

Business Council for Sustainable Energy

Testimony Submitted to the Senate Energy and Natural Resources Committee

Hearing on Energy Efficiency

April 30, 2015

The Business Council for Sustainable Energy appreciates and welcomes the committee's consideration of policy measures to improve and enhance energy efficiency.

The Council is a broad-based industry trade group representing companies and associations in the energy efficiency, natural gas and renewable energy industries. Its membership includes independent electric power producers, investor-owned utilities, public power, commercial end-users, equipment manufacturers, project developers as well as service providers for energy and environmental markets. Since 1992, the Council has been a leading industry voice advocating for policies at the state, national and international levels that increase the use of commercially-available clean energy technologies, products and services.

The Council would like to share some of the findings from the 2015 edition of the *Sustainable Energy in America Factbook*.¹ The *Factbook* was researched and produced by Bloomberg New Energy Finance and commissioned by the Business Council for Sustainable Energy. It is a quantitative and objective report, intended to be a resource for policymakers with up to date, accurate market information. Its goal is to offer important benchmarks on the contributions that sustainable energy technologies are making in the United States energy system today. It also provides information on finance and investment trends in clean energy resources.

Sustainable Energy in America Factbook Findings

The *Sustainable Energy in America Factbook* points to the dramatic changes underway in the United States energy sector over the past several years. Traditional energy sources are declining, while natural gas, renewable energy, and energy efficiency are playing a larger role.

These changes are increasing the diversity of the country's energy mix, improving our energy security, cutting energy waste, increasing our energy productivity and reducing air pollution and greenhouse gas emissions.

Behind this change are a portfolio of new energy innovations, technologies, and applications. These include: newly applied techniques for extracting natural gas from shale rock formations; lower-cost and higher-efficiency photovoltaic panels for converting sunlight to electrons; highly efficient, natural gas end-use applications; natural gas vehicles and battery and fuel cell electric vehicles; and 'smart meters' that allow consumers to monitor, modulate, and cut electricity consumption, among others.

The *Factbook* looks at a broad spectrum of sustainable energy technologies and provides data on a wide range of clean energy industries including natural gas, renewable energy sources (including solar, wind, hydropower, geothermal, biomass, biogas and waste to energy – but excluding liquid biofuels), stationary fuel cells and other distributed technologies, as well as energy efficiency.

The *Factbook* shows that United States economy is becoming more energy productive and less energy intensive. By one measure—United States gross domestic product (GDP) per unit of energy consumed—productivity has increased by 54% since 1990. Between 2007 and 2014, total energy use fell 2.4%, while GDP grew 8%. This was driven largely by advances in energy efficiency in the transportation, power generation and buildings sectors.

¹ 2015 edition of the *Sustainable Energy in America 2013 Factbook*, February 2015, <http://www.bcse.org/sustainableenergyfactbook>

BETWEEN 2007 AND 2014:

- Total energy use fell 2.4%, while GDP grew 8%.
- Energy productivity of the U.S. economy has increased 11%, and 1.4% from 2013 to 2014.
- Annualized electricity demand growth has been zero.

ENERGY EFFICIENCY TRENDS

- Energy efficiency investment in the U.S. totaled close to 14 billion in 2013, based on spending by utilities and through energy savings performance contracts.
- In 2014, buildings in 10 states adopted more-stringent residential and commercial building codes.
- In 2014, 8% of U.S. generating capacity comes from combined heat and power (CHP) plants (83 GW).
- Commercial and industrial sector appetite for CHP remained the same, approximately 700 MW per year since 2009.
- Smart meters have been deployed to 39% of electricity customers.
- Investments into transmission and distribution infrastructure totaled a record-high \$37.7 billion in 2013 (by investor-owned utilities and standalone transmission companies).
- Demand response accounts for 34 GW of capacity across the U.S.
- The Pacific and New England regions made the greatest strides in energy efficiency. The southeast and southwest regions, meanwhile, have the greatest opportunities to increase efficiency.
- As a trend across the U.S., commercial buildings have showed the greatest progress on energy efficiency over the last several years.
- Uptake of key energy efficiency policies is slowing. States' adoption of decoupling legislation and energy efficiency resource standards (EERS) has been mostly flat since 2010 (with some exceptions), and some states have even begun to retreat from these policies.
- Tightening fuel economy standards are pushing carmakers to release more efficient vehicles; these standards will demand a doubling in fuel economy by 2025.
- Gasoline consumption is down by 8.6% since 2005, largely due to increasing vehicle efficiency prompted by federal policy, increasing consumer preference for less thirsty vehicles on the road, declining miles per vehicle), and increased biofuels blending.
- Sales of battery and plug-in hybrid electric vehicles increased 25% (through 2014 Q3), comprising just less than 1% of market share for new vehicle sales.
- The commercial and industrial sector is demonstrating a continued appetite for CHP (about 700 megawatts (MW) per year since 2009) as well as interest in microgrids.

While energy demand has fallen more steeply than it has in at least 50 years, the use of natural gas and renewable energy has increased. Natural gas provided the United States with 28% of its total energy supply in 2014, and renewable energy is supplying 9.7% of U.S. energy. Natural gas-fired power plants provided 27% of U.S. electricity in 2014, up from just 22% in 2007. Renewable energy generation has meanwhile grown from 8.3% to 12.9% between 2007 and 2014.

Regional Energy Efficiency Comparisons

The regions seeing the greatest measurable strides in energy efficiency are New England and the Pacific states; and the buildings seeing the most energy efficiency efforts are commercial structures. In contrast, the regions that offer the greatest untapped opportunities are the Southeast and Southwest of the country, and the building types that present new opportunities include small office buildings, warehouses, and storage facilities. This comparison of leaders and laggards is based on metrics presented in the *Factbook*, such as: state-wide utility efficiency savings as a percentage of retail sales, state-by-state scorecards for energy efficiency policies, Energy Star-certified floor space for different types of buildings, and investment flows by type of framework. Energy efficiency investment in the U.S. through formal frameworks (mostly, investments by utilities and investments under energy savings performance contracts) totaled an

estimated \$14bn in 2013. Advances in technology and policies to increase the efficiency of appliances and buildings have played a role in reducing emissions and increasing the economy's energy productivity. On the policy front, for example, through 2014, 6.0bn square feet of commercial floor space (around 7% of total US commercial sector floor space) was covered under energy efficiency benchmarking or disclosure policies.

Energy Efficiency Policy Measures Provide Exceptional Value for American Consumers

Policy measures have helped further the cause of energy efficiency. The Department of Energy's efficiency programs have resulted in exceptional value for American consumers and businesses, yielding benefits far beyond their nominal outlays. These programs have retrofitted over 450,000 homes in 43 states, dramatically improved the efficiency of household appliances such as refrigerators and clothes washers, and improved the quality of commercial and residential buildings across the country.²

On February 7, 2013, the Commission on National Energy Efficiency Policy, convened by the Alliance to Save Energy released at its Energy 2030 vision. The Commission's report includes a goal of doubling energy productivity in the United States by 2030 and a set of recommendations to achieve this goal, which includes continued support of energy productivity RD&D. Achieving the goal could save \$327 billion annually and add 1.3 million jobs.³

The Commission noted that private R&D budgets are limited in many energy efficiency sectors. Market barriers also prevent adoption and commercialization of new innovations. Thus government support both for R&D and for a wide range of deployment programs has been critical to advances in energy productivity. Looking forward, the Commission recommends increased federal investment in basic and applied research, development, demonstration, deployment, and technical assistance at DOE, the Environmental Protection Agency, and other federal agencies. The federal government should also encourage private R&D through other policy approaches such as public-private consortia, the R&D tax credit, and supporting challenges or contests.

Building envelope assemblies including, insulating materials and air-sealing system technologies are essential to improving building efficiency. To enable mass market adoption, these next-generation technologies must maintain or improve building enclosure durability, including moisture, fire, indoor air quality, acoustic and structural performance requirements. In the case of retrofitting existing buildings, the installation must be fast and easy so that there is minimal impact on building occupants. BCSE believes DOE should focus additional efforts to accelerate, and improve, building energy performance.

Information and Communications Technology Infrastructure Enhances Energy Efficiency

In an increasingly complex energy system, Information and Communications Technology (ICT) can be used to improve the reliability, resiliency and efficiency of the grid's transmission, storage and distribution infrastructure, and to help reduce pollutant emissions through better real time monitoring and control of grid systems. Further ICT applications to enhance end-use energy efficiency and facilitate demand response strengthen grid efficiency and reliability by reducing peak load stresses and line losses and by allowing better grid management in case of generation outages or transmission anomalies.

In the past, transmission, storage and delivery in the energy grid historically was a relatively straightforward, linear system of generation to transmission to distribution. Dispatching was generally local and based on marginal cost considerations. Margins of safety were large because of limited real-time information and limited options for replacement of power generation sources in an emergency.

² Alliance to Save Energy at <http://www.ase.org/advocacy/immediate-action-needed-defend-federal-energy-efficiency-programs>

³ *Energy2030: Doubling U.S. Energy Productivity by 2030*, <http://ase.org/programs/ee-commission>

Today's grid must adapt to emerging challenges and opportunities – fluctuating energy prices, an increasingly transactive role for customers, integration of distributed energy resources, the need for improved resilience, and the need to reduce greenhouse gas emissions. In order to meet these challenges, a vastly increased role for ICT is essential. Without continually enhanced ICT in the TS&D infrastructure, the grid cannot achieve these 21st century goals. ICT will allow real-time monitoring of actual conditions throughout the system, and provide the ability to control TS&D system functions so as to maximize efficiencies and ensure reliability with less additional costly excess capacity.

Studies have shown grid-related investment in ICT provides enormous benefits for energy efficiency, economic growth and maximum use of non-polluting energy sources.

Energy Efficient Lighting Saves Taxpayers and Consumers Money

Light emitting diode – or LED – bulbs use 75 percent less energy than the old incandescent light bulbs and last up to 25 years. Using LED bulbs on streets and highways, and in our homes, can save taxpayers and consumers a significant amount of money.

For example, LED bulbs, can cut a city's outdoor lighting bill by half or more. Given that most municipalities are strapped for funds, shifting to energy-saving LED light bulbs helps local governments cut operating expenses.

DOE has led the effort in the transformation to more efficient lighting through demonstration projects to validate the effectiveness of outdoor LED lights and to develop procurement guidelines for interested communities and businesses. LED lights are directional light sources so well-designed fixtures can point the light exactly where the light is needed, while also preventing light from going where it's not wanted, such as in the sky or a neighboring property.

Today, less than 5 percent of outdoor lighting fixtures use LEDs bulbs so the savings potential is significant. DOE has estimated that a total shift to LED outdoor lights would save more than \$6 billion and prevent 40 million metric tons of carbon dioxide emissions per year. The upfront cost for LED bulbs is quickly paid back and represents a great investment toward lower bills and reduced air pollution for years to come.⁴

The Role of Federal Facilities and Energy Saving Performance Contracts

As the nation's single largest energy consumer, the Federal government spends more than \$7 billion annually on facility energy costs. Energy efficiency improvements can reduce this expenditure as well as help agencies acquire necessary infrastructure and equipment. In 2007, the Energy Independence and Security Act required federal agencies to perform energy audits of their facilities. With only half of the buildings audited in 2013, approximately \$9 billion worth of energy conservation measures with a ten year payback or less had been identified. There is clearly a vast opportunity for energy efficiency across the Federal government at a time of reduced discretionary funding.

ESPCs and Utility Energy Service Contracts (UESCs) can fill this funding gap. For over 20 years, performance-based contracts for energy savings have provided critical upgrades to federal buildings, including the House and Senate Office Buildings and the U.S. Capitol. Under ESPCs and UESCs, private-sector Energy Service Companies finance and install new energy efficient equipment at no upfront cost to the federal government. Federal agencies repay this investment over time with funds saved on utility costs.

In May 2014 President Obama issued a memorandum extending a target that had been set at the end of 2011 (\$2bn worth of contracts entered in the period 2012-13; target was extended to \$4bn over the period 2012-16).

⁴ <http://energy.gov/eere/ssl/led-lighting-facts>

S. 858, the Energy Savings through Public-Private Partnerships Act, introduced by Senators Gardner, Coons, and Portman, would help ensure that federal agencies are utilizing to the fullest extent possible all cost-effective measures for energy conservation. Identical legislation has been introduced in the House (HR 1629) and was incorporated into the Energy and Commerce Committee's discussion draft of an energy efficiency title for its comprehensive energy bill. Last spring, the Energy Savings through Public-Private Partnerships Act of 2014 was approved by the Energy and Commerce Committee. BCSE encourages Congress to enact these provisions in the 114th Congress.

This legislation would promote transparency and accountability across the federal government, clarify the ESPC statute, and would further enable federal agencies to maximize their present energy efficiency contracting authorities. The legislation would streamline the ESPC statute providing consistency and clarification within the existing ESPC law to:

- Require a report to Congress on the status of each agencies' energy-related performance contracts, the value of these contracts for the previous year, the goal for the coming year, and an explanation by agency about why goals were or were not met.
- For projects discovered in the energy audits required by section 432 of EISA 2007, agencies must explain why any life cycle cost effective measures were not implemented using DOE developed guidelines. This will encourage agencies to act on their mandated audits.
- Clarify that agencies cannot arbitrarily limit use of energy-related operations and maintenance savings in an ESPC, a provision that will facilitate use of ESPCs for data center consolidation.
- Make consistent the definition of a federal building within federal energy provisions of law.
- Clarify in federal energy statute that plug loads are allowable energy conservation measures, another provision to clarify use of ESPCs for data centers.
- Clarify as energy savings the use, sale or transfer of energy incentives, rebates, or credits (including Renewable Energy Credits) from federal, state, local governments or utilities and any revenue generated from a reduction in energy use; more efficient waste recycling; or more energy generated from more efficient equipment.

Conclusion

The *Sustainable Energy in America Factbook* shows the dramatic changes underway in the United States energy sector. The Council appreciates and welcomes congressional consideration of policy measures to improve and enhance energy efficiency and looks forward to commenting further as the committee addresses energy legislation. For further information, please contact Ruth McCormick, Director, Federal and State Affairs, at rmccormick@bcse.org or visit the Council's website at www.bcse.org.