

Date of Hearing: April 6, 2022

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY

Eduardo Garcia, Chair

AB 2587 (Eduardo Garcia) – As Amended March 28, 2022

SUBJECT: Energy: firm renewable energy resources and firm zero-carbon resources: procurement

SUMMARY: Expands the type of firm resources to be considered in an upcoming California Energy Commission (CEC) assessment, and requires the California Public Utilities Commission (CPUC) to open a proceeding related to the procurement of these resources based on the findings of the CEC assessment. Specifically, **this bill:**

- 1) Adds “firm renewable energy resources” as an additional resource type for the CEC to consider in their assessment of firm resources.
- 2) Requires the CPUC to open a new proceeding or new phase of an existing proceeding related to the procurement of firm renewable energy resources or firm zero-carbon resources (“firm resources”) based on the findings and recommendations made in the CEC assessment.
- 3) Requires the CPUC proceeding to take place no later than six months from the time the CEC assessment is presented to the Legislature.
- 4) Requires the CPUC to consider whether to increase the procurement of firm resources during any year, but specifically during 2027 to 2040. As part of the consideration, the CPUC shall take into account:
 - a. The need to ensure reliable energy supply over multiday extreme or atypical weather events, periods of low renewable energy generation, and deenergization events to mitigate wildfires in a manner consistent with the state’s policies of integrated resources planning (IRP) and 100% clean energy by 2045.
 - b. The overall electrical system costs and opportunities to lower long-term system costs through the commercialization of new and diverse firm resources.
 - c. The impacts and benefits of firm resources on greenhouse gas (GHG) emissions, air quality, economic development, land use, minimized renewable energy curtailment, avoided transmission needs or upgrades, and other ratepayer and social benefits.
 - d. The opportunities for firm resources to enable the retirement of natural gas generation and the retirement or avoidance of other natural gas infrastructure, including pipelines and storage wells, while preserving both system and local reliability, including during multiday periods of extreme or atypical weather.
 - e. The magnitude of potential long-term needs for, and the role of, firm resources.

- f. The potential mechanisms to ensure the commercialization of a variety of firm resources that maximize benefits to the electrical grid and further the state's climate, air quality, economic development, and clean energy policies.
 - g. The specific barriers that new energy resource technology classes such as long-duration energy storage and multiday energy storage face in achieving initial commercial market entry and expansion.
 - h. The need to provide stable but flexible investment signals to stimulate resource and economic development over time.
- 5) Makes a number of findings and declarations related to the need for firm resources.

EXISTING LAW:

- 1) Requires the CEC to submit to the Legislature an assessment by December 31, 2023, of firm zero-carbon resources that support a clean, reliable, and resilient electrical grid and will help achieve the existing statutory goal of ensuring renewable energy and zero-carbon resources supply 100 percent of all retail sales of electricity to California customers by December 31, 2045. (Public Resources Code § 25216.7)
- 2) Defines “firm zero-carbon resources” as electrical resources that can individually, or in combination, deliver zero-carbon electricity with high availability for the expected duration of multiday extreme or atypical weather events, including periods of low renewable energy generation, and facilitate integration of eligible renewable energy resources into the electrical grid and the transition to a zero-carbon electrical grid. (Public Resources Code § 25216.7 (d)(2))
- 3) 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 CPUC, in consultation with the CEC, the California Air Resources Board (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. (Public Utilities Code § 454.53)
- 4) 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 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. Requires the CPUC, CEC, and CARB to use programs authorized under existing statutes to achieve that policy. (Public Utilities Code § 454.53)
- 5) 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)
- 6) Defines “load-serving entities” (LSE) as investor-owned utilities (IOUs), electric service providers, and community choice aggregators. (Public Utilities Code § 380 (k))

- 7) Requires the CPUC to adopt a process for each LSE serving end-use customers in the state to file an IRP and schedule periodic updates to the plan to ensure that LSEs accomplish specified objectives. Requires each LSE to prepare and file an IRP consistent with those objectives on a time schedule directed by the CPUC and subject to CPUC review. (Public Utilities Code § 454.52)
- 8) Requires that the IRP of each LSE contribute to a diverse and balanced portfolio of resources needed to ensure a reliable electricity supply that provides optimal integration of renewable energy resources in a cost-effective manner, meets the emissions reduction targets for GHG emissions established by CARB for the electricity sector, and prevents cost-shifting among LSEs. (Public Utilities Code § 454.54)
- 9) 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.)
- 10) Requires the CEC to adopt the IEPR every two years, which must contain an overview of major energy trends and issues facing the state, including, but not limited to, supply, demand, pricing, reliability, efficiency, and impacts on public health and safety, the economy, resources, and the environment. (Public Resources Code §§ 25300-25327)
- 11) Requires the CEC to timely incorporate firm zero-carbon resources into the IPER. (Public Resources Code § 25305.5)

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

BACKGROUND:

Firm Power and SB 423 – “Firm power” generally refers to electricity resources that can deliver electricity at any time, for as long as needed.¹ An alternative term for this is “baseload” resources, which may include anything from fossil fuel plants (coal, biomass, natural gas, etc.) to nuclear energy to geothermal or hydropower. These firm power resources can supply power even when variable resources – such as solar and wind – are offline (such as at night or on cloudy days). Much of the firm power currently in use in California is from natural gas.² With California moving towards a 100% clean energy future, and on the eve of closing its last remaining nuclear plant at Diablo Canyon, other sources of firm power are likely necessary to maintain system reliability.

Recent studies have highlighted the need for clean firm power to contribute to this future.³ The studies suggest clean firm power can provide reliability benefits at long-term cost savings over an all-variable renewable portfolio. However, the studies raise concerns that California is not

¹ Long, JCS, et al., “Clean Firm Power is the Key to California’s Carbon-Free Energy Future,” *Issues in Science and Technology*, March 24, 2021.

² Roughly 42 MW; Long, JCS, et al. “Clean Firm...,” *Issues*.

³ Long, JCS, et al. “Clean Firm...,” *Issues* (citation 1), and E3, “Long-Run Resource Adequacy under Deep Decarbonization Pathways for California,” June 2019;

adequately preparing these resources for future procurement, as these resources have long-lead times to development and are often more expensive than variable renewables (solar and wind).⁴

Recognizing these concerns, last year the Legislature adopted SB 423 (Stern, Chapter 243, Statutes of 2021) which requires the CEC to submit by December 31, 2023, an assessment of firm zero-carbon resources that support a clean, reliable, and resilient electrical grid. SB 423 provided a statutory definition of “firm zero-carbon resources” as electrical resources that can individually, or in combination, deliver zero-carbon electricity with high availability for the expected duration of multiday extreme or atypical weather events, including periods of low renewable energy generation, and facilitate integration of eligible renewable energy resources into the electrical grid and the transition to a zero-carbon electrical grid. This definition might apply to a variety of generation and storage technologies, both known and nascent, from geothermal to green electrolytic hydrogen to long-duration storage.

Planning for the Future: the IRP, SB 100, and IEPR – California has a complicated but robust electric planning and procurement regime spread across the CPUC, CEC, and CAISO. This regime guides the current procurement the LSEs conduct, and informs mid- and long-term procurement strategies. The regime is complementary, where one resource may count toward meeting many facets of an LSE’s procurement requirements and planning goals. The main pieces of the regime are the IRP, the related SB 100 Report, and the IEPR.

The IRP – Since 2015, with the passage of SB 350 (De León, Chapter 547, Statutes of 2015), California regulators have worked to identify a diverse mix of resources to achieve our clean energy goals. SB 350 requires the CPUC to adopt a process for each LSE to file an IRP starting in 2017 and for each publicly-owned utility (POU) to file an IRP by January 1, 2019. The goal of the IRP is to reduce the cost of achieving GHG emission reductions by looking broadly at system needs, rather than at individual LSEs or resource types, in order to identify generation that reduces GHGs, improves reliability, and reduces overall cost.

The IRP operates on a 2-year planning cycle, and forecasts system needs 10 years into the future. The most recent IRP analysis identified almost 20 gigawatts (GW) of new resources needed by 2031, arising from a mix of geothermal, land-based wind, solar, battery storage, and long-duration storage resources.⁵ The CPUC also conducts sensitivity analyses for the IRP for emerging resources whose pricing data and availability are not robust enough for inclusion as a main resource, but whose sensitivity analysis can provide more insight into how the technology may contribute to the overall portfolio. Recent IRP sensitivities have examined offshore wind⁶ and hydrogen.⁷

SB 100 Report – While the IRP focuses 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

⁴ Long, JCS, et al. “Clean Firm...,” *Issues*.

⁵ 38 MMT scenario resource stack; CPUC, “Proposed Resource Planning Portfolios from CPUC’s Integrated Resource Planning Process for use in CAISO’s 2021-2022 Transmission Planning Process,” January 20, 2021, pg. 9.

⁶ Pg. 26, D. 21-02-008, *Decision Transferring Electric Resource Portfolios to California Independent System Operator for 2021-2022 Transmission Planning Process*; R. 20-05-003; issued February 17, 2021.

⁷ Pg. 13, D. 20-03-028, *2019-2020 electric Resource Portfolios to Inform Integrated Resource Plans and Transmission Planning*, R. 16-02-007, issued on April 6, 2020.

under SB 100 (De León, Chapter 312, Statutes of 2018).⁸ The first SB 100 report was finalized in March 2021, and included analyses of many pathways to achieve the state's 2045 clean energy goal, including a core scenario that selected offshore wind resources and long-duration storage, as well as study scenarios examining “zero-carbon firm resources.”⁹ These additional studies examined a representative firm zero-carbon resource (with assumed estimated price and availability data for the non-specific, generic resource), and found roughly 15 gigawatts of the resource were selected reducing the overall need for utility-scale solar and battery storage by \$2 billion.¹⁰ The SB 100 Report will be updated every four years, with future work focused on system reliability,¹¹ among other considerations.

The IEPR – Alongside the IRP and SB 100 Report, which focus on potential mid- and long-term procurement needs for the electricity system, the CEC conducts an IEPR to forecast all aspects of energy industry supply, production, transportation, delivery, distribution, demand, and pricing. The CEC is then required to use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety. The CEC adopts an IEPR every two years with updates every other year. The information generated from the IEPR's demand forecast informs the IRP process at the CPUC.

COMMENTS:

- 1) *Author's Statement.* According to the author, “California has made significant strides towards a clean energy future but more work is ahead as we face the threat of climate change. The SB 100 joint agencies report highlighted the need for more substantial investments in new and existing technologies, and included scenarios with up to 15 GW of firm renewable energy and zero carbon resources. This report also underscores the importance of these resources that can significantly reduce energy resource needs, costs, and emissions associated with meeting SB 100 goals. Other reports have also found that increasing a diverse portfolio of firm renewable and zero carbon resources will reduce overall system costs by as much as two-thirds compared to scenarios without them. AB 2587 encourages the continued operation and development of new firm renewable energy and zero carbon resources that are known to add reliability and diversity to our electrical grid while also providing co-benefits to the environment and economies of some of our state's most disadvantaged communities.”
- 2) *The Missing Renewables.* This bill expands upon efforts adopted under SB 423 (Stern, Chapter 243, Statutes of 2021) which calls for the CEC to assess the need for firm zero-carbon resources that support a clean, reliable, and resilient electrical grid. The definition of zero-carbon resources used in SB 423 excludes some RPS-eligible renewable resources. These renewables—such as biomass, digester gas, and municipal solid waste conversion—are not considered “zero-carbon” as they emit CO₂ when combusted to generate electricity. This bill adds “firm renewable resources” to the types of resources to

⁸ CEC, CPUC, & CARB; 2021 *SB 100 Joint Agency Report: Achieving 100 Percent Clean Electricity in California: An Initial Assessment*,” March 2021.

⁹ Pg. 12, 2021 *SB 100 Report*.

¹⁰ Pg. 13, 2021 *SB 100 Report*.

¹¹ Pg. 1, 2021 *SB 100 Report*.

be considered in the CEC assessment, aligning this statute with the state's SB 100 goals¹² and the CPUC recent mid-term reliability decision.¹³

- 3) *The Place for Procurement.* This bill requires the CPUC to take the findings from the CEC's firm resources assessment and open a new proceeding or new phase of an existing proceeding related to firm resource procurement. The supporters of this bill note that while state energy planning efforts focus on decarbonization and cost-effectiveness, there is a lack of planning around firm resources, and that firm resources deserve distinct consideration given their unique attributes compared to intermittent renewables or short duration storage.

Efforts at the CPUC seem to echo these considerations, where the CPUC recently issued a procurement decision within their IRP proceeding calling for 1,000 MW of long-duration storage and 1,000 MW of firm resources¹⁴ as part of an 11,500 MW order of resources to come online by 2026.¹⁵

This all suggests that the state is moving to recognize the challenges faced to meet reliability. While the CPUC's mid-term reliability procurement order was a first step, the author notes that many of these firm resources take a long time to come online so their procurement should be considered sooner. Given that the CPUC already has a long-standing procurement effort in the IRP, *the committee may wish to consider requiring the CPUC to include the firm resource recommendations in their IRP process rather than in a new proceeding.*

- 4) *Prior Legislation.*

SB 423 (Stern) requires the CEC to submit to the Legislature an assessment by December 31, 2023, of firm zero-carbon resources that support a clean, reliable, and resilient electrical grid and will help achieve the existing statutory goal of ensuring renewable energy and zero-carbon resources supply 100 percent of all retail sales of electricity to California customers by December 31, 2045. Status: Chapter 243, Statutes of 2021.

SB 100 (De León) establishes the 100 Percent Clean Energy Act of 2018 which increases the Renewables Portfolio Standard (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,

¹² Which permits a mix of RPS-eligible and zero-carbon resources by December 31, 2045.

¹³ Where half the procurement of eligible resources could be from zero-emitting or "those that otherwise qualify as eligible under the RPS program and have at least an 80 percent capacity factor." Pg. 3, CPUC D. 21-06-035, "Decision Requiring Procurement to Address Mid-term Reliability (2023-2026)," R. 20-05-003, filed June, 30, 2021.

¹⁴ Not defined as such, but rather resources that must have no on-site emissions (or are RPS eligible), have at least an 80% capacity factor, and be available continuously during the evening peak and all weathers.

¹⁵ CPUC, D.21-06-035, "Decision Requiring Procurement to Address Mid-term Reliability (2023-2026)," R. 20-05-003, filed June, 30, 2021.

reviewing and evaluating the 100% clean energy policy. Status: Chapter 312, Statutes of 2018.

SB 350 (De León), among its many provisions, requires the CPUC to adopt a process for each LSE to file an IRP starting in 2017 and updating periodically. Additionally requires POU's to file an IRP by January 1, 2019. Status: Chapter 547, Statutes of 2015.

- 5) *Double Referral*. This bill is double-referred; upon passage in this Committee, this bill will be referred to the Assembly Committee on Natural Resources.

REGISTERED SUPPORT / OPPOSITION:**Support**

Bioenergy Association of California
Bloom Energy
Fervo Energy
Form Energy
Independent Energy Producers Association
Microgrid Resources Coalition
Olin Strategies
True North Renewable Energy

Opposition

None on file.

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