

## Testimony before the House Energy and Commerce Committee, Subcommittee on Energy and Power

“21<sup>st</sup> Century Energy Workforce Development Jobs Initiative Act of 2014”

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Chairman Whitfield, Ranking Member Rush, Members of the Committee,

Thank you for the opportunity to speak to you today about the need for workforce development and training in energy and related industries.

My name is Jim Barrett, I am the Chief Economist at the American Council for an Energy-Efficient Economy (commonly known as ACEEE). ACEEE is a non-profit research institute dedicated to advancing energy efficiency. For over 30 years, we have been a trusted source of information on end-use energy efficiency technologies and policies.

I am here to talk to you about the training and workforce development needs for the energy efficiency industry. First, just to make sure we are all talking about the same thing, I'll spend a moment defining energy efficiency. Though often conflated with energy conservation, efficiency is distinct. It's not about turning down the thermostat and putting on a sweater, or otherwise doing without. Instead, efficiency is about doing more with less: Going further on a gallon of gasoline, keeping your home warm while using less fuel, using precision timing to produce high quality products while cutting costs.

Unlike other energy sources, you can't touch, smell, or see energy efficiency. You can't burn it or put it on the electric grid. That makes efficiency a bit different than other energy sources. However, the important thing to keep in mind about energy is that no one really consumes energy for its own sake. We don't buy gasoline because we like gasoline. We buy it because we need to go places and our cars use gasoline to take us there. We don't eat electricity, but we need it to store and prepare food. We don't consume energy per se, rather we consume energy *services*: mobility and access, heating and cooling, the ability to use our computers for work and televisions to relax. So while efficiency doesn't deliver energy, it delivers energy services, and it's just as important to the economy as physical energy sources are, perhaps more so.

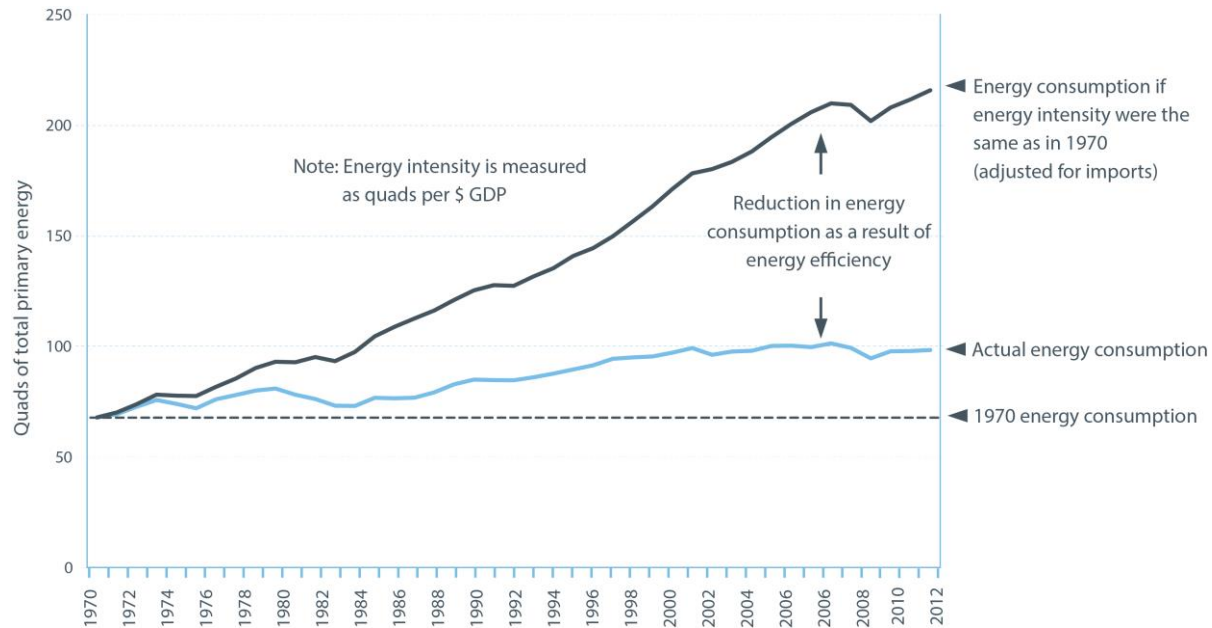
In 1970, US GDP, the value of all the goods and services we produce, was a little over \$5 trillion in today's terms. By 2012, that had more than tripled to over \$16 trillion, adjusting for inflation.<sup>1</sup> In 1970, our economy consumed about 68 Quadrillion BTU's worth of physical energy. By 2012 that grew to just under 100, an increase not of 300%, like GDP, but of only 41%. If we consumed energy in 2012 the same way that we consumed it in 1970, we would have consumed over 220 Quadrillion BTU's. What this means is that over that timeframe, the majority of the increase in demand for energy was not met by increasing the supply of energy, but rather by energy efficiency, as shown in Figure 1 below. Without energy efficiency, energy consumption

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<sup>1</sup>Inflation and GDP data from the Bureau of Economic Analysis at: <http://www.bea.gov/national/xls/gdplev.xls>

would be more than twice as high as it is today. By that measure, efficiency has been the single most important “fuel” of the past 40 years.

**Figure 1: Energy Consumption, GDP Growth, and Efficiency 1970-2012**



Not only is energy efficiency a critical resource for economic growth and productivity, it is an important source of employment. Unfortunately, just as efficiency itself can't be seen, the energy efficiency “industry” is also difficult to identify. Unlike industries such as oil and gas extraction, electricity generation, or automobile manufacturing, there is no clearly delineated efficiency sector. Though difficult to identify and measure, energy efficiency “production” and energy efficiency jobs are spread throughout the economy. In the manufacturing sector, energy efficiency plays an important role in developing new, lower cost and more efficient appliances, cars that get better gas mileage, and in improving industrial processes that allow us to make more of these and other products with less energy than ever. Investing resources in making homes and offices more energy-efficient creates jobs in construction and the industries that make the equipment and materials needed for the job.

As a simple measure, every \$1 million spent on energy as a whole supports about 4 full time jobs directly and through the supply chain. Investing that same amount of money in the construction sector to make homes and offices more efficient would support about 12 jobs, not even taking into account the beneficial impacts of increased productivity, reduced pollution, and increased competitiveness. An analysis ACEEE performed of the *Energy Savings & Industrial Competitiveness Act of 2013* found that the investments in efficiency that bill would drive would support a net increase of over 100,000 jobs per year in addition to the jobs that energy efficiency investments already create.<sup>2</sup>

<sup>2</sup> Rachel Young, et. al. (2013) “Economic Impacts of the Energy Efficiency Provisions in the Energy Savings & Industrial Competitiveness Act of 2013 and Select Amendments.” American Council for an Energy-Efficient Environment. ACEEE: Washington, DC.

In addition, the EPA's Clean Power Plan to reduce carbon emissions from existing power plants focuses heavily on using end-use energy efficiency as a way to achieve reductions in carbon emissions. ACEEE conducted an analysis in advance of the rule's announcement to estimate the impacts of efficiency policies we thought were likely to be included in the rule. Our analysis indicates that by 2030 the rule could induce over \$625 billion of investment in various energy efficiency industries and behaviors, and create an average of over 400,000 jobs per year both directly and throughout the economy.<sup>3</sup>

As we continue to draw on energy efficiency important part of the U.S. energy industry and the economic future, the education, skills, and training needed to take advantage of the investments to come are growing and changing. In order to continue to invent new technologies, improve existing ones, develop new materials and new processes, our workforce needs an understanding of a wide range of scientific and engineering concepts. Not only does this speak to an increasing need for technically trained students coming out of colleges, universities, and community colleges, but also for STEM education starting with a strong foundation as early as elementary and high school. On top of this foundation, workers will need education and training in applied sciences in higher education. Where there are opportunities to improve the way we use current technologies to get the most out of them, workers will need training on how to recognize and take advantage of such opportunities. A relatively new area of energy efficiency opportunities we call "intelligent efficiency" combines efficiency, computing, and information technologies in industrial settings, all of which require well-educated and trained workers. Finally, to design, build, and upgrade our homes and offices for increased efficiency, workers in construction trades will need be up to speed on the latest techniques, equipment, and products that go into more advanced buildings.

We expect increasing growth in all of these areas with a wide range of training and educational needs. Community colleges and union-based training programs in particular can play a central role in providing hands-on vocational and practical training in a number of skilled and semi-skilled occupations directly related to energy and energy efficiency.

I am not an expert on designing training programs, though I have had the opportunity to tour skilled training programs in plumbing, pipefitting, heating, air-conditioning, and related systems with an eye on increased energy efficiency. To the extent that people imagine these occupations to be simple or "un-skilled," I can say that they are wrong. In many cases, to do this work right requires highly specialized skills, and well-designed targeted training programs, neither of which happen by accident. I will leave it to those with more knowledge and expertise to discuss how to deliver that training to traditionally underserved communities, but I will state what seems obvious that participation in these and other growing energy industries requires participation in appropriate training and education programs. To the extent that the existing workforce is not representative of our working-age population as a whole, that disparity is likely to persist absent

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<sup>3</sup> Sara Hayes, et. al. (2014) "Change Is in the Air: How States Can Harness Energy Efficiency to Strengthen the Economy and Reduce Pollution." American Council for an Energy-Efficient Economy. ACEEE: Washington, DC.

focused efforts such as those proposed in the 21<sup>st</sup> Century Energy Workforce Development Jobs Initiative Act of 2014 we are discussing today.

Thank you again for the opportunity to speak today, and I am more than happy to answer any questions you may have.