U.S. DEPARTMENT OF ENERGY

Secretary of Energy Advisory Board

Recommendations on Grid Modernization

Presented to the Secretary of Energy on April 9, 2024

The following recommendations were approved unanimously by all members present at the April 9, 2024 public meeting.

The Grid Modernization Working Group of the SEAB examined options for supporting the development of the grid. The Department of Energy (DOE) received significant new authorities and funding in the Infrastructure and Investment Jobs Act and the Inflation Reduction Act. DOE has already implemented its new authorities and achieved significant progress in deploying them. Thus, these recommendations build on the great work and many accomplishments that have already occurred under the Secretary's leadership. DOE's Grid Deployment Office also deserves special recognition. The Working Group recognizes that, at this point, no recommendation it can offer will be news to the Secretary or DOE.

The Grid Modernization Working Group members included Norman C. Bay (Working Group Chair), Paula Gold-Williams, Dr. Shirley Ann Jackson, and Maria Pope.

Recommendations

1. **Continue to act with urgency**. While being mindful of the need to make prudent and thoughtful investments, press forward with the resources that DOE currently has. As DOE's National Transmission Needs Study indicates, to meet national goals of a carbon free grid by 2035, regional transmission capacity must more than double and interregional transmission capacity must more than quintuple. Given the timeline to build major transmission infrastructure, there is not a moment to lose. In addition, recent reports indicate load is growing faster than expected across the United States. This load growth is generally attributed to electrification, increased industrial activity, climate change, and an AI-driven need for data centers. Extreme weather events are also more severe and frequent than in the past. Interconnection queues for renewables are backlogged in part because of a lack of transmission capacity.

2. **Focus on the big regional and interregional projects, both on shore and offshore**. These projects are the hardest to build. They raise difficult issues with respect to cost allocation, planning, and permitting. They are also capital intensive and take the longest time to build. The Administration's goal of developing 30 GW of offshore wind off the East Coast by 2030 will not happen without substantial additional transmission capacity. Transmission capacity along the coast cannot yet accommodate large injections of utility-scale wind. Interregional lines improve economic efficiency in the energy markets, enhance reliability (particularly during extreme weather events), and help integrate renewables. A March 7, 2024 NREL study notes the benefits of creating interregional renewable energy zones that deliver low cost renewables to load.

3. **Support innovation and grid enhancing technologies**, including energy storage, advanced conductoring, dynamic line ratings, topology optimization software, and AI applications. Support assessments of GETS, including undergrounding technologies, to increase deployment. Continue to promote and fund robust battery R&D to expand

capabilities and reduce costs, and to support the use of batteries of as transmission and distribution assets, while still recognizing the need for new transmission.

4. **Optimize the authorities and capabilities of the Power Marketing Administrations**. The PMAs own about 14% of the transmission in the United States. Although they have many priorities, including important statutory obligations for preference customers, they also have significant authorities that should be used to boost the capacity of the grid. WAPA, for example, has a Transmission Infrastructure Program that allows it to borrow up to $3.25 billion from the Treasury to build transmission that facilitates the delivery of renewable energy. Section 1222 of the Energy Policy Act of 2005 also allows federal-private partnerships to develop transmission, with the only geographic limitation in section 1222 being that the projects be located within a state in which WAPA or SWPA operate (an area that covers much of the United States). WAPA could increase the capacity of the eastern-western interconnects and enable the use of its existing authorities. The PMAs could also showcase the use of grid enhancing technologies and reconductor existing lines.

5. **Create an Office of Electric Reliability**. This office would focus on planning, modeling, and analytic support on electric reliability issues, relying upon the technical resources of the National Laboratories. As part of its charter, it could also coordinate Department assistance in modeling and providing quantitative analysis on resource adequacy issues for policymakers at the state, regional, and federal levels. This office could support the development of planning processes that consider evolving electricity demands, load forecasting for electrification and changing climate, and new distribution designs and architecture, as well as planning processes that examine delivery system investment value and optimize aggregate investment.

6. **Support the National Interest Electric Transmission Corridor (NIETC) process and invest resources in furthering the process.** DOE deserves credit for completing the National Transmission Needs Study, and the initial window for public submission of information and designation on NIETC designation closed on February 2, 2024. DOE will next have to refine the geographic boundaries of potential NIETCs, prepare a draft report, conduct community engagement, and perform required environmental reviews. DOE will ultimately have to make designations. A final designation could be controversial, subjected to legal challenge, and require commitment from DOE to the process and its exercise of the authority.

7. **Provide technical assistance and support for developing sound policy at the Federal Energy Regulatory Commission**. DOE can leverage the engineering, modeling, and analytic capabilities at the National Labs to provide technical and quantitative assistance to FERC on policy issues. DOE has filed comments in major FERC rulemakings and should continue to look for opportunities to collaborate with FERC and to provide

technical assistance. DOE should also look for opportunities to be a resource for and to provide trainings to state regulators and policymakers.

8. **Continue to strengthen supply chains for critical grid technologies**, including transformers and HVDC technologies, so that there is an adequate domestic supply. In June 2022, the President authorized DOE to use the Defense Production Act to accelerate the domestic production of critical grid components, including transformers. In March 2024, NREL recently estimated that distribution transformers capacity will have to increase by 160 to 260% by 2040 from 2021 levels. Resources at the Department of Energy, including the Loan Program Office, may be helpful in building out supply chains.

9. **Support legislation that increases federal funding for developing transmission, as well as other policy support**. The IIJA has a number of useful authorities, including the Transmission Facilitation Program. More funding is important, especially when compared to the need, the mismatch between funding for new generation and transmission, and the benefit-cost ratio for new transmission. In addition, Congress could support interregional transfer capability and permitting reform.