

Testimony of Kateri Callahan, President Alliance to Save Energy

**Senate Commerce, Science, and Transportation Committee,
Science, Technology, and Innovation Subcommittee
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Policies to Use the Energy Efficiency Resource

Introduction

The Alliance to Save Energy is a bipartisan, nonprofit coalition of more than 120 business, government, environmental and consumer leaders. The Alliance's mission is to promote energy efficiency worldwide to achieve a healthier economy, a cleaner environment, and greater energy security. The Alliance, founded in 1977 by Senators Charles Percy and Hubert Humphrey, currently enjoys the leadership of Senator Mark Pryor as Chairman; Duke Energy CEO Jim Rogers as Co-Chairman; and Senators Jeff Bingaman, Byron Dorgan, and Susan Collins along with Representatives Ralph Hall, Zach Wamp and Ed Markey, as its Vice-Chairs. Attached to this testimony are lists of the Alliance's Board of Directors and its Associate members.

The Alliance is pleased to testify at a hearing on energy efficiency technologies and programs. At the request of committee staff, I will focus on the energy efficiency of buildings, both in direct policies and by encouraging utility energy-efficiency programs, but will also touch on transportation efficiency.

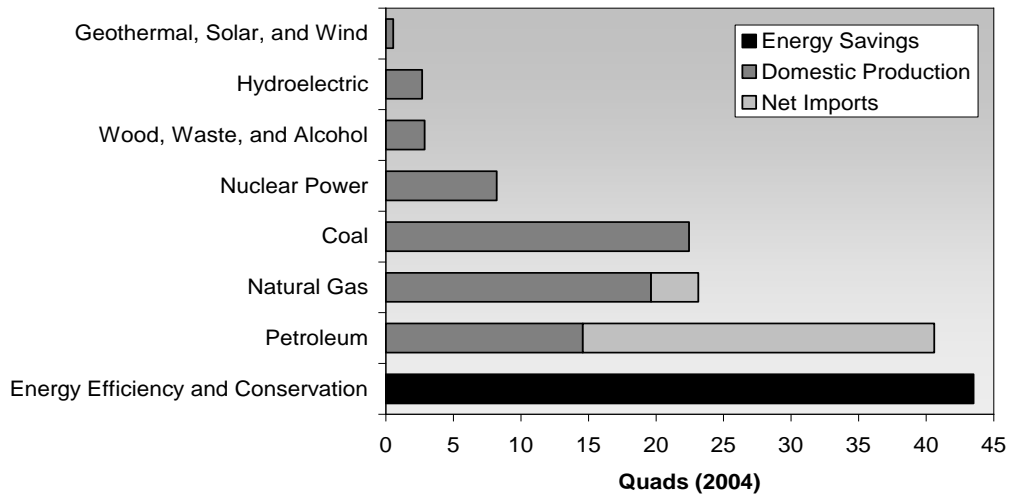
Energy Efficiency: America's Greatest Energy Resource

Natural gas prices have doubled in the last few years, and gasoline and electricity prices also reached all-time highs. Recent energy price increases cost American families and businesses over \$300 billion each year. The president recognized energy security as a major issue in the State of the Union message. And the world's scientists recently reaffirmed the urgent need to reduce global warming. These problems are not going to go away—electricity use in the United States is projected to grow by half by 2030. Such growth will lead to higher prices, greater volatility, and increasing dependence on foreign natural gas as well as foreign oil.

Energy efficiency is the quickest, cheapest, and cleanest way not only to tackle our current energy cost issues, but also to meet the anticipated future growth in energy demand in the United States. The enormous contribution of energy efficiency to meeting our energy needs is achieved with little or no negative impact on our wilderness areas, our air quality, or the global climate. Energy efficiency enhances our national and energy security by lessening requirements for foreign energy sources. Further, energy efficiency is invulnerable to supply disruptions; is rarely subject to siting disputes; is available in all areas in large or small quantities; and generally costs much less than it would to buy additional energy.

Energy efficiency is the nation’s greatest energy resource—efficiency now contributes more than any other single energy resource to meeting our nation’s energy needs, including oil, natural gas, coal, or nuclear power. The Alliance to Save Energy estimates that without the energy efficiency gains since 1973 we would now be using at least 43 quadrillion Btu more energy each year, or 43% of our actual energy use.

Energy Efficiency: America's Greatest Energy Resource



Source: Alliance to Save Energy

Much of these savings resulted from federal energy policies and programs like appliance and motor vehicle standards, research and development, and the Energy Star program. Federal action for energy efficiency has been most effective when it combines four elements to create a cycle of improvement: 1) Support for research and development on new energy efficiency technologies, 2) Incentives and early adoption to create initial markets for the most advanced products and technologies, 3) Public education to spur widespread commercialization of efficient options, and 4) Standards and codes to set an efficiency floor. This testimony will discuss policies in all these areas.

The Potential Impact of Energy Efficiency in Buildings

Building energy use is a major factor in the linked problems of energy prices, energy security, and global warming, and must be a major part of their solution. More than one-third of all energy used in the United States, and more than two-thirds of electricity, goes to heat, cool, and power buildings. Just over half of that is for homes, the rest for a wide variety of commercial buildings.

Great strides have been made in improving the efficiency of appliances, heating and cooling systems, equipment, and the building envelope (walls, windows, doors, and roofs). At the same time the growing size of homes and appliances, and the growth in electronic equipment have overwhelmed the efficiency savings.

An even greater savings potential remains—a recent study by the McKinsey Global Institute found that measures that pay for themselves in ten years would save 36 percent of energy use for homes and 19 percent of energy used for commercial buildings. A 2000 study by several national labs estimated that energy-efficiency policies and programs could cost-effectively reduce U.S. energy use in residential buildings by 20 percent and in commercial buildings by 18 percent over a 20-year span, essentially reversing the growth they projected in building energy use. The American Institute of Architects has called for reducing fossil fuel use in new and renovated buildings by 60 percent by 2010 and by 100 percent by 2030.

A combination of several policies and programs have made a real impact on saving energy in buildings, including appliance standards, building energy codes, labeling programs, tax incentives, and research and development of new technologies—I will talk about some of these later in the testimony. But one of the most effective approaches has been utility energy-efficiency programs, and I will start with these.

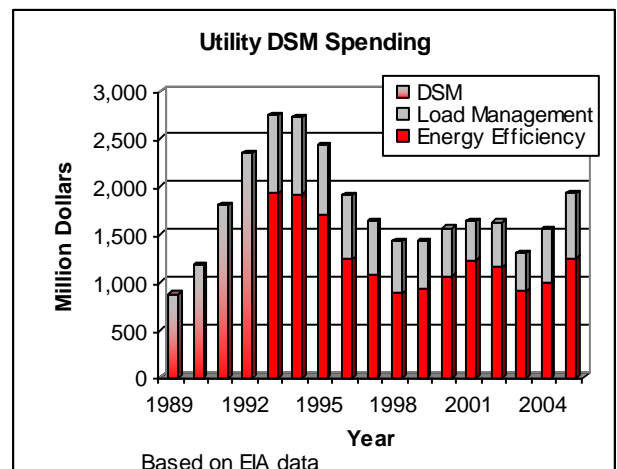
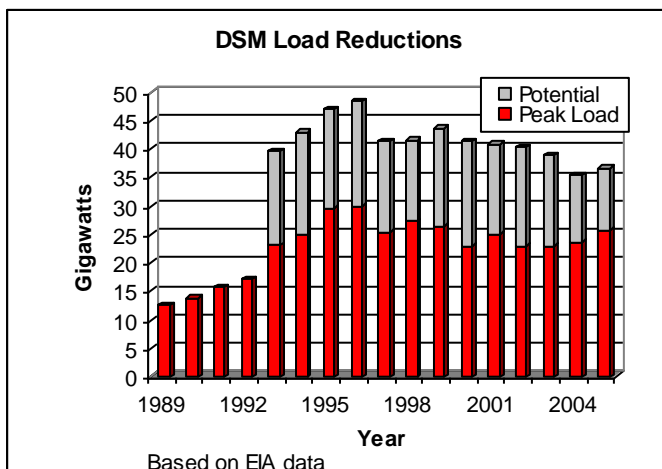
Utility Energy-Efficiency Programs

Why should utilities reduce their sales by helping their customers reduce energy consumption? Many utilities have found that helping their customers to save a kilowatt-hour of electricity is cheaper and easier than generating and delivering that kilowatt-hour. For these utilities and their customers energy efficiency is a key energy resource.

As California found out in 2001, a slight excess of demand for electricity over available supply can cause blackouts, massive price spikes, and economic turmoil. Small increases in demand have doubled retail natural gas prices nationwide over the last few years, resulting in plant shutdowns and home foreclosures. Energy-efficiency programs are the cheapest, quickest, and cleanest way to respond to these challenges. In California in 2001 an aggressive campaign reduced peak electricity demand by 10% in less than one year, and thus helped avoid further shortages.

These demand-side management (DSM) programs use measures such as rebates for efficient appliances, commercial lighting retrofits, and energy audits to help their customers use less energy. The cost to the utility for the energy savings is often around 2-4 cents per kilowatt-hour (kWh), much less than the cost of generating and delivering electricity. Such efficiency investments save consumers money, increase consumer comfort, reduce air pollution and global warming, enhance economic competitiveness, and promote energy reliability and security.

Over the last two decades, states worked with regulated utilities to avoid the need for about one hundred 300-Megawatt (MW) power plants. However, utility spending on DSM programs



nationwide was cut almost in half as the electricity industry was partially deregulated in the late 1990's. In the last couple years there has been a resurgence of interest in electricity and natural gas energy-efficiency programs, with new programs in states such as Georgia and Arkansas, and added funding in leaders like California and Vermont. Some states have also chosen to run similar demand reduction programs themselves.

Utility Sector Energy-Efficiency Policies

Recommendation: Fund the Energy Efficiency Pilot Program authorized in Section 140 of the Energy Policy Act of 2005, and require states to consider adopting policies to promote utility energy-efficiency programs.

Several major new reports have focused in part on the need for new policies to promote utility energy-efficiency programs, including:

- The *National Action Plan for Energy Efficiency* brought together more than 50 organizations, led by the Edison Electric Institute and the National Association of Regulatory Utility Commissioners (NARUC). They seek “to create a sustainable, aggressive national commitment to energy efficiency through gas and electric utilities, utility regulators, and partner organizations.”
- The Western Governors’ Association Clean and Diversified Energy Initiative set an ambitious goal of a 20 percent increase in energy efficiency by 2020 in the West; the *Energy Efficiency Task Force Report* examines how to achieve it.
- The U.S. Environmental Protection Agency’s *Clean Energy-Environment Guide to Action* details many policies and practices states are adopting to manage their energy needs and air quality.
- The Department of Energy, in consultation with NARUC and the National Association of State Energy Officials, as well as the Alliance, issued a report on state and regional policies that promote utility energy-efficiency programs under section 139 of the Energy Policy Act of 2005.

Together these reports set forth policies needed to help utilities create effective energy-efficiency programs. These policies include:

Adopt energy efficiency goals, requirements, or commitments, with reporting on progress and oversight. For example, California conducted a study of the potential savings from cost-effective energy-efficiency programs in the state, set targets for each of its regulated electric and natural gas utilities, required each utility to submit plans to meet those targets, and approved \$2 billion in funding for the planned programs over three years.

Use energy efficiency as a priority resource when planning to meet customer needs. As utilities in some regions plan to build the first new generating plants and transmission lines in years, they are showing more interest in alternatives. For example, Georgia Power in its most recent

Integrated Resource Planning (IRP) process agreed to initiate the first energy-efficiency programs in a decade.

Provide robust and stable program funding. Funds can be provided as part of utility rates or through a small surcharge on utility bills (a public benefits fund or system benefits charge). For example, Wisconsin recently increased its public benefit fund and protected it from raids to pay for state deficits.

Set rates to incentivize utilities and customers. Typically utilities earn more by selling more energy. It is important to “decouple” utility revenues from sales, or to provide utilities with performance incentives for effective energy-efficiency programs, in order to align utility benefits with customer benefits. For example, Northwest Natural, a natural gas utility in Oregon, has a “conservation tariff” that helps it promote energy savings rather than sales.

Carefully evaluate energy-efficiency programs, with measurement and verification of energy savings and appropriate cost-effectiveness tests, so all stakeholders can rely on the energy savings. For example, in Texas savings estimates used to meet the state peak load reduction requirements are verified by a contractor to the Public Utility Commission of Texas.

These policies are typically set at a state level, by public utility commissions or sometimes by state legislatures. However, as there are compelling national interests that cannot easily be addressed by individual states, federal action is needed. While most individual states are not large enough to affect the shortage of natural gas that has driven up prices, concerted federal action could have an impact. In addition, the grid failures that blackened much of the Midwest and Northeast in 2003 showed that reliability issues are not confined within state lines.

As a focus for federal policy, the energy efficiency resource has several advantages:

- It is readily available in all parts of the nation,
- It is available for direct natural gas use as well as for electricity,
- It is cost-effective today, and
- The potential savings are enormous.

The Senate recognized the potential of utility energy-efficiency programs, and the need for a federal role, in its 2005 energy bill. In addition to the required report in Section 139, Section 140 authorized \$5 million a year for five years to create state pilot programs designed to achieve 0.75% annual reductions in electricity and natural gas use. In the Senate version of the bill, Section 141 would have required state public utility commissions to consider policies to promote utility energy-efficiency programs. The Alliance urges appropriation of funds to implement Section 140, which was enacted, and thanks the Senate for including funds in its appropriations bill last year. We also strongly support enactment of Section 141. But we believe more concerted federal action is needed.

Energy Efficiency Resource Standard

Recommendation: Enact a federal energy efficiency resource standard for electric and natural gas utility energy-efficiency programs, coordinated with any renewable electricity standard.

Several states are already developing innovative policies to set performance standards for utility energy-efficiency programs alongside standards for generation from renewable sources.

Like a renewable electricity standard (RES), an energy efficiency resource standard (EERS) is a flexible performance-based and market-based regulatory mechanism to promote use of cost-effective energy efficiency as an energy resource. An EERS requires utilities to implement energy-efficiency programs sufficient to save a specified amount of electricity or natural gas, such as 0.75 percent of the previous year's sales. Note that an EERS is not a requirement that the utility's sales decrease in absolute terms or a limit on its sales at all; it is a performance requirement for the utility's energy-efficiency programs.

An EERS gives utilities broad flexibility about how and where to achieve the energy savings. Utilities can meet an EERS through the kinds of effective demand reduction programs that have been conducted in many states for years. They also may be able to use customer combined heat and power, and energy loss reductions in the distribution system. They can implement their own programs, hire energy service companies or other contractors, or sometimes pay other utilities to achieve the savings by buying credits. The program savings are independently verified.

Usually, the costs of the energy-efficiency programs must be recovered from energy customers through utility rates, but the savings from avoided energy supply are greater than the efficiency cost. It is important for states to set rates in a way that utilities are not financially penalized for reduced sales due to effective energy-efficiency programs

According to the American Council for an Energy-Efficient Economy, a national 0.75% EERS would by 2020:

- Save 386 billion kWh of electricity (8 percent of total use) and 3600 billion cubic feet of natural gas (14%) each year
- Reduce peak electric demand by 124,000 MW (avoiding about 400 power plants),
- Save consumers \$64 billion (net after investments), and
- Prevent 320 million metric tons of carbon dioxide greenhouse gas emissions each year.

An EERS and an RES may be used in combination. Renewable and efficiency requirements reinforce each other in several ways in the states:

- *Texas* has separate renewable and efficiency requirements. The efficiency targets focus on peak demand—utilities are required to avoid 10% of the expected increase in electric peak demand through efficiency programs. They have easily exceeded these targets.
- *Connecticut* added to its RES a separate tier under which utilities are to save 1 percent of electricity use each year through residential and commercial programs and combined heat and power. *Pennsylvania* includes energy efficiency with certain other resources in one tier of its alternative energy portfolio standards.
- *Hawaii* and *Nevada* added efficiency resources as options in their portfolio standards—with higher overall targets—after utilities claimed to have difficulty meeting renewable targets (Nevada caps the amount efficiency can contribute).

- *California* has a “loading order” that sets efficiency as the preferred resource; once cost-effective efficiency measures have been exhausted, utilities are to use renewable sources, and only then traditional sources. The PUC sets targets for utility energy-efficiency programs based on a study of their potential savings.

A national EERS should build on these examples and on state regulatory expertise but ensure that energy efficiency meets national goals.

Appliance Energy-Efficiency Standards

Recommendations for appliance efficiency standards: Strengthen appliance efficiency standards by:

- 1) adopting additional standards based on negotiated agreements,*
- 2) directing DOE regularly to review and update both test methods and standards to keep pace with rapidly changing technology, with accelerated consideration of the products with the greatest energy savings,*
- 3) clarifying DOE’s authority to set standards that best serve the public interest, including regional standards and multiple specifications for a single product,*
- 4) clarifying that federal preemption does not apply to products for which there is no federal standard, and*
- 5) providing adequate and stable funding for the DOE program.*

Appliance standards have been one of the most effective energy-efficiency programs. Standards in place today are expected to save 7 percent of U.S. electricity use and reduce greenhouse gas emissions by 65 million metric tons by 2010, and are expected to save consumers \$234 billion (this is *net* savings—after repaying any increased first-cost for more efficient appliances). Energy efficiency advocates and states have identified at least 15 appliance types with significant energy savings opportunities but no federal efficiency standards at present. Adopting efficiency standards for these 15 products alone could save 52 TWh of electricity and 340 billion cubic feet of natural gas annually by 2020, and save consumers \$54 billion in energy costs between now and 2030. Even more could be saved by updating existing federal standards.

In recent years the Alliance and other energy-efficiency advocates have focused much of our attention on lengthy delays and lack of progress at DOE in setting required appliance standards. Due to a provision in EPAAct 2005—and a lawsuit—last year DOE set an explicit schedule for appliance standard rulemakings, which was later adopted in a court order. So far, they have met that schedule. However, the two new DOE-proposed standards (on distribution transformers and residential furnaces) were far weaker than we and many others believe is required by federal law, justified by DOE’s own data and analysis, and needed in order to meet the energy needs of our nation.

We urge you to monitor carefully both DOE’s adherence to its regulatory schedule and the actual outcome of the rulemaking process. In addition, Congress should take additional steps to strengthen the federal appliance standards and testing program and assure that it is adequately funded.

First, since EAct 2005 we have reached additional consensus agreements with product manufacturers on new and updated standards. DOE believes it does not have the authority to adopt one of them, for residential boilers. In addition, efficiency advocates and industry groups are currently in negotiations on several other products. We urge Congress to act promptly to enact into law all negotiated agreements that are reached.

Second, at present, there is no requirement for DOE regularly to review and update all existing standards and test procedures. The existing law does require a limited number of reviews for some products, but subsequent reviews are discretionary. In addition, Congress should establish a general requirement for periodic review of all standards and test procedures every 5 to 8 years, updating them if justified, and should provide funding for DOE to maintain this schedule. In particular, DOE test methods for a number of products are seriously lagging the pace of technology development, thus preventing effective standards for those products (examples include tankless water heaters, products that use standby power even when turned “off,” and many appliances with advanced electronic controls). If DOE fails to keep its standards up-to-date, Congress should allow states to set standards to limit the demands on their energy systems from those products.

In addition, DOE has limited its schedule for setting appliance standards to congressionally mandated rulemakings with a date certain. This narrow approach has delayed consideration of some standards with the greatest potential energy savings. For example, DOE has identified furnace fans and residential refrigerators as two product standards that offer the potential for very large energy savings, but the agency has yet to even schedule these rulemakings. Congress should direct DOE to begin these two important rulemakings as soon as possible.

Third, Congress should allow DOE to consider alternative approaches in setting appliance standards where these better serve the intent of the law: to maximize cost-effective energy savings. We offer several examples:

- Congress should explicitly authorize DOE to set regionally-appropriate appliance standards for climate-sensitive products such as furnaces, boilers, air conditioners, and heat pumps, since regional weather conditions can significantly affect the feasibility or cost-effectiveness of a given technology or efficiency measure. For example, “condensing” furnaces can cut energy losses in half, but may not be cost-effective in warm areas where they are seldom used. A regional furnace standard would save large amounts of natural gas.
- Congress should clarify that DOE may include two or more specifications for different features of the product that all contribute to energy efficiency. One example is the authority for DOE to set standards for air conditioners in terms of both average efficiency, which reduces consumer bills, and performance during the hottest summer days, which provides added benefit by easing the strain on electric utility systems during peak demand periods. A second example is the ability to set efficiency requirements for both direct electricity use and consumption of (heated) water in the case of a dishwasher or clothes washer.
- In addition, expedited procedures for consideration of consensus standards proposed to DOE may speed up adoption of non-controversial standards.

Finally, Congress should make it clear that federal law does not preempt states from setting their own appliance standards in the absence of a federal standard in place. This principle has generally been upheld in interpretation of the federal appliance standards laws, but in some cases it has been argued that the mere authority for DOE to set standards should preempt the states, even if DOE fails to exercise that authority. If DOE fails to act, or if it establishes a “no standard” federal standard, a state should be able to adopt its own energy-saving standards for that product.

Building Energy Codes

One of the most important opportunities for reducing energy use and costs is by designing and constructing a new building to be energy-efficient from the start. Every new building that is not efficient represents a lost opportunity—one that will likely be with us for another 30-50 years or longer, a time frame that will almost certainly see much higher prices and much more intense concern over energy supplies, air pollution, and greenhouse gas emissions.

There is cause for optimism in the growing interest shown by builders and developers in green buildings and rating systems such as the U.S. Green Building Council’s LEED; the bold new policy commitments to energy efficiency targets by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the American Institute of Architects, and the U.S. Conference of Mayors; and the federal government’s own commitment (in EPAct 2005) to design new federal buildings to be 30% more efficient than current practice. But a great deal of work remains to be done. Congress can support and encourage these broader initiatives with specific actions that take best advantage of federal leverage in building codes and federal financing for home mortgages.

Recommendations for assisting state energy-efficient building codes:

- 1) *Congress should direct DOE to support a process of continuous improvement in the model energy codes for both residential and commercial buildings, targeting a 30 percent reduction in new building energy use by 2010 and a 50 percent savings by 2020. States should be required to adopt codes that match these energy savings and to achieve high rates of compliance with their codes.*
- 2) *To make sure that energy codes are not just a paper exercise, Congress should fully fund the programs for state code compliance and training authorized in Section 128 of the Energy Policy Act of 2005.*

Under present law independent organizations (the International Code Council and ASHRAE) set national model residential and commercial building energy codes. DOE reviews updates in the model building codes to determine if the revisions improve energy efficiency. Following that determination, each state is required to review and, for commercial buildings, update its own building code to meet or exceed the model code. However, there is no penalty for a state that fails to comply.

Two changes are needed. First, DOE should set a goal for continuous improvement of the model building codes. Rather than wait passively for action by others, DOE should instead take the initiative to engage with organizations including ASHRAE and the International Code Council to advance the model codes steadily toward specific targets: 30 percent efficiency improvement by

2010, for both residential and commercial model codes, and at least 50 percent improvement by 2020. ASHRAE has already adopted a similar goal, but there is no similar urgency for residential buildings, and it is hard to move diverse, consensus-based organizations to take ambitious action. DOE support is needed both for technical underpinnings and to represent the national interest in reduced energy use and greenhouse gas emissions. If the outside organizations fail to achieve these goals, then DOE should propose modified codes that do.

Second, we need to encourage state action to update and achieve full compliance with the energy codes. States should be required to adopt strong codes for residential as well as commercial buildings. And they should be required to achieve strong compliance with their codes. In a recent review of residential energy code compliance studies from a dozen states, compliance rates were found to vary widely, but the average was far below 100 percent, and typically closer to 40 to 60 percent. A number of studies have pointed to the constraints, including staff time and expertise, facing many local code enforcement agencies in making sure that energy code requirements are met, both at the design and permit stage, and in verifying actual construction and installation practices on-site.

Congressional oversight would be helpful here as well. The code compliance program authorized under Section 128 of EPCA 2005 is a small but important step toward providing an incentive for states to adopt and enforce up-to-date energy codes; it should be fully funded. In addition, DOE has not made the required determination of energy savings on any recent code updates: the 2003, 2004, or 2006 residential IECC or the 2001 or 2004 ASHRAE commercial standard.

Recommendations for federal standards for manufactured homes and buildings funded by the federal government:

- 1) *Congress should require HUD to strengthen the national energy efficiency standards for manufactured housing to the same levels required by the model building code for site-built homes.*
- 2) *Congress should require that federally insured mortgages be available for new homes only if the homes meet or exceed model energy efficiency codes.*
- 3) *Congress should require that all new DoD Privatized Military Housing be designed to meet or exceed the criteria for an Energy Star home.*

About one in 12 new homes in the United States is a manufactured housing unit (147 million in 2005). Because these homes are factory-produced with many standardized components, manufactured housing units should be inherently more energy-efficient than their site-built counterparts. For example, it is much easier and more cost-effective to achieve an air-tight duct system in the factory than on a construction site. Instead, manufactured homes are generally much less efficient than site-built homes, due to poorly insulated walls and roof, single-pane windows, and inefficient heating and cooling systems. A 2004 Pacific Northwest National Laboratory report found that improving the energy efficiency of a manufactured home, not even to the current IECC, would save an average of \$150-\$180 per year. The initial cost would be about \$1000 to \$1500.

The Department of Housing and Urban Development, which is responsible for adopting the Manufactured Housing Construction and Safety Standards (MHCSS), has not updated these standards to keep up with changing energy prices and technological advances. As a result, the “HUD-code” standards are now well below the comparable energy efficiency code requirements for new site-built homes. For example, a new manufactured home built for Minnesota today is required to have only as much wall insulation—and not as much ceiling and floor insulation—as a site-built home in Miami.

Many of these manufactured units are sold to low and moderate income families – those who can least afford to pay the rising utility bills for gas, electricity, and in some cases propane heating. And often taxpayers end up subsidizing the ongoing costs to operate these inefficient housing units through the Low-Income Home Energy Assistance Program (LIHEAP) or through the Low-Income Weatherization Assistance Program, which helps pay for energy-saving retrofits. It is far easier and cheaper to make these manufactured homes more efficient in the first place.

To qualify for a federally insured mortgage, a new home should be required to meet or exceed the efficiency levels of the model energy code. This will assure that federal taxpayer funds are not used to underwrite inefficient new homes with higher utility bills – a different kind of hidden, long-term “mortgage.” Updated standards would affect a lot of housing: a 2003 U.S. Census Bureau survey found, for homes constructed in the previous four years, 486,000 FHA mortgages, 225,000 VA mortgages, 29,000 USDA mortgages, and 38,000 public housing units.

Current law requires HUD and the Department of Agriculture (USDA) to set energy-efficiency standards for public and assisted housing and new homes (other than manufactured homes) with federally insured mortgages. However, the agencies have never changed the standard from the legislated backstop of the 1992 Model Energy Code (the predecessor to the IECC) and ASHRAE Standard 90.1-1989.

In order to move military service members and their families out of outdated housing units, Congress authorized the Department of Defense (DoD) to enter financial partnerships with builders to construct an estimated 185,000 homes using joint funding. DoD is leasing the homes for up to 50 years, and will pay the energy bills through utility allowances to the military personnel. DoD imposes many standards on these units, and energy efficiency criteria are established for some projects, but there are no uniform energy standards applied to all Privatized Housing projects. If these homes are built to Energy Star Homes criteria, each military family—and ultimately the federal taxpayers—will save an average of \$300 a year in energy bills. The added initial cost of Energy Star homes is about \$1,500 to \$3,000.

Buildings Research, Development, and Deployment

Recommendation for a buildings RD&D program: Establish and fund a long-term program to develop and establish in the market net-zero energy commercial buildings.

To create the technology and knowledge base needed to achieve the long-term goal of net-zero energy (and “carbon-neutral”) buildings, the federal government needs to make a major commitment—in close partnership with states, utilities, and the private sector—to a comprehensive, multi-year program to transform building technologies and practices. This

transformation must go well beyond individual technical measures to include a design process that integrates sustainability from the start, and effective means of managing construction and building operation to assure continued high performance over the lifetime of the building and systems.

The need is especially acute in the commercial buildings sector, where the challenge of maintaining performance, comfort, occupant health, and amenities while radically reducing energy consumption without significantly increasing costs is even greater than for smaller residential buildings. Yet “net-zero energy homes” rather than commercial buildings have received the lion’s share of funding and program attention to date by DOE, utility and state programs, and private partnerships.

Investing 1/10 of one percent of the \$135 billion in annual energy costs for all U.S. commercial buildings would represent a substantial increase over the current federal efforts by DOE and all other agencies. But this is the equivalent of less than 12 hours of energy costs for the nation’s commercial building stock—a reasonable price to assure that we really have the technologies and practices to cut energy use by more than half over the next two decades. To be effective, these funds would need to be directed toward a well-orchestrated plan to address *innovation* in technology and practices, strategic and well-monitored *demonstrations* of these new methods, and paths to effective large-scale *deployment* in new and existing commercial buildings.

Such an integrated strategy requires careful preparation and broad engagement of the building industry, the design professions, financial institutions, government policy-makers, and private owners and developers. There is growing interest in sustainable design but the industry is fragmented, risk averse, and driven largely by short term economic interests. By itself the federal government cannot create the needed technologies, nor force the market to accept them. But it can and should be the catalyst in partnering with industry, states, and utilities for these essential steps.

Increasing Energy Efficiency in Federal Facilities

Recommendations for federal energy management:

- 1) *Establish a procedure to implement all cost-effective efficiency improvements in large federal buildings*
- 2) *Increase oversight and funding, and modify authority for Energy Savings Performance Contracts*

The United States federal government is the single largest consumer, and the single largest waster, of energy in the world. In 2005 the federal government overall used 1.6 quadrillion Btu of “primary” energy (including the fuel used to make the electricity it consumed), or 1.6 percent of total energy use in the United States. Taxpayers in this country paid \$14.5 billion for that energy. Almost half of that energy, and more than half of the cost, was for vehicles and equipment, primarily for military planes, ships, and land vehicles. The rest, 0.9 quadrillion Btu at a cost of \$5.6 billion, was for heating, cooling, and powering more than 500,000 federal buildings around the country.

Repeated efforts over the last two decades have resulted in dramatic energy and cost savings, but large cost-effective savings remain available. Overall federal primary energy use decreased by 13 percent from 1985 to 2005, and the federal energy bill decreased by 25 percent in real terms, even after the 27 percent jump in fuel prices in the United States in 2005. Congress and the president have set even more aggressive targets for future savings that could yield well over \$1 billion in energy cost savings each year from federal buildings alone.

But these savings will not occur without greater funding and oversight. In addition to greater appropriations, the Alliance supports a new focus on energy efficiency throughout federal buildings and increased use of Energy Savings Performance Contracts (ESPCs) and Utility Energy Service Contracts (UESCs). The Alliance believes that a new paradigm and a new structure are needed to ensure that all large federal buildings are made energy-efficient, that improvements are not made just when appropriations happen to be available or an energy manager happens to be a champion of efficiency. Thus we recommend a package of policies that have been introduced in a new bill by Senator Pryor, S. 1434:

- All large federal buildings and facilities should conduct comprehensive energy and water savings evaluations (“energy audits”) to identify and prioritize all economic opportunities for investments to reduce energy and water use. These evaluations should consider both capital investments, such as a new boiler or chiller, and operational improvements, such as checking and adjusting lighting or mechanical system controls.
- Agencies should implement all measures identified in the energy and water evaluations that have a simple payback of fifteen years or less. The calculation of cost savings should consider not only energy and water costs but also reduced costs of building operations, maintenance, repair, and equipment replacement.
- It is critical that the agencies not only make the capital investments but also make sure that the measures work, and keep on working. Start-up commissioning, and periodic recommissioning, are an essential part of all measures to ensure that they work as intended—followed by effective operation, maintenance, and repair as well as measurement and evaluation of savings.
- Sustained oversight is needed to ensure that every agency is implementing these measures. While congressional action is important, the first level of oversight should be agency self-certification through an open web-based tracking system, along with benchmarking of building energy and water use, and reviews in the agency energy scorecards that the Office of Management and Budget already prepares.
- Both the energy-savings evaluations and the measures themselves should be funded through a combination of increased appropriations and private financing through ESPCs and UESCs.

The Alliance also supports additional modifications to ESPC authority to remove a number of arbitrary impediments. First, the authority for federal agencies to enter into ESPCs should be permanently extended, to avoid the problems that have occurred with the lapse of authority in 2003-2004. Second, energy managers should be able to use appropriated funds and financing

through ESPCs to fund the same project. Third, Congress should end any self-imposed agency caps on the duration of ESPC contracts below the statutory limit of 25 years and on total obligations under ESPCs.

Energy Efficiency Tax Incentives

Recommendations for energy-efficiency tax incentives:

- 1) Provide long-term extensions, with improvements, of tax incentives for highly efficient new homes, home improvements, commercial buildings, appliances, and vehicles.*
- 2) Enact a vehicle fuel use “feebate,” with incentives for fuel-efficient vehicles paid for by a fee for gas guzzlers, to reduce fuel use in all vehicles.*

The Energy Policy Act of 2005 (EPA 2005) included important tax incentives for highly energy-efficient new homes, improvements to existing homes, commercial buildings, heating and cooling equipment, appliances, fuel cells, and hybrid and advanced diesel vehicles. These incentives for consumers and businesses have the potential to help transform markets to embrace energy-efficient technologies and thus to help the best buildings, vehicles, and equipment become mainstream.

Unfortunately, most of the EPA 2005 incentives were not put in place for a long enough period of time to ensure market transformation. Most of the incentives were limited to two years -- expiring on December 31, 2007. And, while two of the incentives – for commercial buildings and new homes—were extended for one year and so now are set to expire at the end of 2008, this is still not adequate to ensure a meaningful impact on the market. A large commercial building initiated when the bill was signed in August 2005 will not be finished before the commercial buildings deduction was set to expire in December 2007. A building initiated now could not be finished before the new expiration date in 2008. In order for these tax incentives to be effective in creating a market transformation toward greater energy efficiency and reductions in energy use they need to be given more time to work. Lifting or increasing the caps on the incentives for hybrid vehicles is equally important.

The Alliance also supports a new, performance-based tax credit for whole home retrofits that save energy, included in the EXTEND Act, which we thank the Chairman for cosponsoring. The credit is on a sliding scale based on percentage energy savings, starting with homes that are certified as saving 20% of energy use. This new approach should encourage much greater energy savings by helping homeowners find the best measures for their homes and subsequently ensuring that the savings are realized from the improvements made. The new credit will require an inspection and certification of the energy savings in order to establish the level of credit to be received.

And the Alliance supports a more comprehensive approach to incentivizing more fuel-efficient vehicles. A new, innovative approach to encouraging efficiency of light-duty cars and trucks is a national “feebate” system. A national feebate would apply a fee or rebate to new vehicles based on the expected lifetime fuel use of the vehicle. We would recommend that the fee and rebate apply to manufacturers of all light-duty passenger vehicles—including SUVs and minivans—but they could be determined relative to vehicles in the same class or to vehicles of the same size.

The fee or rebate would then be proportional to the fuel economy, determined relative to a dividing line or reference mpg.

We would recommend setting this dividing line between fees and rebates each year such that the total fees would pay for all the rebates thereby allowing the program to operate at no cost to the government. Under such an arrangement, about half the vehicles would receive a rebate, and about half the vehicles would be assessed a fee.

This would create an incentive for manufacturers to use fuel-efficient technologies in the vehicles they produce, and hence should increase the availability of efficient vehicles, as well as creating an incentive for consumers to purchase more efficient vehicles. As fuel economies increased, the reference mpg's would be ratcheted up, creating an incentive for continual improvement, but never out of line with the existing market. This policy has the potential to improve fuel economies throughout the passenger vehicle fleet, not just give new technologies a foothold in the marketplace.

Transportation

Given that the transportation sector accounts for two-thirds of U.S. oil use and that passenger cars and light trucks consume 40 percent of that oil, it is critical that we address vehicle fuel consumption. There is no shortage of technologies to improve vehicle fuel efficiency. Many of these technologies are already in vehicles, including electronic controls and ignition, light weight materials, improved engine designs. Other technologies are now being pulled off "the shelf" and increasingly deployed in new vehicles. They include (for example):

- Variable Cylinder Management – turns off cylinders when not in use.
- Advanced Drag Reduction – further reduces vehicle air resistance.
- Variable Valve Timing and Lift – optimizes the timing of air intake into the cylinder with the spark ignition.
- Reductions in Engine Friction – using more efficient designs, bearings and coatings that reduce resistance between moving parts.
- Hybrid Drive Trains – internal combustion engine combined with electric motor and regenerative braking.

While advanced technologies have been, and continue to be, deployed in new cars and trucks, we're not getting more miles per gallon (mpg) as a result. We are getting more towing capacity, more acceleration, more weight, and more space.

For the last 20 years, the nation's oil policy has in effect been made in America's car showrooms. It is time for the federal government to provide more guidance in the vehicle marketplace. I have already discussed the idea of a vehicle fuel use "feebate." But the most important single policy would be a strong increase in Corporate Average Fuel Economy Standards.

Between 1975 and 1985, fuel economy standards were used to help achieve a 70% improvement in new vehicle fuel economy. But since the mid-1980s, CAFE standards have been largely unchanged. Worse, old testing methods, a loophole for "trucks", and credit for "dual-fuel"

vehicles that almost always run on gasoline have further weakened existing CAFE standards. EIA estimates that the actual fuel economy of vehicles is about 20 percent lower than the CAFE standard test results suggest. If we are to address the interconnected issues of gas prices, oil imports, and climate change, we need to reform and significantly increase CAFE standards in order to direct our technological ingenuity to saving fuel.

Conclusion

The Energy Policy Act of 2005 included some important measures to reduce building energy use, including new appliance standards and tax incentives. But, while helpful, they were not aggressive enough to address the critical energy issues facing our nation. In the last year and a half, concern about the linked issues of energy prices, energy security, and global warming has only grown. There are measures we could and should take, such as consumer education, that would have an immediate impact. But polls also show that a large majority of Americans are rightly more concerned that Congress find long-term energy solutions than that Congress quickly address current prices. There is an opportunity now to enact significant energy-efficiency measures that will benefit the economy, the environment, and energy security for years to come. The buildings being designed and constructed today will determine our energy use for decades to come. The Alliance urges you to seize the opportunity to reduce energy waste, supply shortages, price volatility, pollution, and global warming, to transform energy crises into economic opportunities.