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**SENATE COMMITTEE ON ENERGY, UTILITIES AND  
COMMUNICATIONS**  
**Senator Ben Hueso, Chair**  
**2021 - 2022 Regular**

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**Bill No:** ACR 188 **Hearing Date:** 6/15/2022  
**Author:** Holden  
**Version:** 5/2/2022 Introduced  
**Urgency:** **Fiscal:** No  
**Consultant:** Nidia Bautista

**SUBJECT:** Independent System Operator: regional cooperation: study

**DIGEST:** This measure requests, by February 2023, the California Independent System Operator (CAISO), in consultation with the California balancing authorities, produce a report that summarizes recent relevant studies on the impacts of expanded regional cooperation on California, as specified.

**ANALYSIS:**

Existing law:

- 1) Establishes that U.S. Federal Energy Regulatory Commission (FERC) as exclusive jurisdiction over the transmission of electric energy in interstate commerce. Also establishes the process and procedures for establishing transmission of electric energy in interstate commerce by public utilities, i.e., the rates, terms, and conditions of interstate electric transmission by public utilities. (Federal Power Act §§§201, 205, 206 (16 USC 824, 824d, 824e))
- 2) Establishes that FERC has exclusive jurisdiction over sales of electric energy at wholesale in interstate commerce by public utilities, i.e., the rates, terms, and conditions of wholesale electric sales by public utilities. (Federal Power Act §§§201, 205, 206 (16 USC 824, 824d, 824e))
- 3) Provides for the restructuring of the electricity industry and creates several entities: the Energy Oversight Board (defunct), the Power Exchange (defunct) and CAISO. (Public Utilities Code §334 *et seq.*)
- 4) Establishes the CAISO governing board with five members appointed for three-year terms by the governor and subject to confirmation by the Senate. (Public Utilities Code §337 *et seq.*)

- 5) Charges CAISO with management of the transmission grid and related energy markets in order to ensure the reliability of electric service and the health and safety of the public. (Public Utilities Code §345.5)
- 6) Expresses the intent of the Legislature that CAISO transform into a regional organization to promote the development of regional electricity transmission markets in the western states and to improve the access of consumers served by CAISO to those markets, only when such transformation is in the best interest of California ratepayers. Directs CAISO to prepare changes to its governance that would allow it to transform into a regional organization, but prevents such changes to CAISO governance from taking effect until several specified steps have occurred, including that the Legislature enact statute implementing the proposed governance changes. (Public Utilities Code §359.5)
- 7) Established the renewable portfolio standard (RPS) which requires the California Public Utilities Commission (CPUC) to establish a RPS requiring all retail sellers to procure a minimum quantity of electricity products from eligible renewable energy resources. (Public Utilities Code §399.16)

This measure would request that by February 2023 the CAISO, in consultation with the California balancing authorities (BAs), produce a report that summarizes recent relevant studies on the impacts of expanded regional cooperation on California and identifies key issues that will most effectively advance the state's energy and environmental goals, including:

- 1) relevant updates to specified transmission development and resource diversity estimates and discussion of regional transmission organizations in Colorado, Nevada, and other regional states,
- 2) collaboration between states on energy policies to maximize consumer savings while respecting state policy autonomy, and
- 3) engagement between neighboring states on the future of regional transmission organizations in the west.

## **Background**

*About the U.S. power grid.* Electricity supplied by power plants moves through a complex network of electricity substations, power lines, and distribution transformers before it reaches customers. Local electricity grids are interconnected to form larger networks for reliability and commercial purposes. The electric grid

consists of the bulk power systems, high-voltage transmission equipment, and the distribution system, which are generally lower voltages. North America is comprised of two major and three minor alternating current grids or “interconnection,” which operate largely independently from each other with limited transfers of power between them. The United States electric power system in the Lower 48 states is made up of three main interconnections:

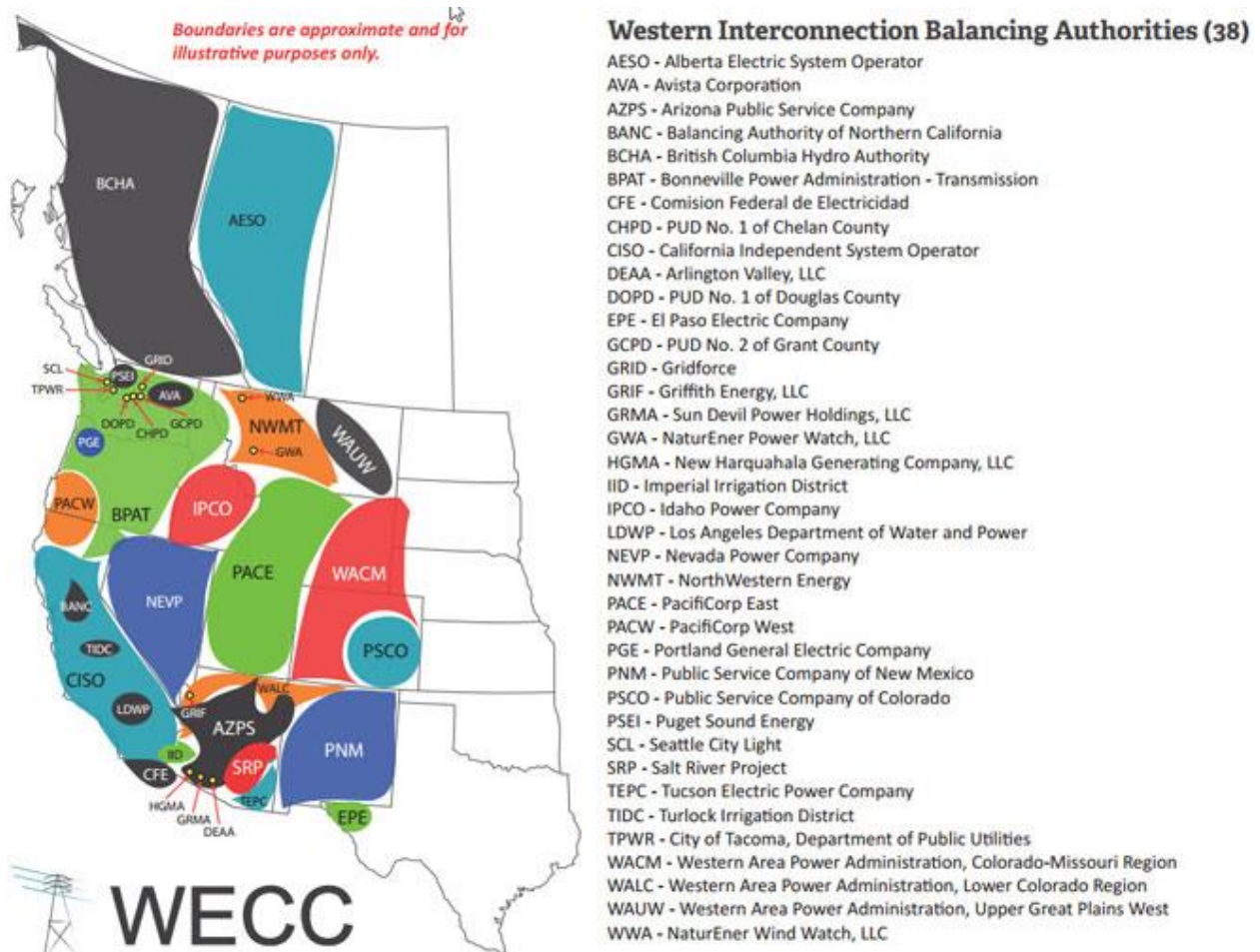
- The Eastern Interconnection – the area east of the Rocky Mountains and a portion of northern Texas, which consists of 36 BAs.
- The Western Interconnection – the area from the Rockies west, stretching north into Canada and south to Baja California in Mexico and consists of 38 BAs.
- The Electric Reliability Council of Texas (ERCOT) – covers most of Texas and consists of a single BA.

Many entities interface to ensure bulk power system reliability:

- The North American Electric Reliability Corporation (NERC) is a not-for-profit international regulatory authority whose mission is to assure the reliability and security of the bulk power system in North America.
- Regional Entities have responsibility delegated by NERC for assuring bulk power system reliability in their respective footprints. Western Electric Coordinating Council (WECC) is the Regional Entity responsible for the Western Interconnection.
- Reliability Coordinators (RC) monitor the grid in real-time and interact with individual operators and other RCs to maintain reliable operations.
- BAs are responsible for maintaining load-generation balance within their footprint.
- Independent System Operators (ISO) and Regional Transmission Operators (RTO) coordinate, control and monitor portions of the electric grid. ISOs and RTOs may also operate wholesale electricity markets. The Western Energy Imbalance Market (EIM) is a real-time market operated by the CAISO.

*About the Western Interconnect.* There are 38 separate BAs operating across the interconnected western United States (known as the Western Interconnect which is managed by the WECC), (as shown below). All of the electric utilities in the Western Interconnection are electrically tied together during normal system conditions and operate at a synchronized frequency of 60 Hz. Within the Western Interconnection are 38 BAs, including the CAISO, Balancing Authority of Northern California (BANC), Los Angeles Department of Water and Power (LADWP), Turlock Irrigation District (TID) and Imperial Irrigation District (IID),

as wells as several outside California. According to the WECC, the generation capacity of the Western Interconnection makes up approximately 20 percent of all capacity in the United States and Canada.



*About BAs.* The actual operation of the electric system is managed by entities called BAs. A “balancing authority” is an entity responsible for managing the transmission of high-voltage electricity across long-distance transmission lines. BAs must operate at a synchronized frequency of 60 Hz. The BA ensures in real-time that power system demand and supply are finely balanced. If demand and supply fall out of balance, the result can be local or wide-area blackouts. BAs also must manage transfers of electricity with other BAs. The NERC issues mandatory reliability standards which are approved by the FERC and mandated on BA.

*RTOs/ISOs.* Most BAs are electric utilities that have taken on the balancing responsibilities for a specific portion of the power system. All of the RTOs in the United States also function as BA. Nine RTOs/ISOs operate bulk electric power systems across much of North America. As a practical matter RTOs and ISOs are

largely the same. RTOs are independent, membership-based, non-profit organizations that ensure reliability and optimize supply and demand bids for wholesale electric power. RTOs first developed in the 1990s to accommodate the FERC policy to encourage competitive generation through requiring open access to transmission. RTOs dispatch power by feeding both day-ahead and real-time bids from both generators and load-serving entities into complex optimization software. These entities are often compared to air traffic controllers because they manage the electron traffic on a power grid they do not own, as traffic controllers manage airplanes landing and taking off on airport runways. RTOs have different types of members, including: independent generators, transmission companies, and load-serving entities, integrated utilities that combine generation, transmission and distributions functions, and power marketers and energy traders. RTOs and ISOs operate a region's electricity grid, administer the region's wholesale electricity markets, and provide reliability planning for the region's bulk electricity system.

*About the CAISO.* The CAISO is a nonprofit public benefit corporation that was created by California statute as part of the effort to deregulate the electricity market in the late 1990s. The CAISO manages the flow of electricity across the high-voltage bulk power system that makes up 80 percent of California's and a small part of Nevada's electric grid. CAISO is registered as both a transmission operator and BA under the NERC reliability functional model. As a general matter, BAs may contain transmission operators. For example, some participating transmission owners with the CAISO are also registered as transmission operators under the NERC reliability functional model. As with other BAs, the CAISO is FERC and NERC regulated. However, unique to the CAISO, as compared to other RTOs, is the appointment of the CAISO governing board members who are appointed by the governor and require confirmation by the Senate.

*CASIO Energy Imbalance Market (EIM).* As part of its management of the wholesale electric market, the CAISO also operates a voluntary EIM. The EIM is a real-time bulk power trading market involving 19 participants across ten western states that trades the difference between the day-ahead forecast of power and the actual amount of energy needed to meet demand in each hour. Energy trade in the EIM is limited and intermittent. Currently, the EIM handles generation that a participating utility considers surplus at the last minute. However, the CAISO is in the midst of active proposal to expand the EIM functions, including potential inclusion of day-ahead transactions. According to the CAISO, the EIM is serving 77 percent of the demand for electricity in the Western United States, and has achieved over \$2 billion in benefits to customers in CA and elsewhere.

*SB 350 Studies.* Several parties have pushed for transformation of CAISO into a regional body that would manage high-voltage electricity transmission for entities

located throughout the Western Interconnect. Generally, the argument for a Western region electric grid is that a regional BA would better coordinate planning and dispatch of electricity resources across the West. Proponents of regionalization assert that greater reliance on intermittent renewable resources, such as wind and solar energy, necessitate such increased coordination in order to benefit from both exporting and importing electric generation during the ramps when resources are declining or increasing.

In passing SB 350 (De Leon, Chapter 547, Statutes of 2015), the Legislature expressed its intent that CAISO regionalize. Specifically, SB 350 states the intent of the Legislature as:

*To provide for the transformation of the Independent System Operator into a regional organization to promote the development of regional electricity transmission markets in the western states and to improve the access of consumers served by the Independent System Operator to those markets, and that the transformation should only occur where it is in the best interests of California and its ratepayers.*

SB 350 called upon CAISO to modify its governance structure to accommodate regionalization. The bill, however, conditioned implementation of the proposed governance changes upon several actions. Among those actions:

- Completion of studies (SB 350 studies) of the effects of the regionalization on ratepayers, the environment, disadvantaged communities, and safety and reliability.
- Public hearing.
- And enactment of statute implementing the revised governance changes which has not occurred.

CAISO completed its studies in 2016, finding, among other things, that regionalization of the electric grid to incorporate most of the U.S. portion of the Western Interconnection could yield California ratepayers with \$1 billion to \$1.5 billion annually as of 2030, potentially benefitting California ratepayers in 2-3 percent reduction in their rates. According to the studies, those benefits came from:

- Reduced capital investments for RPS-related procurement, resulting from less need for curtailment and access to lower-cost renewable resources.
- Reduced production, purchase and sales costs for wholesale electricity.
- Reduced capital investment from regional load diversification.

- Reduced grid management charges for system and market operations.

The studies also acknowledged “regional [electric] market benefits significantly depend on the size of the regional market.” The results of the studies were not universally embraced.

As required by law, state energy and air regulators held public hearings on the CAISO regionalization studies. The administration explored regionalization with its counterparts in other Western states. In addition, legislative staff organized many inclusive stakeholder meetings. Stakeholders never reached consensus over the details of regionalization, the most contentious issues being governance, environmental effects and potential actions by the FERC, concerns that only increased after the presidential elections in 2016.

*Extended Day Ahead Market (EDAM).* In addition, the EIM, the CAISO released its EDAM straw proposal on April 28<sup>th</sup>. According to the CAISO, this initial iteration of the straw proposal, which reflects the input of stakeholders and customers, seeks to establish the framework for key design elements of the day-ahead market as well as areas requiring additional work and stakeholder input. Comments are due in mid-June and the proposal will be refined over the next six months. Current plans call for implementation testing in 2023 and onboarding the first set of EDAM participants in early 2024. These changes would aim to improve renewable integration and market efficiency through day-ahead scheduling and unit commitment across a larger area for expanded regional activity in the extended day ahead market that may not require governance changes of the CAISO.

*SB 100 Report.* In 2018, the Legislature established the policy that all of the state's retail electricity be supplied with a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100 percent clean energy. It additionally required the CPUC, in consultation with the California Energy Commission (CEC), California Air Resources Board (CARB), and all California BAs, to issue a joint report to the Legislature by January 1, 2021, reviewing and evaluating the 100 percent clean energy policy (*Joint Agency SB 100 Report: Achieving 100 Percent Clean Electricity in California: an Initial Assessment*, March 2021). While energy planning has historically focused on what energy mix is best suited to meet our greenhouse gas (GHG) and reliability goals 10 years into the future, the Joint Agency SB 100 Report looks at a planning horizon 23 years out, to determine how best to implement the 100 percent clean energy policy enacted under SB 100 (De León, Chapter 312, Statutes of 2018). The first SB 100 report included analyses of many pathways to achieve the state's 2045 clean energy goal, including acknowledgment that regional coordination would be “a key component of

*California's strategy to realize its renewable energy and GHG emission reduction goals."* The report notes the need for continued studies, in general, and the numerous approaches to western coordination, including EIM, EDAM, WECC, and others, without explicit mention of a regionalized RTO. The SB 100 Report will be updated every four years, with future work focused on system reliability, among other considerations.

## Comments

*ACR 188.* This measure would request the CAISO, in consultation with BANC, Imperial Irrigation District, Los Angeles Department of Water and Power, and Turlock Irrigation District balancing authorities, to provide a report that summarizes the relevant studies, including those specified, on the impacts of expanded regional cooperation on California and identifies key issues that will most effectively advance the state's energy and environmental goals.

*Need to include transmission costs and reliability in the report.* As noted by the California Municipal Utilities Association (CMUA), the measure should be strengthened to include information related to transmission costs and impacts to electric grid reliability. Given the recent August 2020 rotating outages, continued concerns about electric grid reliability, and increasing concerns about transmission costs, CMUA's interest to ensure these aspects of regional coordination are included in the report are compelling. *Therefore, the author and committee may wish to amend this measure to incorporate any studies that impact transmission costs and/or reliability for California ratepayers.*

*Timing.* The measure would request this information of the CAISO and the state's BAs by February 2023. Given the need for the CAISO to coordinate with the other BAs additional time and a specific date may be beneficial to the request. However, the author's staff has noted that the CAISO suggested by February 28 is sufficient time to provide the requested report. *As such, the author and committee may wish to amend the bill to add February 28, 2023 as the date by when the requested report should be provided.*

*Need for minor technical amendments.* As noted above the SB 100 Joint Agency Report identified the need for continued studies. As such, while the initial findings of the report should help inform planning, they must also be considered in the context of forecasts and modeling and related assumptions that will need continued studies. *As such, the author and committee may wish to amend this measure to*



*reflect the uncertainties of the findings of the SB 100 Joint Agency Report by stating the findings as procurement that may be needed by 2040.*

### **Prior/Related Legislation**

AB 813 (Holden, 2018) would have delegated to the CEC the ability to authorize the transformation of the CAISO into a multistate regional transmission system, if specified requirements are satisfied. The bill died in the Senate Committee on Appropriations.

SB 726 (Holden, 2017) included three distinct, largely unrelated components, one of which establishes a process to authorize transformation of the CAISO into a regional organization. The bill was held in the Committee on Senate Rules.

SB 350 (De Leon, Chapter 547, Statutes of 2015) among other things, established targets to increase retail sales of renewable electricity to 50 percent by 2030, states the intent of the Legislature to provide for the regionalization of CAISO, and requires statutory authorization of such regionalization.

**FISCAL EFFECT:** Appropriation:      Fiscal Com.:      No      Local:

### **SUPPORT:**

Advanced Energy Economy  
 American Clean Power – California  
 Apex Clean Energy  
 Avangrid Renewables  
 Bay Area Council  
 Balancing Authority of Northern California  
 California Chamber of Commerce  
 California Environmental Voters  
 California Municipal Utilities Association, if amended  
 Ceres  
 Clean Energy Buyers Alliance  
 Clean Power Campaign  
 Cypress Creek Renewables  
 EDF Renewables  
 EDP Renewables North America LLC  
 Enel North America, Inc.  
 Enel X North America, Inc.  
 Environmental Defense Fund  
 Environmental Entrepreneurs

Independent Energy Producers  
Los Angeles Business Council  
Natural Resources Defense Council  
NRG  
Pacific Gas & Electric Company  
Pattern Energy  
Revolve Renewable Power Corp.  
San Diego Gas & Electric  
Solar Energy Industries Association  
Southern California Edison  
Silicon Valley Leadership Group  
Turlock Irrigation District  
Union of Concerned Scientists  
Vote Solar

**OPPOSITION:**

None received

**ARGUMENTS IN SUPPORT:** In support of this measure, the Advanced Energy Economy and the numerous related companies express support to ensure California moves forward with an expanded regional market to help the state achieve its clean energy goals. AEE and related companies state:

California is in the midst of implementing landmark climate and clean energy goals. The entire West is grappling with the impacts of extreme weather events and catastrophic fires that exacerbate the need for a diverse, reliable, resilient power system. California is not alone in the need to harden and expand its grid infrastructure, rapidly lower greenhouse gas and criteria air pollutant emissions, and reduce ratepayer costs.

We cannot afford to be left behind as the rest of the West works to enhance and forge regional solutions to achieve state goals and strengthen reliability across the system. ACR 188 will inform thoughtful conversation by providing the state with a better understanding of existing regional efforts around shared priorities.

**-- END --**