal government to encourage the development of clean new advanced energy sources. Such sources clearly include renewable energy, and in the views of many stakeholders, also include "clean coal" and advanced nuclear generation. We offer several options for combining an EERS with these advanced energy sources. At this point, we are not endorsing any option, since "the devil is in the details". Instead we offer these options to encourage discussions.

First, a Clean Energy Resource Standard (CERS) could be enacted that requires that a specified amount of energy come from qualified clean sources, with targets gradually rising over time. Eligible sources might include some or all of the following:

- Energy efficiency
- Renewable energy
- Recycled energy (e.g., reuse of waste heat)
- Combined heat and power (CHP) systems (meeting specified efficiency and emissions criteria)
- Clean coal (e.g. meeting stringent criteria air pollutant emissions limits and with carbon capture and sequestration)
- Advanced nuclear power (e.g. "inherently safe" and certified by the NRC as able to withstand a direct hit from an Airbus A380)

A single target could be set and the various technologies allowed to compete in the market to most economically meet these targets. In addition, minimums or maximums could be set for specific resources to ensure adequate diversity of sources and support for the policy. Energy efficiency is likely to be less expensive than many other resources, and thus a cap may need to be set on the

energy efficiency resource that can be used to meet the target. Setting minimums for individual resources is likely to be difficult, and so we would lean away from setting minimums in favor of letting the other sources compete in the market.

Second, a point system could be established that favors some resources over other resources based on their characteristics (e.g., environmental friendliness), and targets set in terms of the total number of points that energy suppliers need to earn. For example, renewable energy sources could earn two points per kWh, energy efficiency one point per kWh, and clean coal and advanced nuclear one-half point per kWh. A point system is more complicated, but could be used to avoid controversies over minimum targets for specific technologies.

Conclusion

Energy efficiency resources are an important cornerstone for America's energy policy. Energy efficiency has saved consumers and businesses billions of dollars in the past two decades, but these efforts should be accelerated. A key policy to accelerate energy efficiency is an Energy Efficiency Resource Standard. Such a policy would:

- save consumers and businesses money;
- change the energy supply and demand balance and put downward pressure on energy prices;
- decrease reliance on energy imports (particularly liquefied natural gas whose use is projected to skyrocket in coming decades);
- help with economic development (since savings from energy efficiency generates jobs); and
- reduce carbon emissions, helping to moderate growth in the gases that contribute to global climate change.

The provisions in the draft Energy Policy Act of 2005 take modest steps to promote energy efficiency. We estimate that savings in the federal energy bill could be about doubled if an EERS were added.

However, an EERS is not the only option to achieve these savings. There are probably ways that efficiency, renewable energy, and other advanced energy sources can be joined in a combined Clean Energy Resource Standard. We recommend that the Senate Energy Committee seriously explore these options. If these options are “left on the table”, an energy bill is likely to be modest and unlikely to truly address our nation’s energy problems.