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Hearing on:
Energy Efficiency and the Enhanced Energy Security Act (S. 2747)

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Summary

Introduction

Energy efficiency is an important cornerstone for America's energy policy. Energy efficiency has saved consumers and businesses trillions of dollars in the past three decades, including about a trillion dollars in 2005 alone. These efforts should now be accelerated in order to:

- Save American consumers and businesses even more money;
- Change the energy supply and demand balance to put downward pressure on energy prices;
- Decrease America's addiction to oil, particularly oil imports;
- Strengthen our economy (since energy savings generate American jobs and capital investment);
- Buy us time to implement a comprehensive long-term energy strategy, and
- Reduce the risks of global warming by moderating carbon dioxide emissions growth.

Key Drivers

Prices of heating oil, gasoline, natural gas, and coal have risen 60–100% in the past three years (varying by fuel), driven by rising demand, tight supplies, and limited transportation and processing infrastructure. While prices are unlikely to return to the levels of three years ago, prices can be reduced through a combination of reduced demand and increased supplies. However, new supplies take time to develop, so energy efficiency is the only near-term option. A 2005 ACEEE analysis found that reducing natural gas use by about 4% over five years could reduce natural gas prices by over 20%. Reducing demand for oil and for refined petroleum products is also likely to reduce prices.

U.S. reliance on oil imports continues to rise and is projected to be near 70% of total U.S. oil demand by 2020. A substantial portion of this oil comes from unstable regions of the world. While moderate amounts of new oil are available in hard-to-reach areas of the U.S., they are not enough to offset continuing rapid depletion of North American fields. Moreover, much greater amounts of oil are available by increasing the efficiency with which we use oil. A January 2006 ACEEE study finds that we can reduce U.S. oil use by more than 5 million barrels per day by 2020. That's equivalent to almost doubling current U.S. oil production—which no serious petroleum expert views as possible. Improvements to passenger vehicles account for more than 3 million barrels per day of savings, but more than 2 million barrels per day of savings are available in the residential, commercial, and industrial sectors, and in heavy vehicles and airplanes. This suggests that oil-savings efforts should focus on all sectors, not just passenger vehicles.

Greenhouse gas emissions, especially carbon dioxide, continue to increase. Early signs of the impact of global warming are becoming apparent in Alaska and other parts of the Artic, and several recent papers have identified a link between warmer ocean temperatures and increased hurricane intensity. Energy efficiency is the most cost-effective way to reduce these emissions,

as efficiency investments generally pay for themselves with energy savings alone, providing no-cost emissions reductions. For example, a May 2006 ACEEE study found that the planned cap and trade system for power-sector carbon dioxide emissions in the northeastern U.S. can have a positive impact on the regional economy provided increased energy efficiency programs are a key part of implementation efforts.

Energy Policy Acts of 2005 and 1992

The Energy Policy Act of 2005 contained some useful energy efficiency provisions, particularly the new equipment efficiency standards and energy efficiency tax incentives. Other EPAct 2005 provisions may also help as well, but virtually all of these lack funding or other critical follow-up actions. Overall, ACEEE now estimates that the efficiency provisions in this law will reduce energy use in 2020 by 1.8 quadrillion Btu, which is 1.5% of projected national energy use. More than 75% of the savings are from equipment efficiency standards and efficiency tax incentives. Experience with the Energy Policy Act of 1992 showed a similar pattern—most of the savings came from a few provisions, and the majority of provisions proved to be more show than substance.

Key Priorities for New Legislation

Based on this past experience, we recommend that future legislative efforts focus on a few provisions that will result in substantial energy savings. We recommend four such provisions as follows:

1. *Oil savings targets*—S. 2747 sets oil savings targets that OMB and other agencies are tasked with meeting. This is a promising provision but needs to be backed by complementary actions that will make the targets enforceable, as well as authorize a variety of policies that OMB can choose among in order to meet the targets.

2. *A national energy efficiency resource standard*—An energy efficiency resource standard (EERS) consists of electric and/or gas energy savings targets for utilities, with flexibility to achieve the target through a market-based trading system. An EERS is similar to a renewable portfolio standard, but for energy efficiency savings instead of renewable energy generation. Policies along these lines have been adopted by eight states and several European countries. S. 2747 encourages states to consider EERSs but we recommend that this section be strengthened to establish a national EERS, with a national market-based trading system.

3. *Equipment and appliance efficiency standards*—Consensus efficiency standards were key successes in the last two Energy Policy Acts, and ACEEE is now working with industry and other stakeholders to negotiate additional consensus standards. We recommend that any consensus agreements that emerge be incorporated into legislation. In addition, new

legislation should authorize DOE to consider separate standards for the North and South for heating and cooling equipment. The current one standard for all approach means that there will be clear winners and losers that can be avoided by customizing standards for each climate zone.

4. *Efficiency tax incentives*—Provisions in EPAct 2005 generally expire at the end of 2007, largely because the 2005 conferees were under pressure to reduce the amounts spent on tax incentives. These should be extended, to at least the original expiration dates, and a few refinements should also be considered.

Energy Savings

ACEEE estimates that together these four items can reduce U.S. energy use by more than 14 quads in 2020, reducing energy use by about 12%. *These savings would be more than seven times the efficiency savings of EPAct 2005.*

Conclusion

We urge the Committee to concentrate on the largest opportunities for improving energy efficiency and take concrete action on legislation in these four key priority areas. Failure to take these steps now will make it much more likely that our nation's energy problems will continue or even worsen, and that Congress and the nation will have to continue facing energy "crises" for many years to come.

Introduction

ACEEE is a nonprofit organization dedicated to increasing energy efficiency as a means of 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 25 years, including the Energy Policy Acts of 2005 and 1992 and the National Appliance Energy Conservation Act of 1987. I have testified before the Committee several times and appreciate the opportunity to do so again.

Energy efficiency improvements have 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 55 quadrillion Btus in 2005, 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 resources combined.*[1] Thus, energy efficiency can rightfully be called our country's largest energy source. If the United States had not dramatically reduced its energy intensity over the past 30 years, consumers and businesses would have spent roughly $1 *trillion* more on energy purchases in 2005.

Even though the United States is much more energy efficient today than it was 30 years ago, there is still enormous potential for additional cost-effective energy savings. Some newer energy efficiency technologies have barely begun to be adopted. Other efficiency measures could be developed and commercialized rapidly in coming years, with policy and program support. For example, in a study from 2000, the Department of Energy's national laboratories estimated 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.[2] Studies for many regions of the country have found similar if not even greater opportunities for cost-effective energy savings.[3]

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."

[1] Specifically, national energy intensity (energy use per unit of GDP) fell 46 percent between 1973 and 2003. About 60% of this decline is attributable to real energy efficiency improvements and about 40% is due to structural changes in the economy and fuel switching. Energy and GDP figures from Energy Information Administration, 2006, *Monthly Energy Review May 2006.* Washington, DC: U.S. Dept. of Energy. Proportion of gains due to efficiency from Murtishaw and Schipper, 2001, *Untangling Recent Trends in U.S. Energy Use*. Washington, D.C.: U.S. Environmental Protection Agency.

[2] 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.

[3] For a summary of many of these studies, see Nadel, Shipley and Elliott, 2004, *The Technical, Economic and Achievable Potential for Energy Efficiency in the U.S.: A Meta-Analysis of Recent Studies*. Washington, D.C.: American Council for an Energy-Efficient Economy.

Recent developments in energy markets indicate that the U.S. needs to *accelerate* efforts to implement energy efficiency improvements:

- Oil, gasoline, natural gas, and coal prices have risen substantially in recent years. For example, residential natural gas prices in 2005 averaged $13.83 per thousand cubic feet, up 61% from the average price three years earlier (prices averaged $8.57 per thousand cubic feet in 2002).[4] Likewise, retail gasoline prices are up 87% relative to three years ago ($2.917 per gallon 6/19/06 versus $1.558 per gallon 6/16/03).[5] Even more dramatically, Powder River Basin coal has more than doubled in price since three years ago (spot prices of $13.80 per short ton in May 2006, up from about $6 per short ton in May 2003).[6] 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 could reduce gas demand by as little as 4% over the next five years, we could reduce wholesale natural gas prices by more than 20%.[7] This analysis was conducted by Energy and Environmental Analysis, Inc. using its North American Gas Market Model, the same analysis firm and computer model that was employed by DOE and the National Petroleum Council for their 2003 study on U.S. natural gas markets.[8] 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 while also helping to 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 much of the marginal electric load is met by natural-gas fired power plants.

- The U.S. is growing increasingly dependent on imported oil, with imports accounting for more than 60% of U.S. oil consumption in 2005, of which more than 40% came from OPEC countries.[9] The U.S. Energy Information Administration estimates that imports will

[4] Energy Information Administration, 2006, *Natural Gas Navigator: U.S. Natural Gas Residential Price.* http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_nus_m.htm. *Vis*ited June 20. Washington, D.C.: U.S. Dept. of Energy.

[5] Energy Information Administration, 2006, *Petroleum Navigator: U.S. All Grades All Formulations Retail Gasoline Prices.* http://tonto.eia.doe.gov/dnav/pet/hist/mg_tt_usw.htm. *Vis*ited June 20. Washington, D.C.: U.S. Dept. of Energy.

[6] Energy Information Administration, 2006, *Coal News and Markets, Week of May 5, 2006.* http://www.eia.doe.gov/cneaf/coal/page/coalnews/coalmar.html#spot. Washington, D.C.: U.S. Dept. of Energy.

[7] Elliott and Shipley, 2005, *Impacts of Energy Efficiency and Renewable Energy on Natural Gas Markets: Updated and Expanded Analysis.* http://www.aceee.org/pubs/e052full.pdf. Washington, D.C.: American Council for an Energy-Efficient Economy.

[8] National Petroleum Commission. 2003, *Balancing Natural Gas Policy—Fueling the Demands of a Growing Economy: Volume I, Summary of Findings and Recommendations*. Washington, D.C.: U.S. Department of Energy.

[9] Energy Information Administration, 2006, *Monthly Energy Review May 2006.* Washington, DC: U.S. Department

account for 68% of U.S. oil use in 2020.[10] While moderate amounts of new oil resources are available in hard-to-reach areas of the U.S., much greater energy resources are available by increasing the efficiency with which we use oil. A January 2006 report by ACEEE found that the U.S. can reduce oil use by as much as 5.3 million barrels per day in 2020 through improved efficiency, including more than 2 million barrels per day in industry, buildings, heavy duty vehicles, and airplanes.[11] In other words, *there are substantial energy savings outside of the highly contentious area of light-duty vehicle fuel economy*. These 5.3 million barrels per day of oil savings are nearly as much as we presently import from OPEC (OPEC imports were 5.5 million barrels per day in 2005).[12] Energy efficiency can slow the growth in oil use, allowing a larger portion of our needs to be met from sources in the U.S. and friendly countries, as well as domestically produced alternative fuel sources.

- Economists have increasingly raised concerns that the U.S. economy is slowing and that robust growth rates we have had in recent years will not be sustained. Energy efficiency investments can spur economic growth; they often have financial returns of 30% or more, helping to reduce operating costs and improve productivity and 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. This stimulates new economic activity and job growth in the U.S., whereas most of every dollar we spend on oil flows overseas. 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.[13]

- While the U.S. overall has ample supplies of electricity at present, demand is rapidly growing and several regions (such as southwest Connecticut, Texas, New York, and California) are projecting a need for substantial new capacity in the next few years in order to keep reserve margins adequate.[14,15] Energy efficiency resource policies can slow growth rates, postponing the date that additional capacity will be needed.

- Greenhouse gas emissions continue to increase. Early signs of the impact of these changes are becoming apparent in Alaska and other Artic regions.[16] And several recent papers have

of Energy.

[10] Energy Information Administration, 2006, *Annual Energy Outlook.* Washington, D.C.: U.S. Department of Energy.

[11] Elliott, Langer and Nadel, 2006, *Reducing Oil Use Through Energy Efficiency: Opportunities Beyond Cars and Light Trucks.* Washington, DC:. American Council for an Energy-Efficient Economy.

[12] See note #9.

[13] 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.

[14] North American Electric Reliability Council, 2005, *2005 Long-Term Reliability Assessment: The Reliability of Bulk Electric Systems in North America.* Princeton, N.J.: North American Electric Reliability Council.

[15] New York Independent System Operator, 2005, "The NYISO Issues Reliability Needs Assessment." Press release of December 21. Schenectady, N.Y.: New York Independent System Operator.

[16] Hassol, 2004, *Impacts of a Warming Arctic: Arctic Climate Impact Assessment.* http://www.acia.uaf.edu. Cambridge University Press.

identified a link between warmer ocean temperatures and increased hurricane intensity.[17,18] Energy efficiency is the most cost-effective way to reduce these emissions, as efficiency investments generally pay for themselves with energy savings alone, providing no or negative-cost emissions reductions. The term "negative-cost" means that, because such efficiency investments produce net economic benefits, they achieve emission reductions at a net savings for the economy. This important point has been missed in much of the climate policy analysis modeling performed to date. Too many economic models are incapable of characterizing the real economic effects of efficiency investments, and so forecast inaccurate economic costs from climate policies. Fortunately, this kind of flawed policy analysis is beginning to be corrected. For example, a May 2006 study just released by ACEEE found that the Regional Greenhouse Gas Initiative (RGGI—the planned cap and trade system for greenhouse gases in the northeastern U.S.) can have a small but positive impact on the regional economy provided increased energy efficiency programs are a key part of implementation efforts.[19]

Energy efficiency also draws broad popular support. For example, in a March 2005 Gallup Poll, 61% of respondents said the U.S. should emphasize "more conservation," versus only 28% who said we should emphasize "production" (an additional 6.5% volunteered "both").[20] In an earlier May 2001 Gallup 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 cars." Options for increasing conventional energy supply and delivery generally received significantly less support.[21]

However, energy efficiency alone will not solve our energy problems. Even with aggressive actions to promote energy efficiency, U.S. energy consumption is likely to continue to rise for more than a decade, and this growth, combined with retirements of some aging resources and production facilities, will mean that some 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, while buying us time to implement a comprehensive, long-term energy strategy.

The Energy Policy Acts of 2005 and 1992

[17] Webster, Holland, Curry and Chang, 2005, "Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment." *Science,* 309, 16 September, 1844–1846.
[18] Emanuel, 2005, "Increasing Destructiveness of Tropical Cyclones over the Past 30 Years." *Nature,* 436, 4 August, 686–688.
[19] Prindle, Shipley and Elliott, 2006, *Energy Efficiency's Role in a Carbon Cap-and-Trade System: Modeling Results from the Regional Greenhouse Gas Initiative.* Washington, DC: American Council for an Energy-Efficient Economy.
[20] Gallop, 2005, "Gallop Poll Social Series—The Environment." Princeton, N.J.: The Gallop Organization.
[21] Moore, David, 2001, "Energy Crisis: Americans Lean toward Conservation over Production." Princeton, N.J.: The Gallup Organization.

The Energy Policy Act of 2005 (EPAct 2005) made some useful progress on energy efficiency. Particularly notable were sections that established new consensus, federal efficiency standards on 16 products and that created energy efficiency tax incentives. Other useful provisions included the extension of authority for Energy Saving Performance Contracts (ESPC) in federal facilities, and a variety of mandated reports that hopefully will help spur future policy action. For example, the EPAct 2005 provision requiring DOE to submit a plan to Congress on steps it will take to catch up on overdue efficiency standard rulemakings was timed just right, and DOE has now prepared and begun to implement this plan. In addition, a variety of promising initiatives were authorized in EPAct 2005, but to have an impact, need to be followed by appropriations.

Unfortunately, most of the new provisions requiring funding were not included in either the President's budget request or in the House appropriations bills (the Senate has yet to act). Given recent developments, such as the lack of funding for many of the EPAct 2005 provisions, ACEEE now estimates that the energy efficiency sections of EPAct 2005 will reduce U.S. energy use by about 1.8 quadrillion Btu ("quads") in 2020, reducing projected U.S. energy use in 2020 by 1.5%. Of these savings, more than 75% will come from two key provisions—equipment efficiency standards and energy efficiency tax incentives.[22]

A similar pattern applies to the Energy Policy Act of 1992 (EPAct 1992). This law also attempted to comprehensively address U.S. energy needs, including an energy efficiency title. ACEEE and the Alliance to Save Energy conducted a review of this law five years after passage and found that many of the provisions were not fully implemented due to limited funding, the fact that many provisions were voluntary and were largely ignored, and limited follow-through. For example, provisions calling for state action were ignored by many states, and only resulted in policy changes in a few states. Ultimately, most of the energy efficiency savings that actually occurred came from just a few provisions including a series of new equipment efficiency standards (which accounted for more than half the savings), equipment efficiency ratings, improvements to building codes, and some R&D efforts.[23]

Key Priorities for New Legislation

Based on the experience with EPAct 1992 and initial actions on EPAct 2005 implementation, we recommend that as the Energy Committee considers new energy efficiency legislation, it concentrate on a few provisions with significant energy savings, and that the Committee not spend a lot of time on provisions that may sound good on paper, but are unlikely to actually save much energy in practice. Based on our review of a variety of bills introduced in Congress and our read

[22] Nadel, Prindle and Brooks, 2006, "The Energy Policy Act of 2005: Energy Efficiency Provisions and Implications for Future Policy Efforts" in *Proceedings of the 2006 ACEEE Summer Study on Energy Efficiency in Buildings.* Washington, D.C.: American Council for an Energy-Efficient Economy.

[23] ACEEE and ASE, 1997, *Missing the Mark: Five-Year Report Card on the Energy Efficiency Provisions of the Energy Policy Act.* Washington, D.C.: American Council for an Energy-Efficient Economy and Alliance to Save Energy.

of the political situation, we recommend that a new energy efficiency bill emphasize four areas as follows:

1. Oil savings targets and associated policies;
2. Energy efficiency resource standards (energy-saving targets for utilities);
3. Equipment efficiency standards; and
4. Extensions and refinements of efficiency tax incentives in EPAct 2005.

Fortunately, S. 2747 (the subject of this hearing) and its companion S. 2748 address most of these items in some fashion, although in each case some further strengthening would be very helpful. In the remainder of my testimony I discuss these four priority areas, summarize the energy savings available from addressing these four key priorities, make some further comments on S. 2747, and then draw a few final conclusions.

Oil Savings Targets

The biggest shortfall in EPAct 2005 (and in EPAct 1992 as well) was the failure to address opportunities to use oil more efficiently. As I noted previously, U.S. dependence on oil imports is increasing and energy efficiency represents a key strategy for reducing this dependency. There are many strategies that can be employed to reduce oil use, of which improving passenger vehicle fuel economy is just one. Other strategies include:

- Improving the efficiency of buildings with oil and propane space heating and water heating. These systems are particularly common in the Northeast, and Midwest, and in rural areas that lack natural gas distribution systems.
- Reducing oil use in industry through such measures as improved boilers and process heating; increased recycling of waste materials; improved paving materials that reduce petroleum feedstock requirements; and energy efficiency improvements in off-highway equipment and operating practices.
- Improving the fuel economy of heavy vehicles, such as delivery trucks and tractor trailers.
- Promoting "smart growth" strategies so public transit is more assessable and driving distances are reduced.
- Improving the fuel efficiency of airplanes.

S. 2747 includes a provision directing the Office of Management and budget and other agencies to develop and implement a plan to reach specified oil savings targets, including 2.5 million barrels per day in 2016 and 10 million barrels per day in 2031. These targets represent approximately 10% of projected 2016 U.S. petroleum product use and approximately 35% of projected 2031 use. We strongly support this section and urge the Committee to incorporate it into the next major piece of energy legislation it reports out.

However, this provision is only useful if future administrations faithfully implement it. To increase the chances that this provision is fully implemented, we recommend that the following steps be taken:

1. The Committee should have legal counsel carefully review the language to make sure it is enforceable in a court of law. While we hope that legal action will never be needed, if legal action is clearly provided for, this will provide a significant incentive to future administrations to keep on track in implementing this provision.
2. The Committee should work closely with the Commerce Committee to make sure that a variety of strategies for meeting the targets are authorized, including heavy vehicle testing and fuel economy policies and replacement tire efficiency standards. The Committee should also encourage the Commerce Committee to develop initial near-term fuel economy targets (such as ones based on the 2002 National Academy study),[24] so that some savings will start to accrue even while the OMB-led process is put in place.
3. The Committee should work to authorize or put in place additional policies for achieving fuel savings such as: (a) revenue-neutral fees and rebates ("feebates") to encourage purchase of vehicles with above-average fuel economy and discourage purchase of below-average vehicles; and (b) a small fee on heating oil and propane purchases to fund programs to help homeowners and businesses reduce use of these fuels.[25]

Energy Efficiency Resource Standard

An energy efficiency resource standard (EERS) is a simple, market-based mechanism to encourage more efficient use of electricity and natural gas. An EERS consists of electric and/or gas energy savings targets for utilities, often with flexibility to achieve the target through a market-based trading system. An EERS is similar to a renewable portfolio standard, but for energy efficiency savings instead of renewable energy generation. Programs along these lines have been adopted by eight states and several European countries. All EERSs currently in place include end-user energy saving improvements that are aided and documented by utilities or other program operators.[26] Sometimes distribution system efficiency improvements, along with combined heat and power (CHP) systems and other high-efficiency distributed generation systems, are included as well. 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 permit the market to find the lowest-cost

[24] See National Research Council, 2002, *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards*. Washington, D.C.: National Academy Press.

[25] Specifically, we recommend a fee of 1–2 cents per gallon, with funds to be administered by the states. State allocations should be based on use of heating oil and propane by state, and a competitive RFP, in which states with the best program proposals receive extra funds. While many gas and electric utilities operate energy-saving programs, homeowners and businesses using heating oil and propane are generally left out. This proposed program would address this gap.

[26] Savings are documented in program evaluations, following evaluation guidelines specified by state utility commissions. State commissions have many resources to draw on to develop these guidelines, including guidelines from other states.

savings. However, unlike other resources such as renewable energy and coal, energy-saving opportunities are distributed throughout the 50 states.

Among the EERS-like laws now in operation, 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 there is discussion about increasing the targets. 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. Colorado's largest utility has energy savings goals as part of a settlement agreement approved by the Public Service Commission. And Illinois and New Jersey are planning to begin programs soon. EERS-like programs have been working well in the United Kingdom and the Flemish region of Belgium. Italy has recently started a program, and another is about to start in France. Details on each of these programs are provided in a March 2006 ACEEE report.[27]

S. 2747 includes a provision directing states to consider adoption of EERSs. However, experience under EPAct 1992 and 2005 is that few states follow up on these directives. Instead, we recommend that S. 2747 be amended to establish a national EERS, but allowing for state-based administration provided states meet certain basic criteria.

We recommend that EERS targets generally start at modest levels (e.g., savings of 0.25% of sales annually) and ramp-up over several years to savings levels currently achieved by states with substantial experience (e.g., 0.50% of gas sales, 0.75% of electric sales, and 1.0% of peak electric demand annually). To ensure that costs will be moderate, we recommend that a market for trading of savings credits be established and that a "safety valve" be created under which electric and gas utilities could buy credits from the implementing agency for about half of the current retail costs of each energy source (monies so collected should be used to fund public-benefit, government-operated energy efficiency programs).

While many EERSs are separate from a renewable portfolio standard, an option would be to combine renewable energy and energy efficiency in a single, combined portfolio standard. However, if this is done, the portfolio target should be significantly higher than if only renewable energy or if only energy efficiency were included. For example, a combined efficiency/renewables target might be 20% of 2020 sales, and not the 10% of 2020 sales that the Senate has previously passed as a renewable portfolio standard. Another option will be to add additional "advanced energy resources" to a portfolio standard such as "advanced coal" that includes carbon sequestration or new advanced nuclear reactors. Each of these resources has supporters and detractors, so a careful political calculus is needed to see which resources add

[27] Nadel, 2006, *Energy Efficiency Resource Standards: Experience and Recommendations.* Washington, D.C.: American Council for an Energy-Efficient Economy.

versus subtract votes. To the extent additional resources are added to a portfolio standard, the targets should be increased commensurately. In no case should utilities be allowed to reduce their renewables purchases below levels previously voted by the Senate.

Equipment Efficiency Standards

ACEEE, affected industries, and other stakeholders have a long history of negotiating consensus agreements on new efficiency standards. Many of these agreements were incorporated into the Energy Policy Acts of 1992 and 2005. ACEEE is now talking with industry about standards on additional products, and we expect to have agreements on several new standards by the end of the year. If we are successful, we urge the Committee to include these new consensus standards in legislation it works on next year. Products that may lend themselves to consensus standards include the following:

- Reflector lamps
- Pool heaters
- Metal halide luminaries
- Bottle-type drinking water dispensers
- Portable electric spas (hot tubs)
- Single-voltage external AC to DC and AC to AC power supplies
- Commercial hot-food holding cabinets
- Walk-in refrigerators and freezers

In addition, we recommend that current standards law be amended to permit DOE to divide the country into two climate zones when setting new standards for heating and cooling equipment. DOE's Office of General Counsel says they lack authority to set separate standards for different regions, and therefore must use a one size fits all approach. However, climate in the U.S. varies enormously from Alaska to Florida, and a one size fits all approach for the entire country does not make sense for some climate-sensitive products. For example, DOE is currently conducting a rulemaking on new standards for residential furnaces, a major consumer of natural gas. Condensing furnaces (e.g., those meeting the ENERGY STAR specification) are very cost-effective in Northern states, but may not be cost-effective in many Southern states. But a single climate zone approach would either mean setting a weak standard based on Southern needs and achieving little energy savings, or setting a stronger standard based on national average heating loads and imposing significant costs on warm states. Dividing the country into two climate regions would save substantial energy without imposing extra costs on warm states. An ACEEE analysis estimated that a condensing furnace standard in cold states would reduce national natural gas use by more than 150 billion cubic feet and will save consumers $3.2 billion (discounted net present value) for equipment sold by 2030.

Manufacturers claim that imposing separate standards for the North and South would create difficulties for them. However, manufacturers often have separate models for Northern and Southern climates (e.g., furnaces in the South often have larger fans in order to handle larger

cooling loads) and thus we think manufacturers are overstating the difficulties. To address this problem and the large energy and economic savings that are possible with regional standards, we recommend that current law be amended to grant DOE authority to consider separate standards for the North and South for residential heating and cooling systems. This amendment should require DOE to consider the advantages and disadvantages of regional differentiation based on criteria in the underlying law and decide whether regionally differentiated standards make sense for a particular product. To limit the impact on manufacturers, we recommend that the amendment permit only two zones and require zones to follow state boundaries and be fully contiguous (except Alaska and Hawaii).

Efficiency Tax Incentives

EPAct 2005 included a variety of very useful energy efficiency tax incentives including incentives for efficient commercial buildings, homes, appliances, heating and cooling equipment, and vehicles. However, pressure on conferees caused most of these incentives to be cut to only two years, which is too short a period to transform markets. S. 2748 extends most of these incentives for an additional three years and adds several new incentives that previously passed the Senate but were not included in the final EPAct 2005 conference agreement. In general we support the provisions of S. 2748, but recommend a few refinements as follows:

Commercial buildings: EPAct 2005 included an "interim" provision for lighting energy retrofits. We recommend that this provision be specifically included in any extension as this is the only provision that truly applies to existing commercial buildings. If cost becomes an issue, this lighting retrofit provision could expire earlier than the 2010 date for the other commercial building incentives.

New homes: EPAct 2005 includes incentives for new homes reducing energy use by 50% relative to a model energy code, and includes additional incentives for manufactured homes that either save 30% or that meet ENERGY STAR criteria. S. 2748 provides a 30% savings threshold for all new homes and continues the special ENERGY STAR provision for manufactured homes. We think the 30% credit for all homes will prove very expensive and recommend that it be dropped if cost becomes an issue. Also, for manufactured homes, the current ENERGY STAR specification is fairly weak and saves less than 30% in nearly all cases. We recommend that the manufactured home credit clearly call for 30% savings and not include an ENERGY STAR path unless the Secretary of the Treasury determines that meeting the ENERGY STAR specification will on average save 30% (this latter option will permit an updated ENERGY STAR spec to be included).

Heating and cooling equipment: We recommend that eligibility levels for a few products be modified in cases where very few products are on the market that qualify for the tax credits. Specifically, we recommend a 90% AFUE requirement for boilers and oil-fired furnaces, and that the heat pump credit specifically reference the highest Consortium for Energy Efficiency tier in place on Dec. 31, 2006. The credit for boilers and oil furnaces should also be increased to $300 to provide more incentive to manufacturers and consumers to develop and buy these products.

Existing homes: From reports we have heard from program operators, the current incentives are not encouraging much new investment. We recommend that future extensions include a performance-based component that provides incentives of $800–2,000 for reducing home energy use by 20–50%. Such a provision will offer a larger and more enticing incentive to consumers and will save a substantial amount of energy as contractors seek to reach and exceed the 20% savings threshold. A bill along these lines with broad support is now being crafted by Senators Snowe and Feinstein. Once ready, we recommend it be incorporated into future legislation.

Appliances: S. 2748 does not extend the tax credit for efficient appliances. We recommend that this credit also be extended, but that eligibility levels be increased so that only the most efficient products on the market are eligible for incentives.

Vehicles: Toyota has already hit the 60,000 vehicle cap set by EPAct 2005 for advanced vehicles. We support the provision in S. 2748 to lift this cap. However, if the costs of this provision prove too high, a compromise would be to set a vehicle cap per manufacturer per vehicle class (e.g., compact, intermediate, full size car, etc.) in order to encourage all manufacturers to sell full product lines of advanced vehicles.

Combined heat and power plants: This provision was passed by the Senate but dropped by conferees. Due to volatility of energy prices and onerous interconnection requirements and rates imposed by some utilities, the pace of CHP installations has slowed. These proposed tax incentives should help reverse this trend.

Microturbines and advanced meters: If funds are tight, we recommend that these provisions be dropped. Energy savings from both of these provisions are pretty small and not as cost-effective as the other efficiency incentive provisions.

Energy Savings

ACEEE has conducted a variety of analyses on savings from various energy efficiency provisions. Based on this work, we can approximate the savings from each of the four key priority areas discussed above. These estimates are preliminary and will be refined as the legislative process proceeds.

Measure	Savings in 2020 (quads)
Oil savings target	7.4
Energy efficiency resource standard	5.6
Equipment efficiency standards	0.4
Tax incentive extensions and refinements	0.7
Total	14.1

These savings total more than 14 quads and represent about 12% of projected 2020 U.S. energy use. *These savings are more than seven times greater than the efficiency savings in EPAct 2005.*

Additional Comments on S. 2747

S. 2747 contains additional provisions not discussed above as key priorities. In general we believe these provisions are worthwhile, although many of them are likely to have modest impacts. Below we provide brief comments on a few of these provisions.

Deployment of advanced vehicle technologies (Section 208): This provision requires that manufacturers not decrease fuel economy below 2002 levels in order to be eligible for incentives. We support the intent of providing grants only to manufacturers who do not reduce fuel economy, but recommend that this provision be refined to not take effect for two years and then to require that to be eligible, manufacturers must exceed their 2002 fuel economy by 6%, with this eligibility floor increasing 3–4% each year thereafter. Grants should go to companies that achieve at least minimal fuel economy improvements, but the two-year delay gives manufacturers time to hit initial targets. Some of these improvements are already required under recent actions raising fuel economy standards for light trucks.

Renewable portfolio standard (Section 301): We support this provision. We have not dwelled upon it as ACEEE concentrates on energy efficiency and not renewable energy. However, as I noted earlier, a renewable portfolio standard and energy efficiency resource standard nicely complement each other.

National media campaign (Section 403): A national media campaign is one of the few things that can be done to reduce energy use in 2006 and 2007. Such a campaign was authorized by Section 135 of EPAct 2005 but has not been funded. Section 403 of S. 2747 is a useful complement to the EPAct provision and hopefully has a better chance of receiving funding.

Conclusion

Energy efficiency is 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 in order to:

- Save American consumers and businesses even more money;
- Change the energy supply and demand balance to put downward pressure on energy prices;
- Decrease America's addiction to oil, particularly oil imports;
- Strengthen our economy (since energy savings generate American jobs and capital investment); and
- Reduce the risks of global warming by moderating carbon dioxide emissions growth.

The Energy Policy Act of 2005 took modest steps in this direction, particularly the sections establishing new appliance and equipment efficiency standards and tax incentives for advanced energy-saving equipment, vehicles, and buildings. Overall, we estimate that EPAct 2005 will reduce U.S. energy use by about 1.5% by 2020.

But much more can and should be done. We recommend that Congress include the following provisions in new legislation:

1. Oil savings targets and associated policies;
2. Energy efficiency resource standards (energy-saving targets for utilities);
3. New consensus equipment efficiency standards and enhancements to DOE's rulemaking authority;
4. Buy us time to implement a comprehensive long-term energy strategy, and
5. Extensions and refinements of efficiency tax incentives in EPAct 2005.

These provisions will increase energy savings relative to EPAct 2005 by more than a factor of seven, reducing U.S. energy use by about 12% in 2020. Failure to take these steps now will make it more likely that Congress and the nation will continue to face energy "crises" for many years to come.

This concludes my testimony. Thank you for the opportunity to present these views.