ACEEE Testimony

American Council for an Energy-Efficient Economy

Submission of Steven Nadel,
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To the House Energy and Commerce Committee

Subcommittee on Energy and Power
Subcommittee on Oversight and Investigations

Hearing on:
Smart Energy Act

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SUMMARY

Energy efficiency is a key part of an "all of the above" energy strategy. Energy efficiency has reduced U.S. energy use by about half since 1970 and much more is possible. Energy efficiency is typically less expensive per unit of energy than most energy supplies, and energy efficiency is more labor intensive, helping to create more jobs. Unfortunately, a series of market barriers keeps investments in energy efficiency below optimal levels. Smart policies can help address some of these market barriers, helping the private market to better capture these efficiency opportunities.

The Smart Energy Act is a useful piece of legislation to increase energy efficiency in the United States. Provisions will foster energy efficiency investments in federal facilities by private companies, reduce energy use for data processing, and increase use of combined heat and power systems. These will be important contributors to reducing energy waste in the United States.

However, significantly more can be done. We recommend that the Committee look at adding some additional provisions, particularly ones related to improving model building codes, training building engineers, encouraging efficiency upgrades to existing buildings and modernization of manufacturing facilities, and making consensus improvements to equipment efficiency standards. A recent analysis ACEEE prepared on the impacts of such provisions found that such a bill would reduce U.S. energy consumption in 2030 by 2.3 quadrillion Btu, about 2 percent of projected energy use that year, while creating about 185,000 jobs by 2030.

INTRODUCTION

My name is Steven Nadel and I am the Executive Director of the American Council for an Energy-Efficient Economy (ACEEE), a nonprofit organization dedicated to increasing energy efficiency to promote both economic prosperity and environmental protection. We were formed in 1980 by energy researchers and celebrated our 30th anniversary in 2010. Personally I have been involved in energy efficiency issues since the late-1970s and have testified multiple times before this Committee and its Subcommittees as well as before the Senate Energy and Natural Resources Committee,

ACEEE is a nonpartisan organization. Today I appear as a Democratic witness but during the development of the *Energy Policy Act of 2005* I appeared several times as a Republican witness. In our view, energy efficiency is a quintessentially nonpartisan issue. This is illustrated by the Smart Energy Act that is before us today. We thank Representatives Bass and Matheson for introducing this bill and hope the Energy and Power Subcommittee and the full Committee will report it out favorably.

In my testimony I wish to make two primary points:

1. Energy efficiency is a key energy resource for the United States, with costs generally lower than other resources and with a larger macroeconomic multiplier effect. Unfortunately, the United States is now lagging behind many leading

countries in energy efficiency, which increases waste and the cost of American goods and services. If we are to fully compete with other countries, we need to be more efficient.

2. The Smart Energy Act is a start, but significantly more can be done. We make some recommendations and summarize a recent analysis ACEEE prepared on the impacts of a bill with these features.

I would also like to make a brief comment about loan guarantees and suggest an alternative approach.

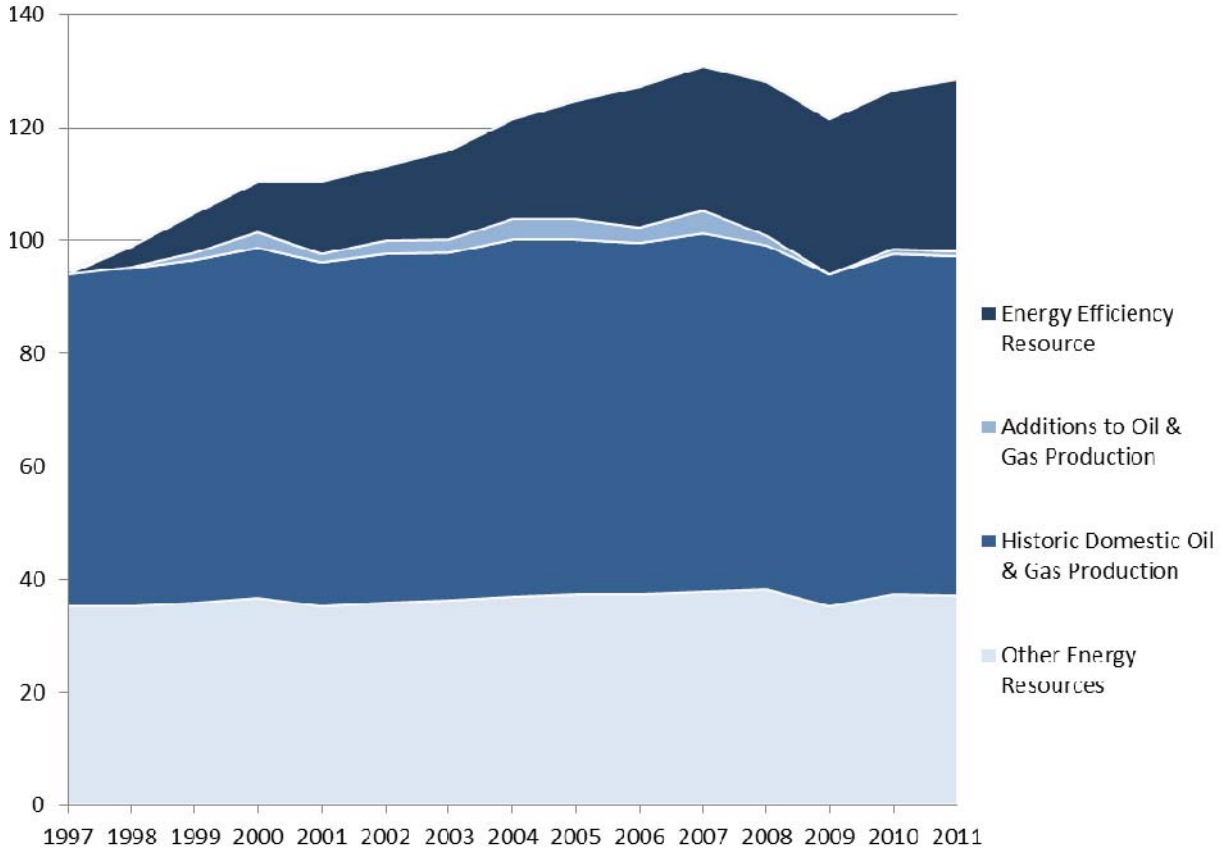
ENERGY EFFICIENCY IS A KEY RESOURCE

Energy efficiency improvement has contributed a great deal to our nation's economic growth and increased standard of living over the past 40 years. Energy efficiency improvements since 1970 accounted for approximately 100 quadrillion Btu in 2010, which is *about as much energy as we consume each year and more than the energy we get annually from domestic coal, natural gas, and oil sources combined.*[1] Thus, energy efficiency ran rightfully be called our country's largest energy source. Since 1970, energy use per dollar of GDP has declined 53 percent. If the United States had not dramatically reduced its energy intensity over the past 40 years, consumers and businesses would have spent about $1.2 billion more on energy purchases in 2009.[2]

More recently, there has been much attention on the expansion of oil and gas production in the United States due to hydraulic fracturing and other new techniques. While these gains are notable and useful, energy efficiency gains have been much larger. As shown in Figure 1, since 1997 when modern hydraulic fracturing began,[3] the contribution of energy efficiency towards our energy mix has been much larger than post-1997 additions to domestic oil and gas production. Hydraulic fracturing and other advanced techniques have also helped to maintain historic levels of domestic oil and gas production, but even if this production is added to the "additions" wedge in the chart, energy efficiency gains since 1997 would still be substantially larger than the contribution from advanced oil and gas resources.[4]

[1] See Figure 1 in Laitner et al. 2012. *The Long-Term Energy Efficiency Potential.* American Council for an Energy-Efficient Economy. http://www.aceee.org/research-report/e121.
[2] Derived by ACEEE from EIA's *Annual Energy Review 2011,* Table 1.5. 2010 expenditures were not included yet.
[3] Parshall. 2008. "Barnett Shale Showcases Tight Gas Development." *Journal of Petroleum Technology.* September. .http://www.spe.org/jpt/print/archives/2008/09/JPT2008_09_12BarnettShaleREV.pdf .
[4] According to data in the EIA's *Annual Energy Outlook 2012*, "tight oil" represented about 10 percent of U.S. oil production in 2011 while shale gas represented about 30 percent of U.S. natural gas production in 2011.

Figure 1. U.S. Energy Resources 1997–2011



Source: Data from EIA except for energy efficiency, which was derived by ACEEE from EIA data on energy use per dollar of GDP.

Even though the United States is much more energy efficient today than it was 40 years ago, there is still enormous potential for additional cost-effective energy savings. A 2009 study by McKinsey and Company found that widespread pursuit of comprehensive energy efficiency efforts:

> would yield gross energy savings worth more than $1.2 trillion, well above the $520 billion needed through 2020 for upfront investment in efficiency measures (not including program costs). Such a program is estimated to reduce end-use energy consumption in 2020 by 9.1 quadrillion BTUs, roughly 23 percent of projected demand, potentially abating up to 1.1 gigatons of greenhouse gases annually.[5]

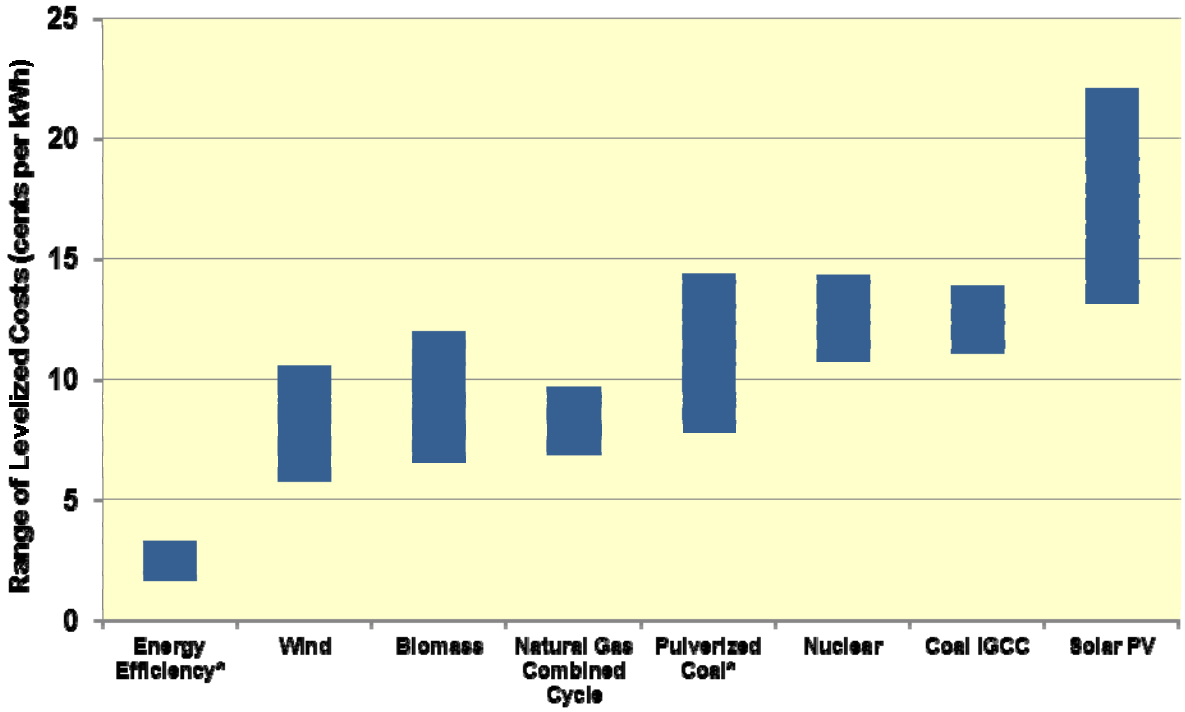
Looking farther into the future, a January 2012 study by ACEEE found that by 2050, energy efficiency measures and practices could reduce U.S. energy use by 42-59 percent relative to current projections, and in the process save consumers and

[5] McKinsey & Company. 2009. *Unlocking Energy Efficiency in the US Economy*.

businesses billions of dollars, raise gross domestic product in 2050 by $100-200 billion, and support 1.3-1.9 million jobs in 2050.[6]

Energy efficiency investments have a variety of important economic benefits. For example, energy efficiency tends to be less expensive than most energy supply resources. Figure 2 compares the cost to the utility of energy efficiency investments and new power supply investments.

Figure 2. Levelized Cost per kWh for Different Electricity Resources

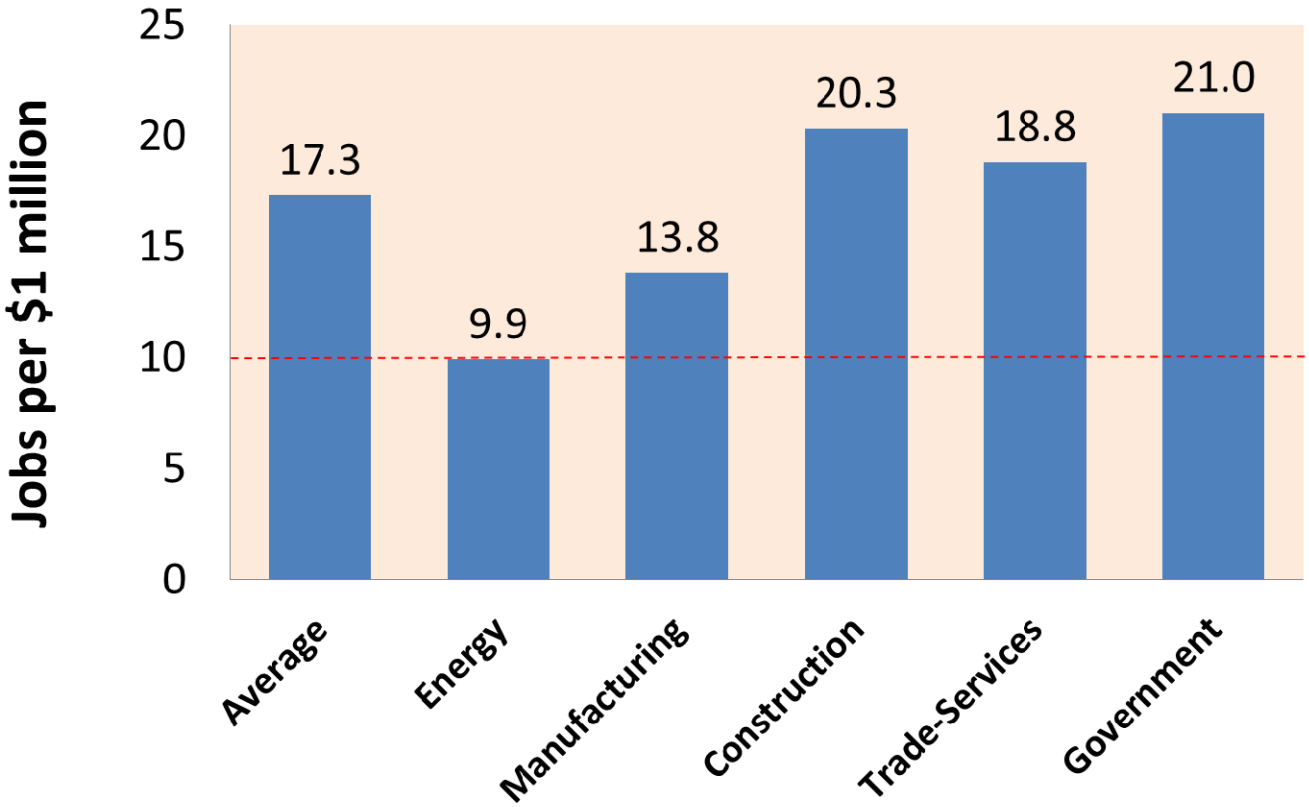


*Notes: Energy efficiency average program portfolio data from Friedrich et al. 2009 (ACEEE); All other data from Lazard 2011. High-end range of advanced pulverized coal includes 90% carbon capture and compression.

Likewise, energy efficiency tends to be very labor-intensive, helping to create jobs. First, jobs are created designing, manufacturing, and installing efficiency measures. Second, as consumers and businesses save on their energy bills, they respend the savings, generating additional jobs. Figure 3 shows how more jobs are generated per dollar invested in construction and services (where most of the energy efficiency jobs are) than in the energy sector (which is capital but not labor intensive).

[6] Laitner et al. 2012. *The Long-Term Energy Efficiency Potential.* American Council for an Energy-Efficient Economy. http://www.aceee.org/research-report/e121.

Figure 3. Jobs per Million Dollars of Revenue by Key Sectors of the U.S. Economy



Source: ACEEE. *How Does Energy Efficiency Create Jobs*. http://www.aceee.org/fact-sheet/ee-job-creation.

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 is not time to research energy-saving options); and bundling of energy-saving features with high-cost extra "bells and whistles."

Today, ACEEE is releasing its first *International Energy Efficiency Scorecard*, which compares the United States with eleven of the other largest economies in the world. I will provide the results at the hearing, but in these written comments I can note that the U.S. is far from number one. Many of our trade competitors are making much more progress on energy efficiency than we are, reducing their energy waste and energy costs and helping to make their goods and services more competitive. It is time for the U.S. to "up our game" to better compete in world markets.

THE SMART ENERGY ACT IS A GOOD START BUT SHOULD BE STRENGTHENED

The Smart Energy Act recognizes that energy efficiency is an important part of an "all of the above" energy strategy. The Smart Energy Act contains some useful provisions that:

- Recognize the importance of Energy Saving Performance Contracts for reducing federal energy use, leveraging capital from the private sector and paying off this capital with the energy bill savings that result.
- Reduce energy use for data processing equipment by consolidating federal data centers and encouraging use of personal computer power-saving techniques by federal agencies.
- Set a goal of doubling the amount of electricity from combined heat and power systems and developing and implementing a strategic plan for achieving this goal.
- Require a study on ways to reduce barriers to the deployment of industrial energy efficiency.

However, while this bill contains useful provisions, much more can and should be done. We recommend that the bill be strengthened by adding several provisions:

1. **Support for Model and State Building Codes.** National model building codes are developed by the International Code Council (ICC) and the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE). DOE provides technical assistance to these bodies and also assists states who are considering adopting these codes. We recommend that DOE set energy saving goals for model codes and expand its work to encourage and assist states to adopt and successfully implement these codes.

2. **Building Training and Assessment Centers.** Presently DOE has a very successful program to help train new energy efficiency engineers by working with university professors and their students to conduct energy audits of small to medium-sized manufacturing facilities. The students gain practical work experience and the manufacturers get a low-cost energy audit. Given this training, participating students usually receive multiple job offers upon graduation. We recommend that this program be expanded to include training of building engineers and not just industrial engineers.

3. **Loan Program for Energy Efficiency Upgrades to Existing Buildings.** Current law is unclear on whether energy efficiency retrofits qualify under the current section 1703 and 1705 credit support programs. We recommend that these sections be clarified to include energy efficiency. Also, as discussed further near the end of my testimony, we recommend that these programs be converted from loan guarantees to a loan loss reserve in order to rely more on the private market and limit federal exposure to bad loans.

4. **State Partnership Industrial Energy Efficiency Revolving Loan Program.** Many manufacturing plants are old and in need of modernization to help maintain their ability to compete internationally. As part of modernization, the energy efficiency of these plants can and should be improved. While very large firms can find the capital for such modernization on their own, smaller firms may have problems obtaining capital or may be forced to pay high interest rates. We recommend that Congress establish a revolving loan fund to aid modernization of manufacturing plants. Such a fund could be administered by states with a requirement that states match federal funding dollar for dollar. Loans can be made at the Treasury Note rate plus appropriate fees for administration and a loan-loss reserve. As loans are repaid, the principal can be loaned again.

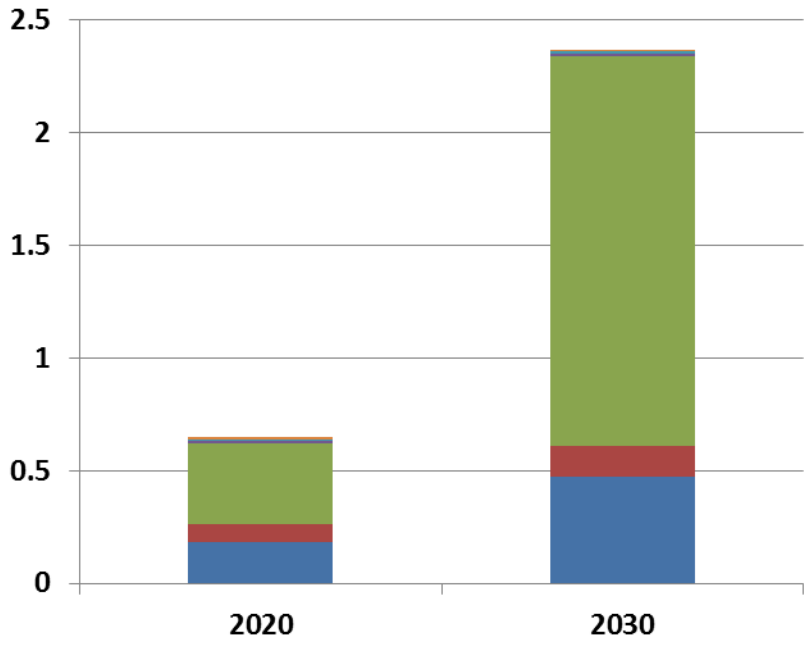
5. **Consensus Improvements to Equipment Efficiency Standards.** Over the past five years since the last major energy bill was enacted, a variety of improvements to the existing federal equipment efficiency standards program have received consensus endorsement from manufacturers, trade associations, utilities, states and energy efficiency organizations. These include technical corrections to previous bills, correcting unforeseen consequences from previous bills (e.g., the provisions of H.R. 5710 by Mr. Westmoreland and S. 920 by Senator Blunt), clarifying portions of existing law that are unclear, and adopting several new national consensus standards in order to replace a patchwork of state standards.

In May 2012, ACEEE published an analysis of the costs and benefits of a bill with provisions similar to those in Smart Energy Act plus the additional provisions I recommend. We found that such a bill would reduce U.S. energy consumption in 2030 by 2.3 quadrillion Btu, about 2 percent of projected energy use that year, which in turn would drive annual consumer energy savings of about $23 billion in 2030. Furthermore, such a bill would create about 102,000 jobs by 2020 and about 185,000 jobs by 2030.[7]

As part of our analysis, we examined the energy savings of individual provisions, as summarized in Figure 4. Most of the energy savings are provided by three provisions – those addressing building codes, industrial revolving loans, and equipment standards (labeled "INCAAA" in the figure[8]).

[7] Farley et al. 2012. *Impacts of Energy Efficiency Provisions in Pending Senate Energy Efficiency Bills.* American Council for an Energy-Efficient Economy. http://www.aceee.org/white-paper/shaheen-portman.
[8] INCAAA is the Implementation of National Consensus Appliance Agreements Act, a bipartisan provision developed by staff for Senators Bingaman and Murkowski.

Figure 42: Primary Energy Savings in Quads by Provision Analyzed



	BTAC	**<0.01**	**<0.01**
	Building Finance	**0.02**	**0.01**
	Transformers	**<0.01**	**<0.01**
	Building Codes	**0.36**	**1.73**
	Industrial Revolving Loans	**0.08**	**0.14**
	INCAAA	**0.18**	**0.47**
	Total	**0.65**	**2.34**

Source: Farley et al. 2012. See Footnote 7.

LOAN GUARANTEES VERSUS LOAN LOSS RESERVES

A final issue I wish to raise is the issue of loan guarantees versus other incentives for finance. Many concerns have been expressed about loan guarantees for renewable energy ventures over the past few years. It is important to note that similar guarantees have been offered for nuclear and advanced conventional energy resources as well. As the recent defaults on some of these loans have shown, when a loan guarantee goes bad, the federal government can be faced with the full cost of the loan.

A less costly alternative, which helps spread the risk, is to establish a loan loss reserve that covers defaults only up to a certain amount, say 10 percent of the loan pool. Beyond that, the private sector and not the federal government would need to deal with losses. Loan loss reserves reduce risk but do not eliminate it. By reducing risk, lower interest rates can be obtained, but not as low as when the federal government assumes all of the risk. For future programs, we recommend that Congress consider use of loan loss reserves in lieu of loan guarantees.

CONCLUSION

Energy efficiency is a key part of an "all of the above" energy strategy. Energy efficiency has reduced U.S. energy use by about half since 1970 and much more is possible. Energy efficiency is typically less expensive per unit of energy than most energy resources, and energy efficiency is more labor intensive, helping to create more jobs. Unfortunately, a series of market barriers keep investments in energy efficiency below optimal levels. Smart policies can help address some of these market barriers, helping the private market to better capture these efficiency opportunities.

The *Smart Energy Act* is a useful piece of legislation to increase energy efficiency in the United States. Provisions will aid energy efficiency investments in federal facilities by private companies, reduce energy use for data processing, and increase use of combined heat and power systems. However, significantly more can be done. We recommend that the House Energy and Commerce Committee consider incorporating additional provisions into the Smart Energy Act, as recommended in this testimony, and then favorably report the bill out of committee.

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