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**SENATE COMMITTEE ON ENVIRONMENTAL QUALITY**

**Senator Allen, Chair**

**2021 - 2022 Regular**

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**Bill No:** SB 423  
**Author:** Stern  
**Version:** 4/19/2021  
**Urgency:** No  
**Consultant:** Eric Walters

**Hearing Date:** 4/26/21  
**Fiscal:** Yes

**SUBJECT:** Energy: renewable and zero-carbon resources

**DIGEST:** Integrates emerging renewable energy and firm zero-carbon resources, as defined, into a number of recommendations, planning documents, and proceedings, including the Air Resources Board's (ARB's) scoping plan update, the California Public Utilities Commission's (CPUC) resource adequacy requirements, among others.

**ANALYSIS:**

Existing law:

- 1) Establishes the 100 Percent Clean Energy Act of 2018 as a policy of the state that eligible renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. (Public Utilities Code (PUC) §454.53)
- 2) Requires the California Public Utilities Commission (CPUC) and State Energy Resources Conservation and Development Commission (CEC), in consultation with the State Air Resources Board (ARB), to take steps to ensure that a transition to a zero-carbon electric system for the State of California does not cause or contribute to greenhouse gas (GHG) emissions increases elsewhere in the western grid. Requires the CPUC, CEC, and ARB, and all other state agencies to incorporate that policy into all relevant planning. Requires the CPUC, CEC, and ARB to use programs authorized under existing statutes to achieve that policy. (PUC §454.53)
- 3) Requires ARB to prepare and approve a scoping plan to achieve maximum technologically feasible and cost-effective reductions in GHG emissions at least once every five years, as specified. (HSC §38561)
- 4) Requires, as part of the Clean Energy and Pollution Reduction Act (SB 350, De Leon, 2015), load serving entities (LSEs) to submit Integrated Resource Plans

(IRPs) which first determine the appropriate GHG emissions planning target for the electric sector and identify an optimal resource mix that meets state GHG emissions and reliability goals at least cost. (PUC §454.51 et seq.)

This bill:

- 1) Makes findings and declarations regarding the need to accelerate deployment of emerging renewable and zero-carbon resources that can provide firm baseload or firm flexible electricity, including green electrolytic hydrogen, new long-duration and multi-day storage resources and geothermal and offshore wind resources.
- 2) Tasks ARB with incorporating emerging renewable energy and firm zero-carbon resources, as defined, into its energy and resource planning processes, including the scoping plan.
- 3) Requires the CEC, in consultation with the CPUC, CAISO, and CARB, on or before December 31, 2022, to submit to the Legislature an assessment of emerging renewable energy and firm zero-carbon resources that support a clean, reliable, and resilient electrical grid in California. This bill would require the CEC and CPUC, on or before December 31, 2022, to each adopt, and update as necessary, measures to bolster the near-, mid-, and long-term reliability and resiliency of California's electrical grid consistent with California's goals to reduce localized air pollutants and emissions of GHGs, as specified.
- 4) Tasks CEC with adopting recommendations to increase grid reliability and resiliency, consistent with California's air pollution and GHG emission reduction goals, and other stipulations.
- 5) Requires the CPUC to evaluate and analyze potential needs for emerging renewable energy and firm zero-carbon resource and technologies to contribute to a reliable, resilient, cost-effective, and clean electrical grid and integrate variable renewable energy resources into the electrical grid, to pursue opportunities to lower ratepayer costs by considering the ability of existing and emerging technologies to simultaneously address multiple reliability needs, and to establish mechanisms to encourage the stable development of emerging renewable energy and firm zero-carbon resources at a pace that is necessary to achieve both reliability needs and long-term renewable energy and zero-carbon energy goals.

- 6) Requires the CPUC, as part of establishing the resource adequacy (RA) requirements, to ensure that the RA requirements result in the LSE having sufficient resources to maintain reliable electrical service during multi-day extreme or atypical weather events and that methods used to assess the qualifying capacity of stand-alone energy storage systems or hybrid resources account for how the reliability value of those resources may vary, as specified.

## Background

- 1) *California's increasing clean energy goals.* California's ambitious renewable portfolio standard (RPS) program is jointly implemented and administered by the CPUC and the CEC. The RPS program requires the state's LSEs to procure 60 percent of their total electricity retail sales from eligible renewable energy resources by 2030, and a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100 percent clean energy. The state is well on its way to achieving its existing RPS targets. Most publically owned utilities (POUs) met 2020 goals early and are working towards their 2030 goals. The state's three largest electric utilities generally have met current procurement goals and anticipate exceeding future procurement goals, with each having procured over 40 percent eligible renewable energy resources.
- 2) *Clean firm power.* Solar and wind have become mature technologies and enjoy substantial public support. However, they present challenges because they depend on the weather, which varies in predictable and unpredictable ways. Although the costs of solar and wind power are now fully competitive with other sources per kilowatt-hour, their inescapable variability creates reliability problems. Batteries have been improving, and can help make up for fluctuations that last for multiple hours, but they cannot make up for the longer fluctuations.

“Firm power” refers to electricity-generating resources that can deliver electricity at any time, even under adverse conditions. Much of the firm power California's grid currently relies on is derived from fossil fuels, like natural gas. As California moves towards a decarbonized future and away from fossil fuels, other sources of firm power are necessary.

The examples of clean firm power provided in SB 423 include but are not limited to geothermal, offshore wind, green electrolytic hydrogen, long-duration energy storage, and multi-day energy storage. Though they differ in capacity, expense, and geographic feasibility, these sources are all carbon-free power sources that can be relied on whenever needed, for as long as they are needed. California today has 48 gigawatts of total firm power capacity, most of

which (42 gigawatts) come from natural gas-fired power plants. The remaining gigawatts come from nuclear power, geothermal, and a small amount from coal.

Expert comparisons of different energy portfolios meeting California’s clean energy goals show that a grid featuring clean firm power can provide substantial cost savings over most intermittent renewable-dependent portfolios, and even as compared to today’s energy mix. To quote a recent modeling analysis published in the National Academy of Sciences’ journal *Issues in Science and Technology*, “We don’t yet know the best choices and mixes of clean firm power. Consequently, the state should design an adaptive investment strategy—one that deploys and tests a diverse portfolio of clean firm power choices until experience identifies the best and most politically and technologically feasible options. A broad portfolio approach will increase chance of success, help to avoid technological cul-de-sacs, and thus will help ensure affordability and reliability in the long run.”

- 3) *Integrated Resource Plan and Long Term Procurement Plans (IRP-LTPP)*. Overall, the IRP-LTPP considers all of CPUC’s electric procurement policies and programs and ensures California has a safe, reliable, and cost-effective electricity supply. The proceeding is also CPUC’s primary venue for implementation of the SB 350 requirements related to IRPs. It implements a process for integrated resource planning that ensures LSEs meet targets that allow the electricity sector to contribute to California’s economy-wide GHG emissions reductions goals.

The IRP-LTPP first evaluates need based on requirements of the overall electric system, local specific needs, and the flexibility needed to integrate renewable resources. It then proceeds to procurement of electricity resources, and the plan must comply with state policies to adequately balance safety, reliability, cost, and environmental goals. If the LSE’s plan does not achieve these standards, the CPUC orders them to modify them.

- 4) *The Climate Change Scoping Plan*. ARB is statutorily required to produce and regularly update a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions from sources or categories of sources of greenhouse gases. The most recent update to the scoping plan was released in 2017 and described ARB’s integrated plan for reducing GHG emissions across all sectors of the economy to achieve the state’s SB 32 goal of annual emissions in 2030 being 40% below 1990 levels. The 2022 update is currently underway, and a draft is expected later this year.

The statutory direction provided initially under AB 32 (and upheld for SB 32) includes other specified direction, including a requirement for ARB to, “consult with all state agencies with jurisdiction over sources of GHGs, including the CPUC and CEC, on all elements of its plan that pertain to energy-related matters including, but not limited to, electrical generation, load-based standards or requirements, the provision of reliable and affordable electrical service, petroleum refining, and statewide fuel supplies to ensure the greenhouse gas emissions reduction activities to be adopted and implemented by the state board are complementary, nonduplicative, and can be implemented in an efficient and cost-effective manner.”

## Comments

- 1) *Purpose of Bill.* According to the author, “Even with such energy agency efforts that include the integrated energy policy report, (IEPR), SB 100 report, resource adequacy planning, and to some extent the scoping plan, California’s energy grid remains vulnerable to disruptive power outages that are either self-induced as part of public safety power shutoffs, or from extreme weather events. Last August, atypical weather, in the form of a western wide heat wave resulted in brief rolling-power outages administered by the ISO. In February, a mid-western wide winter storm shutdown the grid for days for much of Texas. While such weather related outages may come as a surprise to energy regulators, climate scientists have been predicating for years that extreme weather related events caused by climate change will be disruptive to societal necessities like power and water.

“However, climate change is not the only cause for increased weather-related reliability threats. As more of our electric generation supply comes from weather-dependent renewable energy resources, any atypical weather events that affect solar or wind output over broad regions can jeopardize grid reliability. Recent studies of California’s grid show that these events may shift future reliability risks from summer heat waves to multi-day winter periods of low renewable energy availability.

“The recently finalized SB 100 report is a review of various pathways to achieve 100% of electric retail sales from renewable and zero-carbon resources in California by 2045. However the report states on page 105 that it “...is intended to be a first step in an iterative and ongoing effort to assess barriers and opportunities to implementing the 100 percent clean energy policy ...”.

“My purpose is to implement SB 100 report recommendations that call for more in depth analysis on the pathways to take to achieve the goals, but to also

ensure the our state energy and climate agencies are incorporating emerging renewable energy and zero carbon energy resources into their own energy and climate plans to align with each other. We have progressed to the point given our grid vulnerabilities that it really requires our state energy and climate plans to complement each other, as it stands now, I believe there is a disconnect between objectives in several of these plans, and SB 423 is meant to ensure our state energy and climate agencies are working together in a connected fashion when examining emerging renewable and zero carbon energy resources. We can accomplish this through additional assessments, planning and recommendations, while also ensuring load serving entities have sufficient resources to maintain reliable electrical service during multi-day extreme or atypical weather events that may occur in all seasons of the year.”

- 2) *How does the scoping plan play into this?* Section 2 of this bill tasks ARB with including “emerging renewable energy and firm zero-carbon resources” into its scoping plan. The scoping plan is ARB’s central planning document for how the board plans to reduce economy-wide emissions in line with the SB 32 goals. While the electricity sector produces a large portion of the state’s emissions (and, it should be noted, is the fastest-declining sector of emissions), reducing its emissions has largely been accomplished through procurement of cleaner electricity. Procurement decisions, though guided in part by ARB emission reduction targets, are not in the purview of ARB.

As described in the background, ARB’s existing statutory direction for the scoping plan requires them to consult with CPUC and CEC on all elements of the scoping plan that pertain to energy-related matters (including, specifically, electrical generation and providing reliable and affordable electrical service). Given this existing direction, and the inclusion of the specified zero-carbon resources in CPUC and CEC planning processes already, it is not entirely clear how this inclusion would improve the alignment of GHG emission reduction and clean power delivery goals.

As ARB makes its estimations of future emission trends in California, it is important that it base those numbers on a holistic, integrated picture of California’s policies. Understanding future changes to procurement and the composition of California’s power grid is undoubtedly part of that. *Given the scoping plan focuses on emissions reductions strategies ARB can advance, it is unclear if the proposed procurement considerations in SB 423 are appropriate for inclusion, and the committee may wish to consider removing the scoping plan component from this bill.*

**Related/Prior Legislation**

SB 68 (Becker, 2021) revises the state’s energy procurement policy to establish a goal that 100 percent of electrical load be supplied by eligible clean energy resources, as defined. The bill would establish the California 24/7 Clean Energy Standard Program, which would require specified percentages of electricity sales be from clean energy resources, as defined. SB 68 is currently in the Senate Energy, Utilities, and Communication committee.

SB 646 (Hertzberg, 2021) among other provisions, makes changes to the IRP so that the benefits and costs of energy procurement by an electrical corporation are equitably distributed. SB 646 is currently in the Senate Energy, Utilities, and Communication committee.

SB 18 (Skinner, 2021) among other provisions defining green hydrogen, tasks ARB with including a strategic plan for green hydrogen in the next scoping plan update. SB 18 is currently in the Senate Environmental Quality committee, and will be heard April 29<sup>th</sup>, 2021.

**SOURCE:** Author

**SUPPORT:**

350 Silicon Valley  
Alliance for Nuclear Responsibility  
Berkshire Hathaway Energy  
Clean Power Campaign  
Coalition of California Utility Employees  
Environment California  
Fervo Energy  
Form Energy  
Green Hydrogen Coalition  
Plug in America  
The Climate Center

**OPPOSITION:**

Agricultural Energy Consumers Association  
Edison International and Affiliates, Including Southern California Edison

**ARGUMENTS IN SUPPORT:** According to the Climate Center, “for the state to achieve its renewable and zero-carbon energy goals while also ensuring a stable

and reliable clean grid, California needs a diverse set of renewable and zero-carbon energy resources that are increasingly firm and dispatchable. The role of these resources— which include offshore wind, geothermal, green hydrogen, long duration storage, and multi-day storage— are less well represented and understood in agency planning efforts. The need for diverse resources, the benefits of firm resources, and need to better understand the role of these resources in grid and reliability planning were key takeaways of the Energy Commission, Public Utilities Commission, and Air Resources Board’s recent joint agency report on SB 100 implementation.”

**ARGUMENTS IN OPPOSITION:** According to Southern California Edison, “This bill is not only unnecessary, as regulatory agencies already consider these resources in their planning processes, but it also undermines the resource planning process by prioritizing costly resources over others which may or may not provide more reliability. While service reliability is critical for California utility customers, it is not the only consideration in resource planning and should not come at the expense of customer affordability. The CPUC and other regulators are already considering these important tradeoffs through their energy and resource planning proceedings.”

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