



July 1, 2016

The Honorable Ernest Moniz  
Secretary, United States Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585

Dear Secretary Moniz:

On behalf of the Business Council for Sustainable Energy (BCSE), I am pleased to submit the enclosed comments on the second phase of the Quadrennial Energy Review (QER). The Council is a coalition of companies, trade associations and stakeholders from the energy efficiency, natural gas and renewable energy sectors. It also includes independent electric power producers, investor-owned utilities, public power, commercial end-users and environmental and energy market service providers. Founded in 1992, the Council advocates for policies at the state, national and international levels that increase the use of commercially-available clean energy technologies, products and services. The coalition's diverse business membership is united around the revitalization of the economy and the creation of a secure and sustainable U.S. energy system.

The Council commends the Administration for undertaking this effort to look at the nation's electricity system. The BCSE comments focus largely on the changing generation mix in the United States, integration of renewable energy technologies, and tools for creating a reliable and resilient grid.

The Council looks forward to continuing to work with the Administration on the Quadrennial Energy Review process going forward. For questions about this submission, please contact: Ruth McCormick, Director of State and Federal Affairs, at [rmccormick@bcse.org](mailto:rmccormick@bcse.org).

Sincerely,

Lisa Jacobson  
President, Business Council for Sustainable Energy

## **The Business Council for Sustainable Energy Comments for the Second Phase of the Quadrennial Energy Review: An Integrated Study of the U.S. Electricity System**

July 1, 2016

### **Executive Summary**

The Business Council for Sustainable Energy is a trade group representing companies and trade associations in the energy efficiency, natural gas, and renewable energy sectors. Its members are on the front lines of the dramatic and rapid changes that are impacting the U.S. electricity system.

The Department of Energy (DOE) has solicited comments on the second iteration of the Quadrennial Energy Review: An Integrated Study of the U.S. Electrical System. The Council appreciates the opportunity to make recommendations for Federal action to address the challenges and opportunities associated with a changing electricity system. In particular, these comments are responsive to DOE's request for recommendations on the evolution of the nation's generation portfolio, the implications of a hybrid generation system, and the integration of renewables, and the benefits of energy efficiency, demand response, and natural gas for grid resiliency.

The Council's comments offer perspectives and recommendations in several areas that will provide for the long-term strength, flexibility, and resilience of the U.S. electricity system. The Council would like to acknowledge the input received from numerous trade associations and partner organizations, including the American Gas Association, the American Wind Energy Association, First Solar, Gridwise Alliance<sup>1</sup>, the Natural Gas Supply Association, the Sacramento Municipal Utility District and the U.S. Green Building Council.

Of note, as a diverse business coalition, not all BCSE members take positions or endorse the recommendations expressed in this submission.

In addition to the more detailed recommendations below, in general, when assessing the risks and needs of the U.S. electricity system, several issues should be considered:

- **A holistic approach is required.** The Department of Energy should give consideration to market trends, the evolving needs of energy infrastructure, regulatory issues, and current financing practices and business models. At the same time, DOE should recognize that a "one size fits all" approach will not result in a broad base of clean energy technologies being deployed, as different technologies have different characteristics.
- **The electricity grid should function as an "enabling platform" for the evolving grid system and electric reliability must be prioritized as the grid evolves.** Ensuring a reliable electric grid is vital as we integrate growing amounts of variable energy resources, distributed generation, and electric vehicles into our nation's evolving energy portfolio. Building an electric grid more resilient to natural disasters and malevolent acts, as well as to physical damage and cyber-attacks will be needed to ensure power throughout the U.S. is reliable.

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<sup>1</sup> Gridwise Alliance's comments are available here:  
[http://www.gridwise.org/documents/GWA\\_16\\_QERComments\\_Phase1.2\\_Final.pdf](http://www.gridwise.org/documents/GWA_16_QERComments_Phase1.2_Final.pdf)

- **New grid functions and systems are using more information and communications technology (ICT).** This creates opportunities for enhanced efficiency and automation, but also increases the importance of cyber security protocols. ICT is also a driver of increased consumer engagement in energy management in homes and the private sector.
- **Consideration should be given to the distinct and valuable roles that the government, the private sector, and other stakeholders play in planning, managing, and financing energy infrastructure.** Each has a role to play, and coordination and cooperation among these groups is essential for efficient functioning of and equitable access to the electric grid. Coordination among these groups also ensures that the benefits of generation diversity and appropriate valuation of publicly owned assets or investments are retained.
- **Energy efficiency, demand response, distributed generation, and natural gas are the most readily available and effective tools for increasing grid resiliency.** In addition to these technologies, using the full portfolio of available clean generation technologies is necessary to achieve a resilient and reliable grid.

## A Changing U.S. Energy Landscape

The Council, in partnership with Bloomberg New Energy Finance (BNEF), produces an annual [Sustainable Energy in America Factbook](#) to track the investment and market trends in the U.S. energy sector. The 2016 edition documents the continued transformation of how the U.S. produces and consumes energy. The Factbook records and highlights the important developments that transpired in U.S. energy over the prior 12 months. It also provides a look back over the past seven years, and in some cases decades, to show trends in the U.S. energy sector. The Factbook contains information that is directly related to DOE's study of the U.S. electricity system from generation to end use. It should serve as an important tool as DOE focuses the QER on the challenges and opportunities facing the electricity sector, including its role in promoting economic competitiveness, energy security, and environmental responsibility. The Council submitted a complete copy of the Factbook to the Department of Energy at the QER stakeholder meeting in Washington, DC on February 4, 2016.

As the Factbook shows, 2015 will surely be remembered as a watershed year in the evolution of U.S. energy, as the industry passed important milestones and the federal government finalized critical new policies. The already rapid de-carbonization of the U.S. power sector accelerated with record numbers of coal plant closures and solar photovoltaic system commissionings, while natural gas production and consumption hit an all-time high. Concurrently, the U.S. continued to enjoy greater benefits from energy efficiency efforts as economic growth outpaced the growth in electricity consumption. The Factbook shows that energy productivity – the ratio of U.S. GDP to energy consumed – continues to grow, improving by 2.3% from 2014 to 2015. The U.S. economy has grown by 10% since 2007, while primary energy consumption has fallen by 2.4%.

The net result on the planet: U.S. power sector CO<sub>2</sub> emissions fell to their lowest annual level since the mid-1990s. The net impact on consumers: negligible to positive as prices for electricity and fuel remained low by historic standards and customer choices expanded. Perhaps most importantly, many of the key changes seen in 2015 are likely permanent shifts, rather than temporary adjustments due to one-time events.

## **Policy Support of a Clean Electricity Grid**

On the policy front, major initiatives are poised to keep the U.S. on track toward de-carbonization in the coming decades. These opportunities, if seen to fruition, have the potential to meet some of the challenges of a rapidly changing grid system. In August, the Obama administration finalized its Clean Power Plan regulation for the existing U.S. power fleet. In December, the U.S. joined with 194 other nations in France to adopt the “Paris Agreement” which includes pledges to rein in emissions over the coming decades. The full adoption and implementation of these initiatives will be major steps towards a cleaner and more resilient grid.

In Congress, the 2016 spending bill enacted at the end of 2015 included a five-year extension of the Production Tax Credit (PTC) for wind power and a five year extension of the Investment Tax Credit (ITC) for solar, with gradual ramp-down of these credits. BCSE is pleased that the solar and wind sectors received a long-term extension of these credits, as well as language that will enable them to be used when construction on a project starts. Having stable tax policy for these industries is providing predictable market conditions, which enables them to grow, reduce costs and attract investment.

Additionally, the Protecting American Taxpayers and Homeowners (PATH) Act, enacted at the end of 2015, extended incentives for energy efficiency to December 31, 2016. However, incentives for the non-wind and non-solar technologies that currently access the PTC and ITC will expire on December 31, 2016, if Congress does not take action. These technologies include: combined heat and power, microturbines, fuel cells, small wind, biomass, geothermal, landfill gas, waste to energy, hydropower, marine and hydrokinetic.

In order to maintain a diverse portfolio of beneficial clean energy technologies, it is critical that Congress formulate and enact the stable, long-term tax policy framework that will support the deployment and use of clean energy technologies in a meaningful way. Energy tax incentives should be established in such a way that the tax benefits are provided to all qualifying technologies in accordance with the energy, environmental and other public benefits they generate. Additionally, it is important that any such changes establish a sufficient duration to provide investors with the confidence they need to proceed with major investments.

State policy is also an effective driver of renewable energy. Twenty-nine states have some type of renewable energy mandate and twenty-four have binding energy savings targets. It is important for DOE to work with states in crafting collaborative policies for the electricity system in order to achieve environmental and energy policy goals.

## **Government’s Role in Electricity Grid Planning**

Government bodies at all levels have influence over the electricity system. Specifically, government bodies establish market rules, provide regulatory oversight, grant permits, fund research, development, and deployment programs, and offer incentives to spur investments. In addition, local, state, and federal government bodies have leading roles to play in planning and coordinating responses to cyber threats and damage to the physical grid. Furthermore, in various parts of the country, government entities are directly responsible for power generation, including ownership of renewable assets, and energy distribution.

Efficient and consistent policies and approval processes that can adapt to changing dynamics are needed. Balanced, technology-neutral policies aimed at reducing energy intensity and carbon emissions are crucial for grid resilience. Policies should also be designed to recognize the specific needs and values of all technologies. Decisions on infrastructure planning involve many public and private sector actors and these investments are long lived. Decisions made now will have a strong impact on the resiliency and reliability of the grid as far as

2050 and beyond so it is crucial that these decisions are made with the grid of the future in mind. As such, DOE and other federal agencies should use their collective technical capacity and convening resources to educate and exchange information among these entities on a consistent basis.

The Council also encourages DOE to continue and expand collaborative efforts to improve the safety and resiliency of the grid. For example, DOE has an opportunity play a leading role in the development of “smart cities.” Legislation is being developed that would improve the Federal government’s coordination and outreach with respect to smart cities technologies, promote the quality and performance of smart cities, provide assistance to cities, and expand international cooperation on smart cities technologies. Smart cities provide resilience and reliability to the electricity system, and improve coordination between customers and their electricity use. DOE should fully engage in this opportunity for increased smart cities coordination.

The Council strongly believes that clean energy technologies, such as energy efficiency, natural gas, and renewable energy are essential to achieving U.S. environmental and energy policy goals in a cost-effective manner. Policies that recognize the contribution of these technologies are critical for clean energy growth and corresponding benefits to the electricity grid.

Government bodies should undertake the following actions informed by the experiences and expertise of the private sector and stakeholders:

- Update market rules to efficiently meet the needs of the changing power system
- Provide appropriate value and pricing mechanisms that recognize flexible resources and ancillary services
- Provide technical assistance and share best practices among government, private sector, and stakeholder representatives
- Fund research, development and deployment programs that reduce costs and speed innovation in the design and operation of the electricity system

### **Integration of Renewable Energy Generation**

Renewable energy generation continues to grow. For example, an estimated 8.5GW of wind and 7.3GW of solar photovoltaic was installed in 2015. Importantly, surging renewables and coal retirement have not triggered a dramatic leap in retail power prices. Average retail electricity rates across the country remain 5.8% below the recent peak (2008). Corporate procurement of clean energy also continues to grow, doubling from 2013 to 2014 and again from 2014 to 2015. In 2015 alone, corporations contracted 3.1GW of new renewable capacity. Building on current trends, the U.S. electricity system will integrate a growing amount of renewable energy generation in the years and decades ahead.

Integration of renewable technologies such as solar, wind, hydropower, geothermal, biomass, and waste-to-energy has multiple benefits, including reduction of CO2 emissions and greater resiliency for the grid. However, continued growth of certain renewables is impeded by lack of sufficient transmission infrastructure as well as restricted market access for non-utility generation in certain parts of the country.

As illustrated in further detail in the American Wind Energy Association’s comments on the QER 1.2, building reliable and resilient transmission infrastructure is a key part of supporting the integration of these renewable energy technologies. Upgrading the nation’s grid through effective transmission planning, cost allocation, and siting policies is absolutely necessary for the continued growth of renewable energy generation. DOE should

work with states, utilities, and other stakeholders to expedite the planning and siting of an expanded and modernized electric transmission infrastructure.

Further, it is important to note that a “one size fits all” approach will not result in a broad base of renewable energy technologies on the system, as different renewable energy technologies have varying characteristics.

### **Building and Maintaining a Reliable and Resilient Grid**

A functioning and affordable electricity system is a cornerstone of a healthy American economy. Risks to the system also represent risks to regional economies. In response to DOE’s questions about the best strategies to improve the resilience of the electricity system, the Council believes the best method is to embrace a portfolio approach to the electricity sector. The Council supports the utilization of the full portfolio of energy generating options to increase grid flexibility, as well as other actions, including flexible conventional generation, grid storage, new transmission, more responsive loads, and changes in power system operations. Different power generating technologies face different forms of operational risk. Combining these different technologies into one electricity system that also includes physical and cyber safeguards can mitigate many of these potential risks. In addition to the integration of renewable generation discussed above, the inclusion of energy efficiency, demand response, and natural gas is necessary for a diverse and reliable generation portfolio.

#### *Energy Efficiency and Demand Response*

Robust energy efficiency, demand response, and distributed generation programs, including combined heat and power (CHP), can help lighten the load for supply resources during times of high energy demand. These options can also help support the integration of more intermittent renewable generation.

Energy efficiency is the cheapest and most readily available tool for reducing energy demand on the electricity system. Data for 2014 – the last year for which we have estimates – show that annual investment in energy efficiency measures continues to grow. Energy Savings Performance Contracting (ESPC) investment topped \$6.4 billion in 2014, and corresponding electricity savings hit 25GWh in 2015. Efficiency investment in the residential sector shrank slightly, but expanded in commercial, industrial, and other sectors. The Southeast remains a largely untapped market with fewer enabling policies such as energy efficiency resource standards (EERS).

DOE should also consider the full range of policies and programs already available to assist in the deployment of energy efficiency. Market focused standards and ratings systems such as ENERGY STAR and the U.S. Green Building Council’s PEER (Performance Excellence in Electricity Renewal) rating system for micro grids are a crucial aspect in promoting energy efficiency. These programs provide industry professionals with tools to assess new developments in efficiency technologies. Ensuring the appropriate evaluation, measurement, and verification of the savings and benefits of energy efficiency programs is essential for their continued success.

Demand response is another valuable tool in the effective management of electricity for a resilient grid. Smart meter installations hit a peak in 2010 and 2011, supported by 2009 stimulus funding. Deployments have slowed considerably since then, but the demand response market will benefit from the Supreme Court upholding FERC’s Order 745. That decision ended uncertainty for demand response markets and should allow them to flourish more broadly. Additionally, U.S. prices for smart meters have declined since 2013, but not as quickly as in other nations. Policy initiatives such as the \$3.5 billion in smart grid R&D announced in QER 1.0 will help to boost the smart grid investment and bring advanced technologies to market.

CHP can reduce peak kilowatt needs and defer the need for electric system upgrades and additional generation facilities. Although natural gas remains the most common fuel source for CHP, other fuel sources, such as propane, are used when natural gas is not available. Due in part to low natural gas prices, investment in CHP has also increased, with installations up 25% over 2013 levels. However, CHP is still hampered by lack of supportive state and federal regulations. The Council encourages DOE to support policies that remove barriers and provide incentives for CHP installations.

### *Natural Gas*

The United States possesses abundant natural gas supplies capable of meeting greater demand from the electric sector as well as other sectors of the economy. In 2015, the power industry hit a major milestone when generation fueled by natural gas surpassed that of coal. Natural gas provides consistent baseload generation that can be quickly ramped up or down, and supports the integration of variable energy resources like solar and wind. It is therefore essential to the continued resilience of the electricity grid.

A critical component of a healthy and robust natural gas market is adequate and reliable infrastructure. Natural gas end uses continue to grow with new domestic demand from electric power generation, industrial consumption, and within homes and businesses. Serving these additional consumers requires investments into new infrastructure projects as well as improving the existing infrastructure base. Companies across the country are upgrading natural gas pipeline infrastructure by replacing cast iron and unprotected steel pipelines with newer plastic and protected steel to improve safety and reduce methane emissions by avoiding planned and unplanned leaks. Since 1990, natural gas utility companies have installed more than 600,000 miles of main and service lines that serve 18 million more customers, more than a 30% increase in both cases. In 2015, transmission pipeline companies installed over 11 Bcfd of total pipeline capacity. The Federal government should work with states and localities to ensure the efficient siting and building of natural gas infrastructure.

### **Information and Communications Technology (ICT) Infrastructure**

As the U.S. electric grid becomes interconnected with real time communications systems, ICT can be used to improve the reliability, resiliency, and efficiency of electric grid infrastructure, and help reduce pollutant emissions through better real-time monitoring and control of grid systems.

In order to meet the challenges of a changing electricity system, an increased role for ICT is expected and strategically planned and managed integration will be important. Without continually enhanced ICT in the TS&D infrastructure, the grid cannot achieve important 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 and costly excess capacity. One study showed that effective use of ICT has the potential to reduce America's total energy consumption by 12-22% by 2020. Simply put, grid-related investment in ICT provides enormous benefits for energy efficient economic growth, and enhanced use of non-polluting energy resources.

Electric customers are demanding more options for their energy service, eager to capitalize on new technologies and gain more control over their energy choices and use. ICT plays a crucial role in meeting this demand. Recognizing the important role ICT plays in shaping a resilient, efficient, and responsive grid is essential.

## **Conclusion**

The nation's electricity system is critical to the productivity of the U.S. economy and the safety and security of U.S. citizens. With significant changes in the system underway, government bodies, the private sector, and stakeholders must work together to update market rules and establish the policy framework and incentive structures to spur the long-term planning and investments needed to provide consumers with affordable, reliable, and clean energy products and services. The Business Council for Sustainable Energy thanks DOE for the opportunity to share its views on the second phase of the Quadrennial Energy Review. For questions about this submission, please contact: Ruth McCormick, Director of State and Federal Affairs, at [rmccormick@bcse.org](mailto:rmccormick@bcse.org).