Date of Hearing: May 18, 2022

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY
Eduardo Garcia, Chair
ACR 188 (Holden) – As Introduced May 2, 2022

SUBJECT: Independent System Operator: regional cooperation: study

SUMMARY: Requests that the California Independent System Operator (CAISO) produce a report by February 2023 to summarize recent studies on the impacts on California of an expanded regional grid and to identify key issues that will advance the state's energy and environmental goals. The report shall include updates to estimates used in the Senate Bill 100 (De León, Chapter 312, Statutes of 2018) Joint Agency Report, as well as discuss regional transmission organizations in—and further collaboration with—other western states.

EXISTING LAW:

1) Establishes that U.S. Federal Energy Regulatory Commission (FERC) has 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 the 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 transforms 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) Establishes the policy that all of the state's retail electricity be supplied with a mix of Renewables Portfolio Standard (RPS)-eligible and zero-carbon resources by December 31, 2045, for a total of 100% clean energy. Requires the California Public Utilities Commission (CPUC), in consultation with the California Energy Commission (CEC), the California Air Resources Board (CARB), and all California balancing authorities (BAs), to issue a joint report to the Legislature by January 1, 2021, reviewing and evaluating the 100% clean energy policy. (Public Utilities Code § 454.53)

8) Requires the CPUC and CEC, in consultation with CARB, to take steps to ensure that a transition to a zero-carbon electric system for the state does not cause or contribute to greenhouse gas (GHG) emissions increases elsewhere in the western grid. Requires the CPUC, CEC, CARB, and all other state agencies to incorporate that policy into all relevant planning, and to use programs authorized under existing statutes to achieve that policy. (Public Utilities Code § 454.53)

9) Defines "eligible renewable energy resource" as an electrical generating facility that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts (MW) or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, subject to multiple conditions. (Public Utilities Code § 399.12)

10) Requires retail sellers and publicly owned utilities to increase purchases of renewable energy such that at least 60% of retail sales are procured from eligible renewable energy resources by December 31, 2030. This is known as the RPS. (Public Utilities Code § 399.11 et seq.)

FISCAL EFFECT: Nonfiscal.

BACKGROUND:

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 lower-voltage distribution system. The United States electric power system in the Lower 48 states is made up of three main alternating current grids or "interconnections," which operate largely independently from each other:

- The Western Interconnect – the area west of the Rocky Mountains, stretching north into Canada and south to Baja California in Mexico, consists of 38 BAs. All electric utilities in the Western Interconnect are electrically tied together during normal system conditions

and operate at a synchronized frequency of 60 hertz (Hz). BAs within the Western Interconnect include the CAISO, the Balancing Authority of Northern California (BANC), Los Angeles Department of Water and Power, the Turlock Irrigation District, and the Imperial Irrigation District, as well as several outside California. Generation capacity of the Western Interconnect makes up approximately 20 percent of all capacity in the United States and Canada.

- The Eastern Interconnect – the area east of the Rockies and a portion of northern Texas, which consists of 36 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 ensuring bulk power system reliability in their respective footprints. The 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 (ISOs) 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.

BAs – The actual operation of the electric system is managed by entities called BAs. A "balancing authority" is responsible for managing the transmission of high-voltage electricity across long-distance transmission lines. 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 system-wide blackouts. BAs also must manage transfers of electricity with other BAs. The NERC issues mandatory reliability standards for BAs which are approved by the FERC. Most BAs are electric utilities that have taken on the balancing responsibilities for a specific portion of the power system; however in some regions, utilities join RTOs/ISOs that function as BAs for their designated area.

RTOs/ISOs – Nine RTOs/ISOs operate bulk electric power systems across much of North America. RTOs/ISOs are independent, membership-based, nonprofit organizations that ensure reliability and optimize supply and demand bids for wholesale electric power. RTOs/ISOs first developed in the 1990s to accommodate FERC policy encouraging competitive generation and open access to transmission. RTOs/ISOs dispatch power by feeding both day-ahead and real-time bids 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. RTOs/ISOs have different types of members, including: independent generators, transmission companies, load-serving entities, integrated utilities that combine generation, transmission and distribution functions, and power marketers and energy traders. RTOs/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.

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% 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 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 by California's governor with confirmation by the state Senate.

CASIO's 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 that trades the difference between the day-ahead forecast of power and the actual amount of energy needed to meet demand in each hour. It launched in 2014, and currently involves 19 participants across 10 western states. By 2023, when another three participants are slated to join the EIM, it will serve approximately 79% of the WECC total load.[1] 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.

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% clean energy. It additionally required the CPUC, in consultation with the CEC, CARB, and all California balancing authorities, to issue a joint report to the Legislature by January 1, 2021, reviewing and evaluating the 100% clean energy policy. (Joint Agency SB 100 Report)[2]

While energy planning has historically focused on what energy mix is best suited to meet our 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% clean energy policy enacted under SB 100 (De León, Chapter 312, Statutes of 2018).[3] The first SB 100 report was finalized in March 2021, and included analyses of many pathways to achieve the state's 2045

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[1] California ISO, "Western Energy Imbalance Market FACT SHEET," April 2022, https://www.westerneim.com/Documents/WEIM-2-Billion-in-Benefits-Fact-Sheet.pdf
[2] Public Utilities Code § 454.53
[3] CEC, CPUC, & CARB; *2021 SB 100 Joint Agency Report: Achieving 100 Percent Clean Electricity in California: An Initial Assessment*;" March 2021.

clean energy goal,[4] 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 SB 100 Report will be updated every four years, with future work focused on system reliability,[5] among other considerations.

COMMENTS:

1) *Author's Statement.* According to the author, "In 2015, as part of SB 350, the Legislature expressed its intent to "provide for the evolution 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." This effort was commonly referred to as regionalization. SB 350 also required the CAISO to study the "impacts of a regional market…including overall benefits to ratepayers, including the creation or retention of jobs and other benefits to the California economy, environmental impacts in California and elsewhere, impacts in disadvantaged communities, emissions of greenhouse gases and other air pollutants, and reliability and integration of renewable energy resources."

   The study was done and found considerable potential for additional benefits for California consumers through an expanded CAISO. The issue of regionalization was debated in 2018 but did not move forward. Since that time, states across the west and utilities have adopted their own policies to achieve a clean resource mix and reduce greenhouse gas emissions, which are generally consistent with the policy direction of California. Two states have mandated participation in a west-wide market.

   As tens of thousands of megawatts of renewable resources are slated for development in the west and thousands of megawatts of coal-fired resources are retired and continue to be shut down, momentum is building for greater regional coordination to ensure that electricity is available at all hours of the day, including peak and net-peak to replace retired and retiring generating facilities and meet future electrification reliability needs of a carbon neutral economy with affordable costs.

   Consequently, I think it's time for California to revisit a broader regional market. This resolution does not do that but it does ask the CAISO to update the SB 350 study and to assess other research and studies on the impacts of a west-wide market and report back to the Legislature next year. Just a study and a report…nothing more at this time."

2) *SB 350 Studies*. In passing SB 350 (De León, Chapter 547, Statutes of 2015), the Legislature expressed its intent that CAISO expand into a regional body that would manage high-voltage electricity transmission for entities throughout the Western Interconnect, a process colloquially known as regionalization. SB 350 directed 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 was the completion of studies (SB 350 Studies) on the effects of

[4] Pg. 12, *2021 SB 100 Report.*
[5] Pg. 1, *2021 SB 100 Report.*

regionalization on ratepayers, the environment, disadvantaged communities, and safety and reliability.[6]

CAISO completed the SB 350 Studies in 2016, finding, among other things, that by 2030 regionalization could benefit California ratepayers with $1 billion to $1.5 billion annually.[7] Additionally, the Studies found that regionalization would result in:

- Approximately 3-4 million metric tons of CO_2 reduction;
- Creation of 9,900 to 19,300 additional California jobs;
- Increased efficiency in renewable energy development, and a subsequent reduction in land use, biological resources, and water use impacts;
- Improved integration of renewables, leading to maintaining reliability at reduced cost and reducing the need for curtailment of resources.

The SB 350 Studies acknowledged these findings are impacted significantly if the size of the regional market studied changes, and the benefits would increase significantly if the state's renewable generation mandates were accelerated.[8] Since the SB 350 Studies were published, the Legislature adopted SB 100 (De León, Chapter 312, Statutes of 2018) which increased the statewide RPS requirement from 50% by 2030 to 60% and created the policy of planning to meet all of the state's retail electricity supply with a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100% clean electricity. This resolution seeks an update of the SB 350 Studies to include, among other considerations, the estimates for the electric grid used in the SB 100 Joint Agency Report.

3) *Developments out West.* In the six years since the SB 350 Studies were released, much activity has happened in the Western Interconnect related to clean energy mandates and engagement on enhanced regional coordination.[9] As demonstrated in Table 1 below, many western states have moved toward cleaner energy policies, creating opportunities for increased coordination and market development that might take advantage of the geographic diversity of loads and resources.

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[6] Public Utilities Code § 359.5(e)(1) – "*The Independent System Operator conducts one or more studies of the impacts of a regional market enabled by the proposed governance modifications, including overall benefits to ratepayers, including the creation or retention of jobs and other benefits to the California economy, environmental impacts in California and elsewhere, impacts in disadvantaged communities, emissions of greenhouse gases and other air pollutants, and reliability and integration of renewable energy resources. The modeling, including all assumptions underlying the modeling, shall be made available for public review."*

[7] Pg. I-viii; CAISO, "Senate Bill 350 Study: The Impacts of a Regional ISO-Operated Power Market on California, Executive Summary," July 8, 2016, https://www.caiso.com/informed/Pages/RegionalSolutions.aspx

[8] Pg. I-xiv; CAISO, "Senate Bill 350 Study: The Impacts of a Regional ISO-Operated Power Market on California, Executive Summary," July 8, 2016, https://www.caiso.com/informed/Pages/RegionalSolutions.aspx

[9] 100% Clean Energy Collaborative – Table of 100% Clean Energy States, https://www.cesa.org/projects/100-clean-energy-collaborative/guide/table-of-100-clean-energy-states/, accessed last on 05.14.2022.

Figure 1: 2030 Clean Energy or RPS Targets[10]

State	**2030 Target** (% of annual energy)
Arizona	38% RPS
California	60% RPS
Colorado	31% RPS
Idaho	55% Clean
Montana	18% Clean
Nevada	50% RPS
New Mexico	50% RPS
Oregon	27% RPS
Utah	31% Clean
Washington	80% Clean
Wyoming	No RPS

Additionally, at the time of the SB 350 Report, interest outside of California for more regional collaboration was unclear. The CAISO's EIM was only two years old with just a few utilities participating or interested.[11] Today, the EIM has 19 participants across 10 western states and Canada. By 2023, when another three participants are slated to join the EIM, it will serve approximately 79% of the WECC total load.[12]

In 2021 Colorado and Nevada independently adopted legislation mandating their utilities join regional transmission operators.[13] The federal Department of Energy also funded a study, led by the State of Utah, to evaluate market expansion options while enhancing regional dialog.[14] This resolution requests CAISO to evaluate these western-wide changes that have arisen since the SB 350 Studies.

4) *Do Concerns Persist?* In 2016, the results of the SB 350 Studies were not universally embraced. As required by law, state regulators held public hearings on the SB 350 Studies. Legislative staff organized many 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. These concerns only increased after the presidential election in 2016. As a result, legislation to regionalize the CAISO stalled.[15]

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[10] Pg. 13, Energy Strategies, Project Contractor; "The State-Led Market Study; Technical Report; ROADMAP," July 30, 2021.
[11] Chiefly Pacificorp, headquartered in Portland, Oregon.
[12] California ISO, "Western Energy Imbalance Market FACT SHEET," April 2022, https://www.westerneim.com/Documents/WEIM-2-Billion-in-Benefits-Fact-Sheet.pdf
[13] Colorado Senate Bill 72, Statutes of 2021 and Nevada Senate Bill 448, Statutes of 2021.
[14] Pg. 2, Energy Strategies, Project Contractor; "The State-Led Market Study; Technical Report; ROADMAP," July 30, 2021.
[15] AB 813, Holden, 2018.

However, in the six years since the SB 350 Studies were concluded, changes have occurred in both federal and western state energy policies, as discussed above. Moreover, electricity costs are increasing throughout California leading to renewed interest in policies that may lead to greater efficiency and a reduction in consumer cost. This resolution does not wade into the contentious issues raised previously, but rather seeks to provide the Legislature with an update to the six-year-old SB 350 Studies. This resolution requires the update to the Studies be conducted on a fairly aggressive timeline—under a year—in order to provide the most current research and data to the Legislature, should this body decide to revisit the concept of regionalization.

Utility stakeholders have raised concerns about specific topics not expressly included in the resolution, particularly surrounding transmission cost and grid reliability considerations.[16] This resolution is broad in its terms, detailing that the updated CAISO report summarize recent studies on the impacts of expanded regional cooperation and key issues that will most effectively advance the state's goals. Considerations of cost and reliability seem well within the scope of "impacts" and "key issues," and recent studies of regionalization have included them.[17]

5) *Related Legislation.*

SB 1032 (Becker) *as recently amended,* mandates the CPUC, in consultation with a number of agencies, to conduct a study to be submitted to the Legislature by January 1, 2024, on how to accelerate the development of, and reduce the cost of expanding, the state's electrical transmission grid. The report is due on January 1, 2024. Status: Senate – In Committee Process – Appropriations.

6) *Previous Legislation.*

SB 100 (De León) establishes the 100 Percent Clean Energy Act of 2018 which increases the RPS requirement from 50% by 2030 to 60% and creates the policy of planning to meet all of the state's retail electricity supply with a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100% clean energy. Requires the CPUC, in consultation with the CEC, CARB, and all California balancing authorities, issue a joint report to the Legislature by January 1, 2021, reviewing and evaluating the 100% clean energy policy. Status: Chapter 312, Statutes of 2018.

AB 813 (Holden, 2018) would have established a pathway for the CAISO to transform its governance structure to operate as a multistate regional transmission system organization should certain requirements be met. Status: Died – Senate Committee on Rules.

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[16] See letter from California Municipal Utilities Association, dated May 13, 2022.
[17] Brown and Botterud. "The Value of Inter-Regional Coordination and Transmission in Decarbonizing the US Electricity System." *Joule,* Vol 5, Issue 1. 2020. DOI: 10.1016/j.joule.2020.11.013

AB 726 (Holden, 2017) includes three distinct, largely unrelated components, one of which establishes a process to authorize transformation of the CAISO into a regional organization. Status: Died – Senate Committee on Rules.

SB 350 (De León) among other provisions, states the intent of the Legislature to provide for the regionalization of CAISO, requires statutory authorization of such regionalization, and makes regionalization contingent upon—among other things—the CAISO conducting one or more studies on the impacts of a regional market. Status: Chapter 547, Statutes of 2015.

REGISTERED SUPPORT / OPPOSITION:

Support

Advanced Energy Economy
American Clean Power Association
Apex Clean Energy
Avangrid Renewables
Balancing Authority of Northern California
Bay Area Council
California Chamber of Commerce
California Environmental Voters (formerly CLCV)
Ceres
Clean Energy Buyers Alliance
Clean Power Campaign
Cypress Creek Renewables
EDF Renewables
Edison International and Affiliates, Including Southern California Edison
EDP Renewables North America LLC
Enel North America
Enel X
Environmental Defense Fund
Environmental Entrepreneurs
Independent Energy Producers Association
Los Angeles Business Council
Natural Resources Defense Council
NRG Energy
Pattern Energy
Revolve Renewable Power Corp
Silicon Valley Leadership Group
Solar Energy Industries Association
Turlock Irrigation District
Union of Concerned Scientists
Vote Solar

Support If Amended

California Municipal Utilities Association

Opposition

None on file.

Analysis Prepared by: Laura Shybut / U. & E. / (916) 319-2083