

Testimony of
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Committee on Energy and Natural Resources
Hearing to Examine the Electricity Sector in a Changing Climate
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Chairman Murkowski, Ranking Member Manchin, and Members of the Committee, thank you for the opportunity to testify and to share the Business Council for Sustainable Energy's views on electricity sector dynamics in a changing climate.

My name is Lisa Jacobson, and I serve as the President of the Business Council for Sustainable Energy, or BCSE. On behalf of the Council, I would like to express our appreciation for the longstanding work of the Senate Committee on Energy and Natural Resources. We commend the Committee for its accomplishments in the 115th Congress and look forward to working with its members as it seeks to address pressing federal policy issues impacting the U.S. energy sector in the areas of resilient infrastructure, grid modernization, cyber security, energy efficiency and streamlining the siting and permitting process. The Committee's bipartisan approach is also to be commended, as that is key to enacting durable and predictable policies that will spur energy sector investment.

BCSE is a coalition of companies and trade associations representing the energy efficiency, natural gas and renewable energy sectors. Founded in 1992, the Council advocates for policies that expand the use of commercially-available clean energy technologies, products and services. Its membership includes project developers, industrial manufacturers, equipment and technology providers, independent electric power producers, investor-owned utilities, public power and energy and environmental service providers.

BCSE is pleased to now also have an independent initiative under its banner, the Clean Energy Business Network (CEBN). CEBN represents small- and medium-size businesses providing clean energy technologies and services.

Together, BCSE and CEBN represent a broad range of the clean energy economy, from Fortune 200 companies to small businesses working in all 50 states and over 350 Congressional districts. On a national basis, the energy efficiency, natural gas and renewable energy sectors support over 3 million U.S. jobs.

BCSE and CEBN members have a wide range of energy policy interests. As a broad-based coalition of businesses and trade associations, not all BCSE and CEBN members take a position on or endorse the views offered in this testimony.

The Council believes it is critical that Congress formulate and enact stable, long-term energy policy frameworks that leverage and align with state and local policies, as well as the private sector, to support investment and job creation. The 2005 Energy Policy Act and the 2007 Energy Independence and Security Act contained numerous provisions that have helped to shape the energy landscape of today. We look forward to working with this Committee to enact bipartisan legislation that will provide policy direction to guide investment over the next decade and beyond.

In my testimony today, I will focus on several areas:

- The rapid changes that have occurred in the U.S. electricity sector;
- The factors that have contributed to these changes;
- And, understanding that this Committee does not have jurisdiction on emissions policy, what the impact of these changes have been on U.S. electricity sector emissions over time; and
- Finally, I will address several federal energy policies should be considered to support continued investment and emission reductions in the electricity sector, as well as the U.S. economy overall.

The testimony incorporates several of the findings of the 2019 Sustainable Energy in America Factbook,¹ which was released on February 13, 2019, by the Business Council for Sustainable Energy and BloombergNEF. The 2019 Factbook is the seventh edition of the report and provides up to date, annual national information on key trends in the U.S. energy sector. The 2019 Factbook includes a comprehensive overview section as well as detailed charts, graphs and sources for information. It is developed each year to serve as a reference guide of leading energy statistics for use by policymakers and other stakeholders.

The U.S. Electricity Sector is in the Midst of a Rapid and Structural Transformation

Energy efficiency, natural gas and renewable energy are the growth areas of the U.S. electricity sector, delivering affordable, safe and reliable power to homes and businesses. Further, investment in these sectors – combined with the deployment of a range of technologies such as energy storage, combined heat and power, and fuel cells, along with demand response, automation and digital applications – is decarbonizing the power sector, keeping electricity costs low and creating jobs.

Carbon capture, utilization and storage can also play a role, especially with new policies like the extended and expanded 45Q tax credit in place.²

The electricity sector is changing in other ways as well – both in terms of technology integration and its interconnection with buildings and transportation. Decentralized systems are emerging, and multiple technologies can be integrated to provide a balanced and flexible system. Further,

¹ Business Council for Sustainable Energy, *2019 Sustainable Energy in America Factbook*, available at: <http://www.bcse.org/factbook/>.

² See, <https://www.catf.us/2019/02/ccs-reduce-49-million-tonnes-co2-emissions/>.

grid-connected buildings and vehicles are responding to electricity system needs, providing new sources of system flexibility.

Just as the sector is getting more decentralized, it is also being impacted by natural disasters and is facing the threat of cyber attacks. As such, the sector is looking to become more resilient, but the process is ad hoc and slow. In terms of physical resilience, there are more technology options available to fortify centralized and distributed energy systems, including advanced microgrids, bi-directional inverters and more responsive substation operations. In some cases, utilities can address resilience through their own expenditures, but in other cases private equity and third-party financing, as well as various energy-as-a-service models offer public-private partnership opportunities for communities and facilities looking to become more resilient.

From the cyber security perspective, there are important efforts underway. This work must continue, and this Committee's role is critical.

Statistics from the 2019 edition of the Sustainable Energy in America Factbook recently released by BCSE and BloombergNEF document several noteworthy overarching electricity sector trends:

The U.S. electricity generation mix is changing rapidly:

- Natural gas accounts for 35 percent of electricity generation, making it the number one source of U.S. electric power, up 25 percent over a five year period;
- Renewable energy generation accounts for 18 percent of U.S. electricity generation, nearly on par with the nation's nuclear fleet;
- Coal generation has declined, ending 2018 at 27 percent of the power mix; and
- Looking back over the past twenty-five years, natural gas and renewable energy represent over 94 percent of U.S. electric capacity additions, pointing to a structural change in the power generation mix.

Energy efficiency investment has reached new heights:

- Total U.S. spending on energy efficiency through formal frameworks – such as utilities, Energy Savings Performance Contracts (ESPCs) and Property Assessed Clean Energy Programs (PACE) – climbed to a record level of \$15 billion in 2017 (the most recent year for which data is available).

Electricity prices are low for households and businesses:

- Consumers devoted a smaller share of their spending in 2018 towards electricity than at any time ever recorded, and the total share of household expenses dedicated to energy costs overall also hovered near an all-time low;
- The U.S. remains competitive globally for energy-intensive industries thanks to low industrial power prices;

- Natural gas prices have fallen dramatically over the last decade: industrial prices have fallen 59 percent; commercial gas prices have declined 37 percent and residential prices have declined 21 percent. In 2018, the average price was \$3.20/MMBtu.
- Prices for wind and solar Power Purchase Agreements (PPAs) have also fallen dramatically as the levelized costs decline.

Energy efficiency, natural gas and renewable energy provide U.S. jobs:

- The renewable energy, energy efficiency and natural gas sectors supported over 3 million U.S. jobs in 2017.³

The Factbook also outlines the growing contributions of corporations and states in driving change in the energy sector.

The business community stepped up to drive demand:

- Retailers, major technology firms, and even a major oil company contracted record volumes of renewable power through direct contracts, amounting to 8.6. gigawatts of capacity in 2018. This is being driven increasingly by economic factors, including low renewable power prices and the ability to lock in predictable electricity prices over a period of time.
- Companies pledged to double energy productivity or to green their vehicle fleets, with electric, fuel cell and renewable natural gas powered vehicles.

States continued to engage in clean energy policymaking:

- California promised to achieve 100 percent renewables by 2045 while other states including Nevada, New Jersey and New York adopted new policies on renewables, efficiency, and battery deployment pledges. Florida agreed to allow third-party PV installers to operate in the state.

Contributions to the Changing U.S. Electricity Sector

The market dynamism in the electricity sector is partly credited to policy frameworks – at the federal, regional, state and local levels – combined with the new wave of activity by corporations in terms of electricity sector investment, renewable energy procurement and energy efficiency spending.

At the federal level, there are numerous examples of policies that have been implemented over the past ten to twenty years that have contributed to the changing electricity sector.

³ The 2019 U.S. Energy and Employment Report will be released on March 6, 2019 by National Association of State Energy Officials (NASEO), the Energy Futures Initiative (EFI).

Examples include:

- energy efficiency standards and investments;
- tax policy;
- research, development and deployment initiatives at the Department of Energy;
- federal government leadership programs;
- air quality initiatives and public-private partnerships in the areas of clean energy technology deployment and emission reductions at the Environmental Protection Agency; and
- energy use and emissions reporting initiatives.

However, it is important to note that not all available clean energy technologies have benefitted from these policy levers, and more can and should be done to enable an opportunity for all technologies to compete.

Looking forward, policy frameworks are most effective when they focus on desired outcomes, and enable the full portfolio of diverse power generation technologies to participate. Further, policy frameworks should leverage private sector activity and create sustainable market-signals for investment. As stated in the report *Energy 2020, A Vision for America's Energy Future*,⁴ the federal government can help remove roadblocks due to outdated approaches and provide strong support and funding levels for research, development and deployment.

Federal policy should not be considered in isolation. State, regional and local policies – and private sector activity – are critical to determining deployment trends and electricity costs. As the recent Breakthrough Energy report, *Advancing the Landscape of Clean Energy Innovation*, states:

“Successful clean energy innovation on a large scale in the U.S. requires alignment of key players, policies and programs among the private sector, federal government and state and local governments.”⁵

This is due in large part to the significant role that cities, states and regions have in determining power sector policies, which impact electricity generation, distribution and efficiency policies. And, with the increasing interest in companies, communities and other energy end users in having more control over their energy choices, federal decisionmakers should be mindful of these trends and seek to leverage this capital when considering policy options.

Electricity Sector Emissions Trends

The power sector has reduced its carbon emissions by over 25 percent in the past decade as it has expanded its use of natural gas and renewable energy, reduced its coal generation and benefitted

⁴ Senator Lisa Murkowski, *Energy 2020: A Vision for America's Energy Future*, 2013. https://www.energy.senate.gov/public/index.cfm/files/serve?File_id=C691A024-1004-4D49-8DE9-A976CE0D2BF3.

⁵ Breakthrough Energy, *Advancing the Landscape of Clean Energy Innovation*, February 2019. <http://www.b-t.energy/reports/advancing-the-landscape/>.

from sustained investments in energy efficiency. However, in 2018, power plants produced 3.3 percent more electricity. Thanks to a cleaner generation mix and improved energy efficiency, power sector emissions grew at a much more modest pace, 0.6 percent year-on-year. This resulted in the continuing decline in the carbon-intensity of the electricity sector.

It is interesting to contrast this with the emissions trends in other sectors of the U.S. economy and to consider why those emissions increased. While one year of data is insufficient to establish a trend, it is important to consider the possible causes for these increases in 2018. This is important as the power sector and the U.S. economy as a whole need to make significantly deeper emission reductions to meet the levels recommended by the scientific community to avoid the worst impacts of climate change.

A Deeper Dive into 2018 Emissions: Economic growth, along with extreme weather, pushed energy demand to an all-time high

Total U.S. greenhouse gas emissions rose for the first time in several years in 2018, increasing by 2.5 percent as overall energy demand increased in buildings and industrial sectors, and to a lesser extent, power and transport. Total gross greenhouse gas emissions now sit at roughly 10 percent below 2005 levels.

The U.S. economy in 2018 grew at its fastest pace in five years, posting an annualized GDP expansion rate of 2.9 percent. For the first time in several years, energy consumption grew at a faster clip than GDP, rising 3.3 percent over the same time period.

Seasonal factors played an important role, as extreme weather boosted demand for both heating and cooling in the buildings sectors. The U.S. set a record for the most "cooling-degree days" (as defined by the Energy Information Administration) since at least 1990 causing Americans to use more air-conditioning to remain comfortable. The number of "heating degree days" bucked a long-term declining trend to hit their highest level since 2014.

Meanwhile, the increase in overall energy use belied slower growth in transportation consumption (up 0.7 percent), as Americans continued to buy larger, less fuel-efficient cars, but vehicle miles traveled leveled off.

Electricity demand as measured in terawatt hours grew at a slower pace of 2.2 percent. In other words, although overall energy productivity (a comparison of energy consumption and GDP) declined in 2018, the U.S. continued to grow more productive and efficient in its use of electricity.

Federal Policy Recommendations for the 116th Congress

BCSE supports a range of policies that share bipartisan support and we hope will be enacted in the 116th Congress in the areas of infrastructure, research, development and deployment and tax policy.

Maintaining strong levels of funding for research, development and deployment initiatives at the Department of Energy is critical. Thanks to the leadership of this Committee, the 115th Congress enacted strong funding bills for DOE's Office of Energy Efficiency and Renewable Energy, Office of Electricity, Office of Fossil Energy and other key areas at the agency to ensure the U.S. invests in energy innovation. BCSE believes that Congress and the Trump Administration should once again support this critical area for the U.S. economy, U.S. competitiveness and job creation.

BCSE also views infrastructure as an area of bipartisan support and interest and has compiled a range of policy ideas from its members related to infrastructure modernization and resilience. These span the topics of streamlining permitting and siting, electric transmission, energy efficiency in buildings and resilience and infrastructure financing.

One focus of the Committee has been in the area of hydropower. BCSE greatly appreciates and thanks this Committee for the hydropower provisions adopted last year as part of the America's Water Infrastructure Act (AWIA). Those provisions were an important first step, but additional comprehensive licensing reforms are still needed. We hope that provisions like those contained in last year's bipartisan Senate energy bill will be advanced in this Congress. BCSE looks forward to discussing these ideas, as well as others, with Committee members in the weeks ahead.

Tax policy has been a leading federal energy policy for over a decade. As such, it is essential to enact the energy tax extenders for energy efficiency and the non-wind Production Tax Credit technologies (hydropower, waste to energy, biomass, biogas and geothermal). This is needed to provide a more even competitive environment for investment in these sectors. With the bipartisan introduction of the Tax Extender and Disaster Relief Act of 2019 on February 28 by Senate Finance Committee Chairman Chuck Grassley and Ranking Member Ron Wyden, BCSE hopes this can move quickly this session. BCSE also supports a range of other energy tax related measures addressing sectors such as building efficiency, energy storage and sustainable transportation.

To address global climate change, alignment is needed between the private sector and policies at local, state, regional and national levels. On a national basis, BCSE supports federal legislative action to address climate change mitigation and to improve resilience. The congressional hearings over the past month show a renewed and bipartisan focus on federal climate change policy. Critical to any climate change policy is that it be market-based and inclusive of the broad range of readily-available clean energy technologies that can reduce emissions – affordably and reliably. Smart policies will focus on leveraging private sector investment and send strong and long-term market signals to reduce emissions.⁶

⁶ See, BCSE Climate Change Statement, available here: [https://www.bcse.org/images/2019%20Clean%20Air/BCSE%20Climate%20Change%20Policy%20Principles%20\(2019\).pdf](https://www.bcse.org/images/2019%20Clean%20Air/BCSE%20Climate%20Change%20Policy%20Principles%20(2019).pdf).

Conclusion

To maintain a diverse portfolio of energy technologies, Congress should formulate and enact stable, long-term policy frameworks that will support the deployment of the full scope of clean energy technologies in a meaningful way. These measures span power generation, building efficiency and transportation and can provide significant public benefits in the areas of energy reliability and security as well as environmental, economic and jobs benefits.

BCSE looks forward to working with this Committee to achieve these objectives. For questions or further information, please contact Ruth McCormick on the Council's staff at rmccormick@bcse.org.