

Date of Hearing: April 17, 2024

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY

Cottie Petrie-Norris, Chair

AB 2779 (Petrie-Norris) – As Amended March 21, 2024

SUBJECT: Independent System Operator: transmission planning

SUMMARY: Requires the California Independent System Operator (CAISO) to report to the California Public Utilities Commission (CPUC) and to relevant policy committees in the Legislature any new use of and cost savings derived from the deployment of grid enhancing technologies (GETs) deemed reasonable in the Transmission Planning Process (TPP).

EXISTING LAW:

- 1) Establishes the CAISO as a nonprofit public benefit corporation and requires the CAISO to ensure efficient use and reliable operation of the electrical transmission grid consistent with achieving planning and operating reserve criteria. (Public Utilities Code § 345.5)
- 2) Requires the CPUC to consider in its Certificate of Public Convenience and Necessity review cost-effective alternatives to a transmission facility, including targeted energy efficiency, ultraclean distributed generation, and other demand reduction resources. (Public Utilities Code § 1002.3)

FISCAL EFFECT: Unknown. This bill is keyed fiscal and will be referred to the Committee on Appropriations for its review.

BACKGROUND:

California's climate goals – SB 100 (de León, Chapter 312, Statutes of 2018) established the state policy that renewable and zero-carbon resources supply 100% of retail sales and electricity procured to serve all state agencies by 2045 (the 100% Clean Energy Policy).¹ This policy was updated under SB 1020 (Laird, Chapter 361, Statutes of 2022) which accelerated the requirement on state agencies to 100% by 2035, and established interim targets to meet the sector-wide 100% goal. California's clean power goals parallel the state's goals for achieving net zero greenhouse gas (GHG) emissions and 100% new zero-emission vehicle sales by 2035.^{2,3} Taken together, electricity demand in California is expected to nearly double by 2040,⁴ requiring heavy investment in the state's power grid to meet its net zero goals. These ambitious climate targets establish the planning goal that informs all subsequent electricity procurement and transmission planning.

Transmission Planning – Transmission lines carry electric energy from one point to another in an electric power system. As the transmission system is the connecting point between generation resources (supply) and consumers (demand), planning for transmission construction – both new and upgrading old – requires an understanding of both future generation resource needs (capacity

¹ Public Utilities Code § 454.53

² AB 1279 (Muratsuchi, Chapter 337, Statutes of 2022)

³ Executive Order N-79-20

⁴ CAISO; *20-Year Transmission Outlook*; January 2022.

and location) and consumer demand changes. Therefore, transmission planning requires a robust planning process that considers all aspects of electricity supply and demand.

California has a complicated but robust electric planning and procurement regime spread across the California Air Resources Board (CARB), the CPUC, the California Energy Commission (CEC), and the CAISO. Much of this regime focuses on resource procurement needed to meet our clean energy goals, however, the direct downstream effect of the procurement planning is planning for the transmission needed to accommodate the new generation. The main elements of the regime are the Scoping Plan at CARB, the Integrated Energy Policy Report (IEPR) at the CEC, the Integrated Resource Plans (IRP) and Resource Adequacy (RA) process at the CPUC, and finally the Transmission Planning Process (TPP) at the CAISO.

Briefly:

- The Scoping Plan establishes a target range for the electricity sector’s greenhouse gas (GHG) emission reductions;
- The IEPR, among other considerations and actions, provides a demand forecast to anticipate statewide load in the next decade or longer;
- The IRP forecasts system generation resource needs to meet the customer demand forecast by the IEPR 10 years in the future;
- The RA identifies resources needed to meet customer demand and ensure reliability today; and
- The TPP identifies the transmission needs to interconnect and balance the system supply provided by the IRP with the customer demand provided by the IEPR.

CAISO’s TPP is updated annually and culminates in a CAISO Board of Governors approved transmission plan that identifies the needed transmission solutions and authorizes cost recovery through CAISO transmission rates, subject to federal regulatory approval. Following the CAISO Board’s approval of a TPP, new projects that are identified as necessary go through a competitive solicitation process. Transmission developers apply for the project solicitation and those applications are evaluated on a number of qualifying criteria, including cost. Most recently, the CAISO released its 2023-2024 TPP draft on April 1, 2024,⁵ and identified 26 projects – at an estimated \$6.1 billion – needed for reliability and to meet state policy goals; two of these projects are expected to be eligible for competitive solicitation.

GETs – According to the U.S. Department of Energy (DOE), an estimated 70% of transmission and distribution lines in the U.S. are well into the second half of their 50-year life expectancy.⁶ As transmission lines age, they become more inefficient, increasing the likelihood of congested power lines, which can force operators to reroute power through less optimal paths and rely on more expensive or less clean power generation.⁷ Extreme cases of transmission constraints may even overload transmission systems, forcing utilities to employ periodic load shedding tactics (i.e., rolling blackouts).

To facilitate the clean energy transition, GETs have been posed by researchers and industry leaders as an interim, cost-effective solution to unlock transmission capacity in the near term and

⁵ CAISO; *2023-2024 Transmission Plan Draft*; April 2024.

⁶ DOE; “What does it take to modernize the U.S. electric grid?”; <https://www.energy.gov/gdo/articles/what-does-it-take-modernize-us-electric-grid>; October 2023.

⁷ DOE; *Grid-Enhancing Technologies: A Case Study on Ratepayer Impact*; February 2022.

buy time for long-term transmission planning. GETs encompass a suite of technologies – such as advanced conductors,⁸ dynamic line ratings,⁹ advanced power flow control devices,¹⁰ and analytical tools – that can be used to maximize the transmission of electricity across existing lines. According to the Federal Energy Regulatory Commission (FERC), GETs can cost less than 10% of the cost of investing in new transmission lines, and can save millions in annual congestion costs.¹¹ As a result, FERC has recently taken steps to push for consideration and adoption of GETs, through incentive programs supported by the federal Bipartisan Infrastructure Law.¹²

COMMENTS:

- 1) *Author’s statement.* According to the author, “Given the urgency for the state to meet its clean energy goals, a shorter-term solution is needed to maximize transmission capacity. Grid-enhancing technologies (GETs) encompass a suite of technologies that increase the capacity and efficiency of the existing transmission system. Given that GETs can be deployed faster than building new transmission infrastructure, they allow California to better utilize its existing infrastructure and provide short-term solutions to temporary operational challenges, such as during outages or when new lines are under construction. GETs may also serve an important role of bridging a gap until a permanent transmission expansion is completed. AB 2779 will provide transparency on the frequency and best use of GETs under consideration in the CAISO TPP, by having the CAISO report on their usage.”
- 2) *Small steps today for giant leaps tomorrow.* Years-long permitting processes across multiple agencies, community opposition, and high costs mean it can take a decade to build new transmission infrastructure. While the state is recontemplating its permitting processes to get new transmission projects built and connected, more interim solutions may be needed to meet increasing energy demand in the short-term given the urgency for the state to meet its clean energy goals. GETs may offer a method to maximize existing transmission capacity in a relatively cost-effective way.¹¹ For example, recent research by the University of California, Berkeley’s Energy Institute at Haas found that replacing existing power lines with advanced conductors, or reconductoring, could roughly double the capacity of the electric grid in many parts of the country, making room for more wind and solar power.¹³

Though supporters of GETs are concerned that the technologies have yet to be widely adopted in California and the U.S., the CAISO has considered GETs as potential

⁸ Advanced conductors enable higher operating temperatures, higher capacity for electrical current, and reduced line sag.

⁹ Dynamic line ratings adjust thermal line ratings based on actual weather conditions, including ambient air temperature and wind speed/direction.

¹⁰ Advanced power-flow control devices swiftly control the impedance, or opposition to current, in real time to ensure that power is delivered on lines that have the capacity to carry it.

¹¹ Utility Dive; “Regulators need to require utilities to use grid-enhancing technologies: FERC’s Clements”; <https://www.utilitydive.com/news/transmission-grid-enhancing-technologies-gets-utilities-naruc-ferc-clements/699686/>; November 2023.

¹² DOE; “Grid Resilience and Innovation Partnerships (GRIP) Program”; <https://www.energy.gov/gdo/grid-resilience-and-innovation-partnerships-grip-program>.

¹³ WP 343R, Energy Institute at Haas; “Accelerating Transmission Expansion by Using Advanced Conductors in Existing Right-of-Way”; February 2024.

alternatives in the TPP for many years. They note particular success in selecting flow controllers in a number of cases in past plans and approving for the first time a project employing advanced conductors in the 2022-2023 TPP; in the 2023-2024 draft TPP, CAISO recommended GETs to increase resiliency in the Humboldt area.⁵

The electric investor-owned utilities (IOUs), at the prompting of CAISO's recommendations and their own acknowledgment that the high stakes for addressing climate change requires grid modernization and optimization,^{14,15} are also actively researching and considering GETs. San Diego Gas and Electric (SDG&E) reports that they have deployed phase shifting transformers at one of their substations; they are currently testing dynamic line rating devices; and they are currently pursuing a grant application for the implementation of advanced conductors on a 138 kV reconductor project.¹⁶

This bill proposes CAISO to report any GETs it selects in its TPP, in line with their ongoing review of this technology to date. Such reporting will provide transparency and reassurance that the state is actively considering short-term and cost-effective solutions to ensure grid resiliency, resource adequacy, and clean power generation.

3) *Related legislation.*

AB 3246 (Garcia) would require the CPUC to update its General Order 131-D to provide exemptions from certain approvals and environmental assessments for GETs, specifically advanced reconductoring, as specified. Status: *set for hearing* in this committee on April 17th, 2024.

SB 1006 (Padilla) would require IOUs to jointly prepare a GETs strategic plan, aimed towards cost-effectively increasing transmission capacity and interconnection of renewable and zero-carbon energy resources, by January 1, 2026. Would require each IOU to complete an evaluation every 4 years of the benefits and cost-effectiveness of reconductoring their transmission and distribution lines with advanced conductors. Status: *set for hearing* in the Senate Committee on Energy, Utilities and Communications on April 16th, 2024.

4) *Prior legislation.*

SB 1020 (Laird) accelerated the 100% Clean Energy Policy to require electricity procured to serve all state agencies be 100% clean energy by 2035, and established interim targets to meet the sector-wide 100% goal. Status: Chapter 361, Statutes of 2022.

AB 1279 (Muratsuchi) declared the policy of the state to achieve net zero GHG emissions by 2045 and to ensure that, by 2045, statewide anthropogenic GHGs are reduced to at least 85% below 1990 levels. Status: Chapter 337, Statutes of 2022.

¹⁴ Southern California Edison; *Smart Grid Strategy & Roadmap*; https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.smartgrid.gov/files/documents/Southern_California_Edison_Smart_Grid_Strategy_Roadmap_201012.pdf&ved=2ahUKEwjO4Jmn1biFAxUQIDQIHceGAQkQFnoECB8QAQ&usg=AOvVaw0dQV7eYsK-mpFbs2UjujaB.

¹⁵ Pacific Gas & Electric; *PG&E R&D Strategy Report*; June 2023.

¹⁶ Per data request from SDG&E on February 9th, 2024.

SB 100 (de León) established the state policy that renewable and zero-carbon resources supply 100% of retail sales and electricity procured to serve all state agencies and California end-use customers by 2045. Status: Chapter 312, Statutes of 2018.

REGISTERED SUPPORT / OPPOSITION:

Support

Advanced Energy Economy
California Farm Bureau Federation
California State Association of Electrical Workers
Coalition of California Utility Employees
Environment California

Opposition

None on file.

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