Testimony of William Prindle
Acting Executive Director
American Council for an Energy-Efficient Economy (ACEEE)

Before the Senate Committee on Commerce, Science, and Transportation
Science, Technology, and Innovation Subcommittee

Hearing on Energy Innovations

March 20, 2007

Summary

Energy efficiency is the "first fuel" in America's energy policy. Efficiency investment, as the cornerstone of a sound energy policy, must now be accelerated in order to:

- Wean America from its addiction to oil and so enhance our national security;
- Help American consumers and businesses cope with high energy bills;
- Bring balance to America's energy markets by softening energy prices;
- Strengthen our economy by generating American jobs and capital investment; and
- Start to meet the global warming challenge by moderating carbon dioxide emissions.

Efficiency Is the Engine of Economic Prosperity

The U.S. economy uses half as much energy to produce a dollar of output today as we used in the 1970s. In this context, efficiency is contributing more resource value to the economy than any single energy supply commodity, and has enabled our economy to weather the energy price storms of the last several years. For the near term, efficiency is our only realistic resource and policy choice for meeting these challenges. For the longer term, we will need to accelerate efficiency gains even further as traditional resources become more expensive and scarce.

But what *is* energy efficiency? More than a concept, efficiency accounts for a very large segment of the U.S. economy. ACEEE estimates that in 2006, total investment in energy supply systems, from pipelines to powerplants, totaled about $100 billion. But Americans also invest in energy demand technologies: energy-efficient products bearing the federal Energy Star label accounted for some $101 billion last year, in a range of home and business products. Since Energy Star products account for only about 1/3 of these markets in the aggregate, total revenues are likely in the range of $300 billion annually. And the Energy Star data does not include investments in high-efficiency commercial and industrial technologies, vehicles, combined heat and power systems, and others that would increase the size of the "efficiency economy" still further.

Accelerated Innovation Is Needed to Meet 21st Century Energy Challenges

On March 14, ACEEE joined with Philips Lighting Company and other groups in a 10-year initiative to improve the efficiency of the common light bulb by fourfold or more, saving consumers almost $20 billion in electric bills in 2016 while cutting carbon emissions by up to 140 million tons. This is symbolic of the kind of technology innovation that can transform our energy economy more completely than anything we have seen to date.

Energy efficiency is the essential common element in any policy approach to the unprecedented energy challenges of the 21st century. We must moderate demand growth to enable clean and secure energy sources to wean us from depreciating and dirty sources. This means doubling the rate of progress in energy productivity, through smart energy policies that use a sound mix of regulation and incentives to overcome large and persistent barriers to energy efficiency investment. Effective policies include energy data collection and reporting, research, development, demonstration and deployment, vehicle fuel economy policies, energy efficiency resource standards for utilities, appliance and equipment efficiency standards, and tax incentives.

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 Senate several times and appreciate the opportunity to do so before the Subcommittee.

Energy Efficiency as the Engine of Economic Prosperity

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 50 quadrillion Btu's 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.*[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 about $650 billion more on energy purchases in 2006.

Energy efficiency is measured not just in abstract terms like declining energy intensity, but also in concrete terms like product sales, job creation, and capital investment. ACEEE estimates that in 2006, total investment in energy supply systems, from pipelines to powerplants, totaled about $100 billion. But Americans also invest in energy-using technologies: energy-efficient products bearing the federal Energy Star label accounted for some $101 billion in sales last year, in a range of home and business products like home appliance, home electronics, heating and cooling systems, office equipment, lighting, and windows. These are large markets: our data show that, for example, that Americans buy some 11 million refrigerators, 64 million residential windows, 150 million pieces of office equipment, and about 1.5 billion light bulbs. We estimate that Energy Star products account for only about 1/3 of these markets in the aggregate, totaling some 330 million products, so one could project that total sales in these markets may be in the range of $300 billion annually. This suggests that, in rough terms, the U.S. economy spends perhaps three times as much per year on energy end-use technology as it does on energy supply technologies.

Moreover, the Energy Star data does not include investments in the 160,000 Energy Star new homes sold in 2005, or the high-efficiency commercial and industrial technologies, vehicles, combined heat and power systems, and others that would increase the size of the "efficiency economy" still further. While our analysis in this area continues, and we have not come to detailed conclusions on this topic, the data we have developed so far indicates that the demand side of the economy is very large in comparison with the supply side, and that efficiency investments in the aggregate account conservatively for over $100 billion.

These data help to erase a persistent misconception, which often occurs as an unstated assumption in many analyses, that energy efficiency is an economic "brake", that it involved reducing

[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.

economic output or slowing economic growth. This misconception tends to stem from confusing energy efficiency with energy conservation. Conservation means reducing our consumption of energy services, whereas efficiency means consuming the same level of energy services with reduced consumption of energy commodities. This distinction between energy services and energy commodities is important. It is energy services we want—cold beverages, hot showers, well-lit rooms, comfortable living spaces, information services—and we are typically indifferent as to how much of which kinds of energy commodities supply those services.

Energy conservation, cutting back on the level of energy service, can in theory have an economic "brake" effect, if there is no shift of technology or spending of energy savings on other goods. But conservation usually occurs during times of rising energy prices, so the total economic output of the energy sector may continue to rise, and consumers may spend energy savings on other goods. Efficiency, on the other hand, involves technology investment to replace less-efficient products and systems. These investments create an economic stimulus with ripple effects through the economy, and our macroeconomic analyses show that efficiency investments tend to produce greater net economic benefits, in the form of increased output, income, and employment, than do investments in supply-side technologies.

We estimate that energy efficiency has provided some 75% of the growth in energy services from the 1970s to the present. While efficiency is often invisible—today's refrigerators look and perform the same or better than 30 years, ago, but use 1/3 the energy—it is nonetheless measurable. And even though it is distributed in millions of individual buildings, vehicles, and devices, it has been and continues to be an effective engine of economic growth for the United States.

How Big Is the Efficiency Resource?

Even though we spend large amounts on efficient technology today, and the United States is thus much more energy-efficient 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 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.[2] Studies for many regions of the country have found similar if not even greater opportunities for cost-effective energy savings.[3]

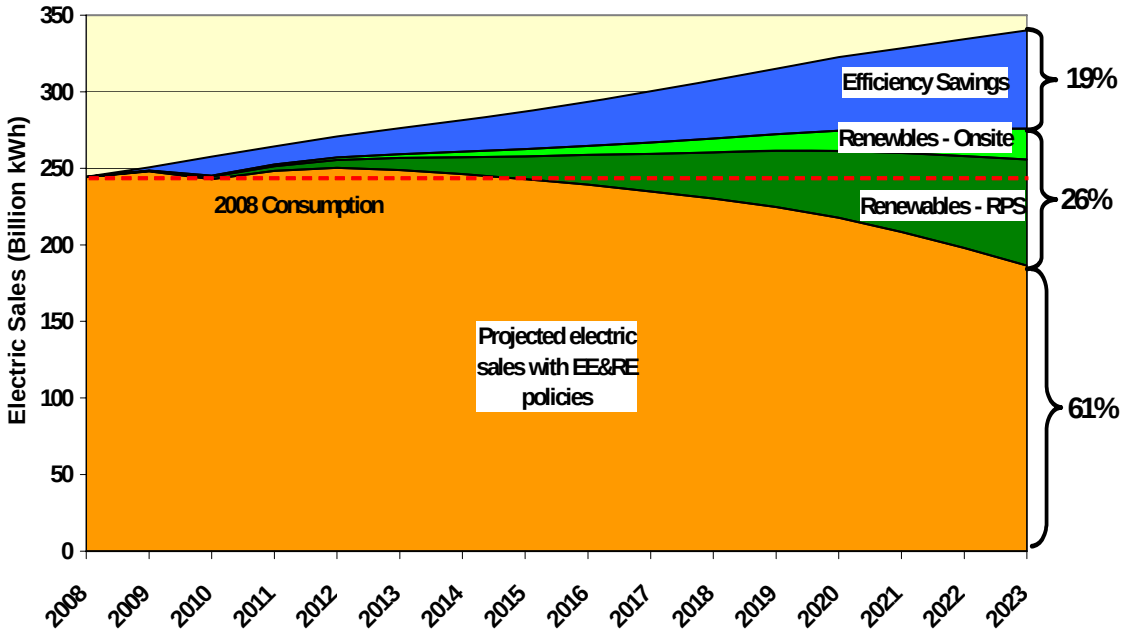
ACEEE recently completed major studies of the energy efficiency and renewable energy resource potential in the states of Texas and Florida. These studies showed and efficiency and renewables can meet all of the growth in energy service needs, even in such fast-growing states, over the next 15 years or more. The figures below summarize these results. While public and private

[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.

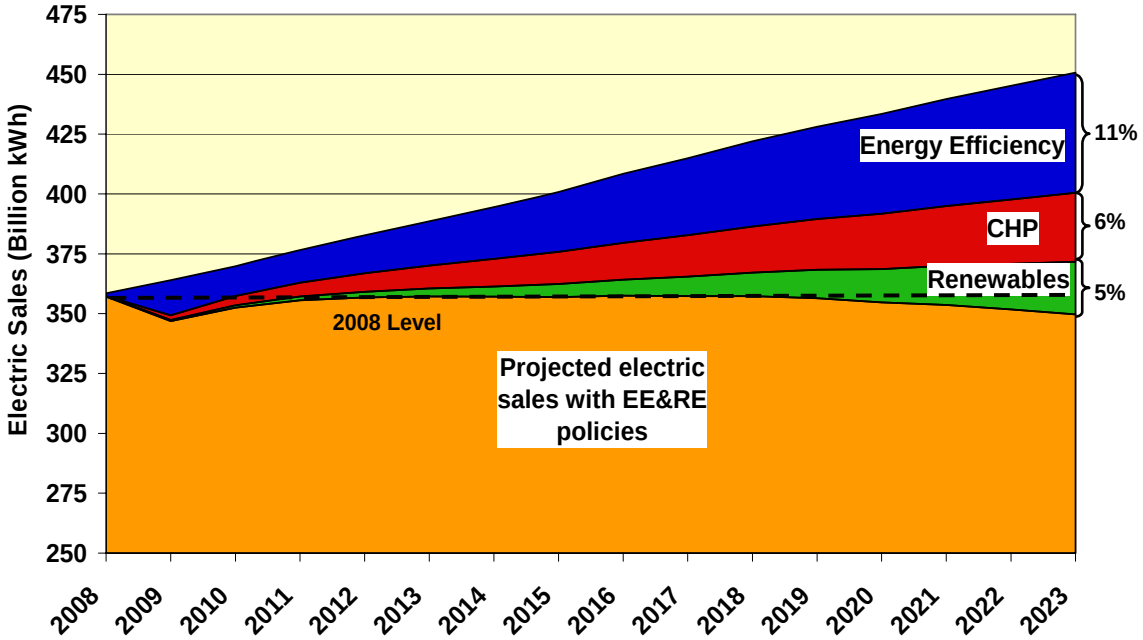
[3] For a summary of many of these studies, see Nadel, Shipley and Elliott, 2004, *The Technical, Economic and Achievable Potential for Energy-Efficiency in the U.S. – A Meta-Analysis of Recent Studies*. Washington, D.C.: American Council for an Energy-Efficient Economy.

investments are needed to develop them, these resources provide better returns to the economy than conventional energy supply investments.

Share of Florida's Future Electricity Needs that Can Be Met with Energy Efficiency and Renewable Energy



Share of Texas' Future Electricity Needs That Can Be Met with Efficiency and Renewables Resources



It should be noted that the efficiency potential analyses discussed here are inherently quite conservative. They are based on technologies that are established in the market today, and on

today's energy prices and technology costs. They are thus very conservative in the sense that new technologies, higher energy prices, and lower technology costs may well justify much greater estimates of efficiency potential. In the 1970s, for example, electricity growth rates were in the range of 3.5% per year. In that era, there was little of the high-efficiency technology we have today: examples include refrigerators that use 1/3 the energy of similar 1970s models; air conditioners that are twice as efficient; light bulbs that save ¾ the energy used by incandescent bulbs; LCD computer monitors that use ¼ the energy of CRT monitors; and the list goes on. Because of such technology advances, the Energy Information's 2007 Annual Energy Outlook projects that electricity demand will grow by only 1.5% annually through 2030, less than half of 1970s projections.

McKinsey Global Institute recently completed an analysis of global energy demand, and the potential for energy efficiency and related energy productivity gains to reduce current reference forecasts for energy demand growth. The study found that energy demand growth can be reduced by more than half by economically-viable technologies driven by public policies. It also found that in the U.S., energy consumption need not grow at all through 2030 if the cost-effective productivity improvements were realized in all sectors.[4]

The Case for Accelerated Policy Action on Efficiency

Policies Are Needed to Overcome Market Barriers

Regardless of the size of energy efficiency's aggregate potential, or of the cost-effectiveness of such investments, a variety of market barriers keep these technologies from being implemented. These barriers fall in two main categories: (1) principal-agent or "split incentive" barriers, in which, for example, home builders must invest added capital in efficient homes, but receive none of the energy savings benefits; and (2) transaction costs, which stem from inability of average consumers or businesses to make "economically optimum" decisions in time-and-information-limited real world conditions. A study ACEEE conducted for the International Energy Agency covering five countries found that half or more of the energy used in major home and business energy end-use markets are affected by the principal-agent barrier alone.[5]

In addition, basic forces in the economy work against the tendency of higher energy prices to moderate energy demand. This principle of "price elasticity of demand", while economically correct, is countered by "income elasticity of demand", under which rising incomes cause consumers to be less affected by rising prices. A large segment of our population continues to buy low-mileage, high prices vehicles, with little concern for fuel costs. For less-affluent consumers, "cross-elasticities" come into play, which cause them to keep using energy as an essential service, but to cut back on other goods to balance their budgets. Economists have documented the slowing of retail sales in response to rising energy prices. Both the income elasticity and cross-elasticity

---

[4] http://www.mckinsey.com/mgi/publications/Global_Energy_Demand/index.asp. We note that this is a proprietary, copyrighted analysis. The limited review in this testimony comes from information shared with the National Petroleum Council.

[5] Prindle et al. 2007. *Quantifying the Effects of Market Failures in the End-Use of Energy*. American Council for an Energy-Efficient Economy (forthcoming International Energy Agency publication)

effects suggest that energy prices alone won't balance our energy markets, and we need stronger energy policies if we want to stabilize energy markets without damaging our economy.

Reasons to Accelerate the Energy Efficiency Engine

Recent developments in our 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 have more than doubled since 2000, and retail gasoline prices are up by similar proportions. Even America's cheapest fuel, coal, has seen price inflation: Powder River Basin coal has more than doubled in price since 2003. 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.

- A recent ACEEE analysis found that natural 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%.[6] This analysis was conducted by Energy and Environmental Analysis, Inc. using their 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.[7] 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 also 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 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 2006, of which more than 40% came from OPEC countries.[8] The U.S. Energy Information Administration estimates that imports will account for 68% of U.S. oil use in 2020.[9] While moderate amounts of new oil are available in hard-to-reach areas of the U.S., much greater amounts of oil 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.[10] In other words, *there are substantial energy savings outside of*

[6] 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.

[7] 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.

[8] Energy Information Administration, 2006, *Monthly Energy Review May 2006.* Washington, DC: U.S. Dept. of Energy.

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

[10] 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.

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).[11] 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.

- 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 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.[12]

- Overall, the U.S. has ample supplies of electricity at present, but demand is growing and several regions are projecting a need for new capacity in the next few years in order to keep reserve margins adequate.[13] Energy efficiency resource policies can slow growth rates, postponing the date 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.[14] And several recent papers have identified a link between warmer ocean temperatures and increased hurricane intensity.[15,16] The Intergovernmental Panel on Climate Change's 2007 report[17] documents more conclusively than ever that human activity is affecting the global climate, and that the environmental and economic consequences of inaction may be severe. Energy efficiency is the most cost-effective way to reduce these emissions, as efficiency investments generally pay for themselves with energy savings, providing 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

---

[11] See note #9.

[12] 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.

[13] North American Electric Reliability Council, 2006, *2006 Long-Term Reliability Assessment: The Reliability of Bulk Electric Systems in North America.* Princeton, N.J.: North American Electric Reliability Council.

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

[15] Webster, Holland, Curry and Chang, 2005, "Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment." *Science*, 309, 16 September, 1844–1846.

[16] Emanuel, 2005, "Increasing Destructiveness of Tropical Cyclones over the Past 30 Years." *Nature,* 436, 4 August, 686–688.

[17] Intergovernmental Panel on Climate Change. *Climate Change 2007: The Fourth Assessment Report (AR4).* United Nations Environment Program, 2007.

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.[18]

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").[19] 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 energy supply and delivery generally received significantly less support.[20]

The Role of Innovation in Advancing Energy Efficiency

Technological innovation in energy efficiency, as is true of many facets of the U.S. economy, relies on a stream of innovations. ACEEE reviews emerging technologies in the buildings, industry, and transportation sectors, and periodically publishes reports on leading technologies. A summary of, and hyperlinks to, ACEEE reports on these technologies in the buildings sector can be found at the following World Wide Web address: http://www.aceee.org/emertech/buildings.htm#reports.

Our most recent buildings-sector technology assessment examines 72 emerging technologies in detail. While this testimony is too short for a full discussion of all of these innovations, I would like to use one technology—the residential incandescent light bulb—as an emblematic example. In our 2004 emerging technologies report, we examined several lighting technologies, including compact fluorescent fixtures, halogen lighting, and light-emitting diode (LED) lighting. All of these show promise as alternatives to the incandescent light bulb that has been the most common form of residential electric lighting for more than a century. It still accounts for more than 90% of total residential lighting sales in the U.S.

On March 14, 2007, ACEEE and other organizations announced a new coalition effort, initiated by Philips Lighting Company, that will fundamentally change the U.S. home lighting market in 10 years. By setting new high-performance targets for typical lighting applications, we expect to reduce residential lighting consumption by as much as 90%. While such standards are technology-neutral, based on our emerging technologies analysis we expect that compact fluorescents, halogens, and LEDs will all play a role in this transformation.

The residential light bulb was the first universal electricity end-use application when the electricity industry first developed in the 19th century. Its main role in those early years was to

[18] 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.
[19] Gallop, 2005, "Gallop Poll Social Series—The Environment." Princeton, N.J.: The Gallop Organization.
[20] Moore, David, 2001, "Energy Crisis: Americans Lean toward Conservation over Production." Princeton, N.J.: The Gallup Organization.

create a universal, electric lighting energy service technology. Until the advent of the electric light bulb, lighting energy services were met by kerosene, whale oil, and of course paraffin (which we use as candles). Electric lights were the first in a long line of electricity-powered end use technologies that enabled the development of our modern power grid, and that drove much of our economic growth in the 20th century.

In the 21st, century, however, we have a different imperative. Our electricity grid is built; to sustain economic growth while protecting our environment, we must cut waste from the energy-services side of the grid while cutting pollution from the generation side. Last week's lighting coalition announcement is one significant shift among many that must be achieved on the energy services side. Our technology studies and potential analyses show that such shifts toward energy-efficient technology can occur in many other end-uses.

Philips' new lighting initiative is representative of the kinds of innovation we are seeing in the buildings sector. In the industrial sector, companies like Dow Chemical are achieving dramatic gains in energy efficiency and carbon emission reductions. From 1995 to 2005, Dow reduced the energy consumed per pound of product by 20%. In 2006, the company announced a new commitment to reduce its energy used per pound of product by another 25% by 2015. This requires continuous innovation, in end-use technology, in the application of combined heat and power systems, in process improvement, and in operation and maintenance practices.

Program and Policy Initiatives Needed to Realize Efficiency Potential

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. ACEEE 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 equipment efficiency standards and energy-efficiency tax incentives.[21]

EPAct 2005, however, did not address several key energy efficiency issues. And since 2005, America's energy challenges have increased. We therefore recommend that Congress take further action to stimulate energy efficiency innovation.

Energy Market and Technology Data Collection

One of the core functions and responsibilities of the federal government is to collect information on market activity, so that businesses, researchers, and policymakers have the fundamental information they need to understand markets and plan for future initiatives. The Commerce Department, through its Census and other activities, and the Department of Energy, through its Energy Information Administration surveys, are two of the key sources of information needed to keep up with developments in energy markets. We have seen disturbing trends in both agencies,

[21] 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, DC: American Council for an Energy-Efficient Economy.

with key surveys being cut back in comprehensive and in frequency, and in some cases dropped altogether.

We urge the Committee to investigate this issue and seek to restore this key information infrastructure. Cutting back on energy market surveys is like cutting back on the U.S. Geological Survey, on whose information the energy supply industries depend for energy resource information; we need to continue and expand, not curtail, government efforts in this area.

For specific examples, we are concerned about the loss of the M-series surveys in the Census Bureau. These surveys collect essential information on product shipments, without which it is not possible to track the trends that indicate which technologies are penetrating the market. In addition, last year's discontinuation of the Vehicle Inventory and Use Survey was a tremendous disservice to the cause of heavy-duty truck efficiency, and indeed to the understanding of and planning for the trucking industry generally. The VIUS, conducted every five years, is the only source of national data on the number, size, fuel economy and driving patterns of the U.S. truck stock. It should be reinstated as soon as possible, before the Commerce Department's institutional capability disappears. The next VIUS was to have occurred in 2007.

Research, Development, Demonstration, and Deployment (RDD&D)

Many of the energy efficiency technologies we see emerging today were created with federal RDD&D support—these include Energy Star windows, compact fluorescent and LED light bulbs, and high-efficiency refrigerator technology. EPAct authorized significant increases in efficiency RDD&D; however, budget requests for efficiency RDD&D have declined by about one-third since FY 2002. These cuts are beginning to cripple our research infrastructure, by laying off senior personnel with irreplaceable technology expertise and research experience, and in some cases discontinuing entire research programs. If the U.S. wants to continue its record of innovation in the energy area, and wants to be an effective competitor in global markets, Congress needs to rebuild the research infrastructure needed to support technology innovation.

We were encouraged to see the Senate Budget Committee allocate $1.6 billion for energy efficiency and renewable energy programs at the Department of Energy. This represents more than a $300 million, 25% increase over the administration's FY 2008 budget request. In our House Energy and Water Development Appropriations Subcommittee testimony, we recommended increases in 16 priority efficiency programs for a total increase of $217 million above the request. We hope the Senate appropriations process will follow these recommendations, and thus begin to rebuild the RDD&D infrastructure the U.S. needs to get ahead of the curve on the next generation of energy efficiency innovations.

Policies to Save Oil

Most notably missing from EPAct were significant provisions to reduce oil use or to accelerate energy efficiency investment in the electricity and natural gas industries. We recommend that Congress make these high priorities in its upcoming deliberations on energy policy. Fuel economy in the vehicle fleet must be improved, either through federal fuel economy standards, tax incentives, or RD&D policies. Our analysis projects that more than 5 million barrels of oil per day, some 25% of current U.S. consumption, could be saved cost-effectively by 2025.

ACEEE supports the "Ten-in-Ten" fuel economy bill sponsored by several Commerce Committee members that would raise the average fuel economy of light-duty vehicles to 35 mpg by 2018. This target is achievable and necessary to allow the transportation sector to meet its responsibility to address climate and energy security goals.

There are companion policies that should be explored as well. On the consumer side, a feebate policy would ensure, in the face of volatile fuel prices, consistent consumer interest in the fuel economy of the vehicles that they buy and help to align consumer demands with requirements of manufacturers as fuel economy increases are phased in over the next decade.

Energy Efficiency Resource Standards for Utilities

We also recommend that Congress enact Energy Efficiency Resource Standards (EERS) for electric and gas utilities. EERS is a simple policy approach that sets overall performance targets for utility efficiency efforts and provides flexibility in compliance. Several states have implemented EERS, beginning with Texas in its 1999 electricity restructuring legislation.[22] It is somewhat analogous to the Renewable Portfolio Standards (RPS) the Senate has passed twice in this decade. In fact, EERS and RPS are quite complementary. Our preliminary analysis shows that the most recent Senate RPS bill, combined with the EERS in a current discussion draft, could begin to reduce carbon emissions in the U.S. electric power sector by 2020.

EERS laws and regulations are now in operation in several states and countries. Texas's law requires electric utilities to offset 10% of their demand growth through end-use energy efficiency. Utilities in Texas have already exceeded their targets, and there is legislation to raise them. Hawaii and Nevada recently expanded their renewable portfolio standards to include energy efficiency. Connecticut and California have both established energy savings targets for utility energy efficiency programs (Connecticut by law and California by regulation) while Vermont has specific savings goals for the nonprofit organization that runs statewide programs. 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 Italy, the United Kingdom, France, and the Flemish region of Belgium.

Appliance and Equipment Efficiency Standards

Appliance and equipment efficiency standards are another proven policy for accelerating innovation in energy efficiency. Standards already in place will save Americans over $200 billion in net economic benefits through 2030. There are several consensus agreements for new standards that could be included in legislation in this session of Congress. We will work with the energy committees on these issues.

---

[22] Nadel, Steven. 2006. *Energy Efficiency and Resource Standards: Experience and Recommendations*. American Council for an Energy-Efficient Economy, Report No. E063.

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 stakeholders about standards on additional products and has agreements on several new standards. We are working with energy committee staff to include these new consensus standards in legislation this year.

Products which may lend themselves to consensus standards include the following:

- Reflector lamps
- Pool heaters
- Metal halide luminaires
- 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.

Energy Efficiency Tax Incentives

We also recommend that the EPAct tax incentives for energy efficiency technologies be extended beyond their current expiration dates, which were truncated by the EPAct conferees at the last minute. The EXTEND Act (S.822) was recently introduced in the Senate to achieve this end, while also refining some specific provisions. We support the EXTEND Act as part of a consensus among a wide range of stakeholders

While they are not included in the EXTEND Act, Hybrid tax credits in EPAct 2005 should be extended and expanded to ensure the continued growth of the hybrid market. Incentives for heavy-duty hybrids should be revisited and extended as well. Interest in heavy-duty hybrids is high among users, and as is the potential for fuel savings.

Conclusion

Energy efficiency is the "first fuel" for America's energy policy. Energy efficiency has saved consumers and businesses trillions of dollars in the past two decades, but these efforts should be accelerated in order to:

- Wean America from its addiction to oil and so enhance our national security;
- Help American consumers and businesses cope with high energy bills;
- Bring balance to America's energy markets by softening energy prices;
- Strengthen our economy by generating American jobs and capital investment; and
- Start to meet the global warming challenge by moderating carbon dioxide emissions.

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