

Testimony of the Honorable Bruce J. Walker
Assistant Secretary, Office of Electricity
U.S. Department of Energy
Before the
U.S. Senate Committee on Energy and Natural Resources
Subcommittee on Energy

July 9, 2019

INTRODUCTION

Chairman Cassidy, Ranking Member Heinrich, and Members of the Subcommittee, it is an honor and a privilege to serve at the Department of Energy (DOE or the Department), as Assistant Secretary for the Office of Electricity. DOE is charged with, among other important responsibilities, providing our Nation with premier energy research and development (R&D) activities. The work being conducted by DOE is setting the course for various advancements in the energy field and beyond. Issues like energy storage, improving energy efficiency, creating breakthroughs in how we extract and utilize our Nation's fossil fuels, and Artificial Intelligence are just some of the important areas of DOE research. These are also the topics being covered at today's hearing.

Thank you for the opportunity to testify today on behalf of the Department regarding these various pieces of legislation. The Administration continues to review all eleven of these bills. Below are some highlights and perspectives regarding the legislation being discussed today.

ENERGY STORAGE

DOE applauds Congress in recognizing that energy storage is a technology of national interest and the backbone of a future resilient energy system. With benefits extending to transportation, the power grid, and throughout the economy, DOE has been proactive in developing new tools and technologies to accelerate energy storage development, such as through the Grid Modernization Initiative (GMI), the Advanced Energy Storage Initiative (AESI), and the Grid Storage Launchpad (GSL).

In May of this year, DOE issued its most recent Grid Modernization Lab Call, with Energy Storage and System Flexibility as one of the major topic areas. The lab call placed a particular emphasis on developing the storage functions that enhance system resilience and flexibility.

The proposed GSL will extend U.S. R&D leadership in energy storage through validation, collaboration, and acceleration. By validating new technologies at earlier maturity stages, the GSL will lower the time and expense of storage chemistry innovations. Through collaboration with universities and the commercial sector, the GSL will augment the industry with enhanced testing protocols and in-operando characterization capabilities. Finally the GSL will accelerate and de-risk new technologies by propagating rigorous grid performance requirements to all stages of storage development, from benchtop to systems.

DOE established the Mission Need for the GSL at Critical Decision 0 (CD-0) in November of 2018. We anticipate finalizing the preferred alternative facility and cost range as part of CD-1 this summer. The FY 2020 Budget requested funds for design and construction planning of the GSL.

The FY 2020 Budget also proposes an AESI led by DOE's Offices of Electricity (OE) and Energy Efficiency and Renewable Energy (EERE), in conjunction with the Offices of Fossil Energy (FE) and Nuclear Energy (NE). AESI will provide a platform to coordinate R&D activities across these programs—and existing energy storage efforts in the Office of Science (SC) and the Advanced Research Projects Agency (ARPA-E)—to establish aggressive, achievable, and measurable goals for cost-competitive energy storage technologies, services, and applications. In FY 2020, AESI will establish application-specific cost and performance metrics to align research objectives and to coordinate the development of new energy storage and flexibility technologies.

Finally, OE's Energy Storage Program continues to conduct research and development to expand storage capabilities and shared industry knowledge. From performance breakthroughs in batteries based on earth-abundant materials to evaluation tools and workshops for state regulators, OE is at the forefront in helping communities realize the benefits of energy storage.

Last month, Chairman Murkowski visited one of our most recent projects, a megawatt-scale battery designed for load following and frequency regulation, located at Cordova Electricity Co-operative in Alaska. In FY 2020 and beyond, OE will continue work that lowers cell and system costs; reduces critical element usage; increases performance; and elevates safety of grid-connected energy storage systems. In general, all of these bills would build on the successes underway with energy storage technologies at DOE.

To focus any new program's efforts on the highest-impact breakthrough technologies, we recommend replacing the term "energy storage system" with the term "electrical energy storage system" to refer to bidirectional electrical energy storage systems that have capability to both absorb electric energy and inject the stored energy back into the grid and introducing the term "flexible energy resource" for other technologies that can shift energy demand in time and provide other services to the grid.

S. 1741 – Reducing the Cost of Energy Storage Act of 2019

This bill requires the Secretary of Energy (Secretary) to "establish a cross-cutting national program within the Department of Energy to advance energy storage deployment."

The goals of the new program will include considerations of lifecycle management, cost-competitiveness, innovation, use cases, market barrier reductions, safety, deployment pathways, analytical assistance, manufacturing leadership, and supply chain risks.

The program would also establish technology cost targets differentiated by technology class, such as electrochemical, pumped hydro, mechanical, or thermal.

DOE agrees with the bill in recognizing that energy storage is a cross-cutting activity.

The program should have the flexibility to establish cost targets by application (*i.e.*, seasonal storage or peak shifting) rather than by technology. An application-centric approach would help stakeholders evaluate storage benefits and accelerate the path toward commercialization.

S. 1602 – Better Energy Storage Technology (BEST) Act

This bill requires the Secretary to establish a “research, development, and demonstration program of grid-scale energy storage systems” within OE.

The new R&D activities would be focused on cost-effective energy storage systems with specific performance characteristics that would be applicable to daily, weekly, or seasonal cycling.

The bill would also direct the Secretary to establish technology-neutral cost targets, taking into account electricity market prices and the goal of being cost-competitive in specific markets for electric grid products and services.

Finally, the bill would direct the Secretary to “accelerate the standardized testing and validation of grid-scale energy storage systems” in collaboration with our National Laboratories.

DOE agrees with the bill in recognizing that energy storage is a cross-cutting activity. Many of these activities, such as establishing market-aware, cost-competitive, and technology-neutral cost targets, are currently underway as part of the AESI, which includes activities in OE and across multiple programs in EERE. The Office of Science also supports extensive battery R&D efforts specifically through the Joint Center for Energy Storage Research. Providing resources and a formal structure for these activities will help the Department accelerate storage technology development and commercialization.

S. 1593 – Promoting Grid Storage Act of 2019

This bill requires the Secretary to establish a “cross-cutting national program...for the research of energy storage systems, components, and materials.” The bill would also require a “technical assistance and grant program” to provide technical assistance and grants to facilitate energy storage adoption.

DOE agrees with and recognizes the need to provide analytical technical assistance, especially for state, local, and other relevant stakeholders as they seek to understand the benefits of energy storage systems.

S. 1183 – Expanding Access to Sustainable Energy Act of 2019

DOE has provided support for state and local governments to integrate renewable energy and utilize new applications such as cybersecurity and smart grid technologies. The Expanding Access to Sustainable Energy Act would establish an energy storage and microgrid grant and technical assistance program within the Department, focusing on rural electric cooperatives.

The Department continues to review the legislation and looks forward to working with Congress as the legislative process moves forward.

S. 2048 Joint Long Term Storage Act of 2019

The purposes of this legislation are to facilitate the development of long-duration energy storage technologies, increase commercial viability of long-duration energy storage technologies, and increase the energy resilience, energy security, and national security of the United States through the use of long-duration energy storage technologies.

This legislation establishes a demonstration initiative to pilot the potential benefits of long-duration energy storage, increase commercial viability, recognize the range of grid services, quantify the value of those services, identify a range of technology types, and improve integration of energy storage and the grid.

The bill requires ARPA-E and the Department of Defense's Environmental Security Technology Certification Program to establish a joint program to carry out demonstration projects at scale and help technologies become commercially viable with priority given to demonstration projects that will be carried out in the field.

DOE appreciates Congress's attention to energy storage issues, and continues to evaluate this legislation.

ENERGY EFFICIENCY

EERE is, among other strategic goals, aiming to improve the energy efficiency of our nation's homes, buildings, and industries. EERE has set milestones for providing energy savings of 25 percent – 50 percent by 2020–2030. By developing new materials, technologies, and processes for American homes, buildings, and industry, EERE will implement threshold energy performance standards, improve building energy codes, and support home weatherization.

S. 983 – Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act of 2019

The Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act of 2019 updates and reauthorizes the DOE Weatherization Assistance Program (WAP) through 2024. The President's Budget requests no funding for the WAP. DOE recognizes that the Department of Health and Human Services and state entities allow for the transfer of LIHEAP funds to the state weatherization agency or may provide separate funding to the state weatherization agency. DOE also understands Congressional interests in the program, and continues to manage them consistent with statute.

S.1857 – Federal Energy and Water Management Performance Act of 2019

The Federal Energy and Water Management Performance Act of 2019 is structured into two key areas: establishing energy and water performance requirements for Federal buildings, with an increased emphasis on water management activities; and codifying the Federal Energy Management Program (FEMP) and its activities and authorities which are currently directed to the Secretary by statute and delegated to FEMP by the Secretary. Given its complexity, the Department continues to review this bill and believes that the Secretary should retain authority over the program.

FOSSIL ENERGY

FE is responsible for Federal research, development, and demonstration efforts on advanced power generation; power plant efficiency; water management; and carbon capture, utilization, and storage (CCUS) technologies. Additionally, FE is responsible for the development of technological solutions for the prudent and sustainable development of our unconventional oil and gas domestic resources.

S. 1685 - Launching Energy Advancement and Development through Innovations for Natural Gas Act of 2019

The Department is advancing an important part of FE's R&D portfolio — the commercial deployment of CCUS technologies. With ongoing support, the Department is backing up its commitment to CCUS with R&D necessary to advance these technologies, improve our environmental footprint, and advance U.S. world leadership in this critical area.

This bill directs DOE to establish a program for the capture of carbon dioxide produced during the generation of natural gas-generated power.

Specifically, DOE must:

- identify opportunities to accelerate the development of commercially viable carbon capture technologies to reduce carbon dioxide emissions;
- enter into cooperative agreements with certain entities to license, permit, construct, and operate at least three facilities to capture carbon dioxide from natural gas- fueled power generating facilities; and
- identify any barriers to the commercial development of carbon capture technologies.

The Department is reviewing the proposed language and we look forward to working with the Committee.

S. 1064 – Appalachian Energy for National Security Act

The United States is now the top producer of oil and natural gas in the world, with an additional benefit in the form of increased natural gas liquids (NGL), including ethane. Ethane is particularly useful as a feedstock for petrochemical manufacturing.

The Appalachian region has experienced near-exponential growth in natural gas production, and that production is expected to increase for decades to come. According to the Energy Information Administration, through April of this year, natural gas production in the Appalachian Basin has represented 35 percent of total U.S. natural gas production, and that

number is expected to increase.¹ In addition, NGL processing and fractionating capacity in Appalachia has grown quickly to match this increase in natural gas production.

S. 1064 requires a report to Congress on the “national and economic security” impacts of petrochemical infrastructure near the Marcellus, Utica, and Rogersville shale plays. Under the bill, DOE has the lead for preparation of the report, in consultation with the Departments of Defense and Treasury (and other agencies and stakeholders).

DOE appreciates Congress’ attention to the vast energy resources in Appalachia. This legislation builds upon current efforts by the Administration. In December of 2018, DOE issued a report to Congress entitled *Ethane Storage and Distribution Hub in the United States*. The report highlights the potential in Appalachia for the development of a new ethane hub based on the resource from the Marcellus and Utica shales, and the accompanying security and reliability benefits derived from geographic diversity in the nation’s petrochemicals manufacturing base.

This past April, the President issued Executive Order 13868 (“Promoting Energy Infrastructure and Economic Growth”), part of which requires DOE to issue a report on economic development in Appalachia in the petrochemical industry. The Department is currently working on this report, and will share the results with Congress and other interested parties.

WEST VALLEY DEMONSTRATION PROJECT REAUTHORIZATION

The West Valley Demonstration Project came into being through the West Valley Demonstration Project Act of 1980. The Act makes DOE responsible for solidifying the high-level waste, disposing of waste created by the solidification, and decommissioning the facilities used in the process.

H.R. 1138 – West Valley Demonstration Project Reauthorization

This bill reauthorizes the West Valley Demonstration Project located in West Valley, New York, through FY 2026.

The FY 2020 Budget request \$78 million for the site, which provides for completion of deactivation activities at the Main Plant Process Building to reduce risk. The proposed legislation would not impact DOE’s legal obligations.

VETERAN’S HEALTH INITIATIVE

The Department is eager to assist in promoting the physical and economic health of our veterans, who have given so much in service in the nation.

S.143 – DOE Veteran’s Health Initiative Act

¹ Sum of YTD Appalachian production from Drilling Productivity Report divided by total U.S. dry production <https://www.eia.gov/petroleum/drilling/> (production by region tab) and https://www.eia.gov/naturalgas/monthly/pdf/table_01.pdf <https://www.eia.gov/todayinenergy/detail.php?id=38652>

The DOE Veteran's Health Initiative Act authorizes DOE to establish and carry out a research program in artificial intelligence and high performance computing, focused on the development of tools and technology to solve big data and large scale analytics challenges in partnership and coordination with the Department of Veterans Affairs. The bill also requires DOE to carry out a pilot program to develop tools for big data analytics in order to advance artificial intelligence technologies to solve complex big data challenges.

This bill is strongly aligned with the Administration's stated R&D budget priorities including: American Leadership in Artificial Intelligence, Maximizing Interagency Coordination, and a Workforce for the 21st Century Economy. The Administration continues to review the bill.

CONCLUSION

Thank you again for the opportunity to testify today on behalf of DOE. The Department appreciates the ongoing bipartisan efforts to address our nation's energy challenges, and looks forward to working with the Committee on the legislation on today's agenda and any future legislation.

I would be happy to answer your questions.