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INSIGHT

IIJA: Efforts to Address Electric Transmission for Reliability, Resilience, and Renewables

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With the February 2021 electricity blackouts in Texas, the past summer blackouts in the Pacific Northwest, and the recurring power outages in California, attention focused on how addressing transmission issues could help address reliability and other arising issues. With the retirement of many older coal and natural gas facilities, many states and regions are becoming more reliant on imported power from their neighbors, even as region-wide weather and other challenges limit the surplus power availability. Another common issue is transmission congestion, which can occur when insufficient paths for the economic flow of power exist, and can result in an increased cost of electricity.

Transmission congestion adversely affects several U.S. regions, as a lack of capacity to efficiently transmit electricity leads to the curtailment of power generation, and can result in increased electricity prices. In some cases, renewable electricity from wind and solar facilities cannot get to customers as power lines do not have enough transmission capacity. Transmission congestion has been an acute issue for the pipeline of renewable projects in the Midwest. Between 2016 and 2020, an estimated 245 advanced stage renewable energy projects were reported withdrawn due to congestion and related grid upgrade costs, representing approximately 40% of projects in the Midcontinent Independent System Operator's queue.

Investment in new transmission facilities remains an area of government interest. The Federal Energy Regulatory Commission (FERC), which oversees the reliability of the U.S. bulk power system, initiated a proposed rulemaking process that considers the potential need to improve how transmission lines are planned and paid for, as well as the process by which new generators—including solar and wind farms—connect to the grid.

Increased transmission ties could also potentially enhance national electric grid reliability and resilience by increasing the ability of power to flow across U.S. regions to where power is needed. A more efficient transmission system could potentially allow more states to meet goals for renewable energy generation. Some of the higher quality renewable sources for electricity are on the Outer Continental Shelf, where high quality wind and tidal resources exist. However, these coastal resources will likely need a large increase in transmission capacity onshore, as well as high-voltage direct-current transmission systems to bring that power onshore to networks.

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The use of hydrogen for electricity generation might benefit from additional investment in electricity transmission infrastructure. Rather than building new, or modifying existing, pipelines to transport hydrogen from production sites to electricity generators, electricity might be generated on-site and transmitted to demand centers by enhanced or new transmission lines.

Increased electric transmission capacity would likely also improve transmission efficiency. On average, about 2% of energy generated in the United States is lost in the transmission process (with almost 4% also lost in the distribution system). Shorter transmission lines operating at lower voltages tend to lose more energy (relatively speaking) than longer, higher voltage lines. Increased and more efficient transmission capacity could help to minimize these losses.

The Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) includes several key provisions related to transmission modernization and expansion, with the general goals of improving electric grid reliability and resilience. These provisions may also incentivize building new transmission lines to access renewable energy resources, and potentially increase linkages between the Eastern and Western Interconnections. While these interconnections largely operate independently from each other, approximately 1,300 megawatts of transmission capacity connect the three transmission systems (including the independent grid run by the Electric Reliability Council of Texas).

In particular, Section 40105 of IIJA revises the process for designation of a National Interest Electric Transmission Corridor (NIETC) by the Department of Energy (DOE). A key revision allows for an NIETC designation that may lead to new interstate transmission lines specifically for intermittent (e.g., renewable) energy to connect to the electric grid. Another key change in the section enhances FERC's "backstop" siting authority for transmission lines in NIETCs. This would allow FERC to supersede traditional state permitting of transmission facilities and issue a permit for the construction and operation of certain interstate facilities under defined circumstances, including when a state has denied an applicant's request to site transmission facilities.

Section 40106 establishes the ''Transmission Facilitation Program,'' under which DOE can facilitate the construction of electric power transmission lines and related facilities. Under this program, DOE may potentially enter a capacity contract (for no more than 40 years or 50% of the total capacity) with respect to an eligible transmission project; issue a loan to an eligible entity for an eligible transmission project; or participate with an eligible entity in designing, developing, constructing, operating, maintaining, or owning an eligible transmission project. Thus, under a capacity project, DOE could be closely involved in operational support of eligible transmission-line construction. Such an arrangement could help move a transmission project from proposal to construction, as a transmission project is unlikely to be built without significant customer commitment to its use. Section 40106 also establishes a "Transmission Facilitation Fund" to help finance eligible projects deemed to be in the public interest.

The new authorities accorded to DOE in the IIJA may help future planning for the grid and its needs increase a focus on national and regional priorities, while allowing for additional coordination with states who retain primary siting authority for electric transmission lines.

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