Date of Hearing: April 21, 2021

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY
Chris Holden, Chair
AB 427 (Bauer-Kahan) – As Introduced February 4, 2021

SUBJECT: Electricity: resource adequacy requirements

SUMMARY: *As proposed to be amended*, this bill will set a deadline by which the California Public Utilities Commission (CPUC), in consultation with the California Independent System Operator (CAISO), must establish a capacity value for behind the meter resources (BTM) for purposes of participating in the state's electricity markets.

EXISTING LAW:

1) Requires the CPUC, in consultation with the CAISO, to establish resource adequacy requirements for all load-serving entities (LSEs), facilitate the development of resources, equitably allocate costs of generating capacity, minimize enforcement requirements and costs, and maximize the ability of CCAs to determine the resources used to serve those customers. (Public Utilities Code § 380)

2) Requires the CPUC to establish rules for how and when backup generation may be used within a demand response (DR) program and to establish reporting and data collection requirements to verify compliance with those rules. (Public Utilities Code § 380.5)

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

BACKGROUND:

Resource Adequacy – Commonly referenced as "RA," is a term often heard but frequently not well understood in the electricity sector. In the simplest terms, RA is just a regulatory construct developed to ensure that there will be sufficient resources available to serve electric demand under all but the most extreme conditions.

In the wake of the California Electricity Crisis of 2000-01, the state determined that it was necessary to develop a system that would prevent the kind of power shortages, extreme price spikes, and rolling blackouts that occurred during that turbulent period. The Legislature adopted the requirement for RA which requires the CPUC, in cooperation with the CAISO, to adopt a program that would require all retail LSEs (which includes investor-owned electric utilities, energy service providers, and community choice aggregators) to "maintain physical generating capacity and electrical demand response adequate to meet its load requirements, including, but not limited to, peak demand and planning and operating reserves."

The CPUC and CAISO have adopted a series of decisions over years to develop the RA program as it exists today. While some other markets in the US, such as PJM and the New England ISO, operate centrally cleared capacity markets, California's market is bilateral, based on individual transactions between LSEs and resource owners. At the most basic level, LSEs are required to

own or contract with sufficient resources to meet their share of the CAISO system's peak demand, plus a planning reserve margin ("PRM") of 15%.[1] This "System" RA obligation ensures that those resources will be available to serve CAISO demand when needed. A (supply or demand) resource that commits to providing RA undertakes a "must-offer" obligation to bid or self-schedule its capacity into the CAISO market. The actual dispatch of resources to meet load in real-time is performed on an economic basis, with the lowest (variable) cost resources committed first. Thus, an RA resource must be offered into the market, but it may not be dispatched to serve load if there are cheaper non-RA resource bids available.

The RA program also requires each LSE to procure a certain amount of its RA from "Local" resources that are sited in certain load pockets where supply is needed due to insufficient transmission to serve the entire load (e.g., SF Bay Area, LA Basin, San Diego, etc.). Finally, as one means of dealing with the so-called duck curve problem, each LSE must procure a certain amount of its RA from "Flexible" resources that can ramp up or down on short notice to meet variations in load and intermittent energy production.

For resource owners, the RA program provides an additional source of revenue beyond just actual energy sales to help cover their fixed costs of providing service. To qualify to sell RA, a resource must register with the CAISO and be tested to determine if it is "deliverable" to load when the transmission system is stressed by high demand. Each resource is assigned a net qualifying capacity ("NQC") value, which defines the amount of RA that it can sell. For intermittent resources like wind and solar, this value is typically well below the nameplate capacity of the facility, reflecting the probability that they will be generating at the time of the system peak. Demand response and storage resources are eligible to provide RA, while energy efficiency is generally subtracted from the load forecast. The CAISO tariffs also allow aggregations of distributed resources to participate in its markets.[2]

Capacity Related Terms – Understanding the following terms is helpful to understanding the resources are eligible for RA and valued in the market:

> Capacity Values – An important aspect of the benefits of renewable electricity is its capacity value, or the ability of renewable generators to reliably meet demand. Generator outages, which can occur due to mechanical failures, planned maintenance, or lack of real-time generating resources (especially in the case of renewables), may leave a power system with insufficient generating capacity to meet load.
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> Capacity generally refers to the rated output of the plant when operating at maximum output. Capacity is typically measured in terms of a kilowatt (kW), megawatt (MW), or gigawatt (GW) rating. Rated capacity may also be referred to as "nameplate capacity" or "peak capacity." This may be further distinguished as the "net capacity" of the plant after plant parasitic loads have been considered, which are subtracted from the "gross capacity."

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[1] A recent decision by the CPUC increased the PRM to 17.5% for 2021 and 2022 in response to the outages experienced last summer. The action is reflected in D.21-03-056, adopted March 25,2021 and available at https://docs.cpuc.ca.gov/publisheddocs/published/g000/m373/k745/373745051.pdf

[2] Summary reprinted from *GridWork*s at https://gridworks.org/2018/06/resource-adequacy-what-is-it-and-why-should-you-care/

Capacity factor is a measure of how much energy is produced by a plant compared to its maximum output. It is measured as a percentage, generally by dividing the total energy produced during some period of time by the amount of energy it would have produced if it ran at full output over that period of time.

Capacity value refers to the contribution of a power plant to reliably meet demand. Capacity value is the contribution that a plant makes toward the planning reserve margin. The capacity value (or capacity credit) is measured either in terms of physical capacity (kW, MW, or GW) or the fraction of its nameplate capacity (%). Thus, a plant with a nameplate capacity of 150 MW could have a capacity value of 75 MW or 50%. Solar plants can be designed and operated to increase their capacity value or energy output.

Capacity payment is a monetary payment to a generator based on its capacity. The capacity payment is generally in terms of $/MW where the MW is the amount of capacity sold into the market.[3]

Behind the Meter Storage (BTM) – Batteries installed on the customer's side of the meter represent a growing sector of the distributed energy resources market and require the review of many programs to see how they fit and should be valued.

BTM can't dispatch in the traditional sense of a power plant. It can "dispatch" in the immediate area of the battery thus reducing the dispatch necessary to serve load in the area from traditional generation sources.

- As a wholesale demand response resource batteries can be bid by a scheduling coordinator into the CAISO market as a demand response resource (bundled with storage and other premise DR) and earn market revenues and RA capacity payments by reducing the customer's load when dispatched by the CAISO;

- As a distributed energy resource a BTM resource (like a battery) can participate in the CAISO market like any other generator, providing energy services to the CAISO directly and fully, earning market revenues; and

- As a load modifying resource batteries can be a load modifier and "reduce" premise load that must be served by the grid and export any excess energy back onto the grid, in many cases, earning net energy metering (NEM) revenues or credits for the excess energy exported onto the grid and offsetting retail purchases and "avoiding" RA if the load modifying actions reduce the overall RA needs of the system. A load modifier is not "integrated" into the CAISO market or dispatched by the CAISO.

COMMENTS:

1) *Author's Statement*. The blackouts of 2020 showed us that our grid needs a more sustainable backup mechanism. This does not mean we need whole new power plants or purchase energy from other states. California had enough energy in home batteries to resolve the demand imbalances during the blackouts. This bill directs the CPUC to

[3] Summary reprinted from *National Renewable Energy Laboratory* at https://www.nrel.gov/docs/fy12osti/54704.pdf

maximize usage of our existing storage and clean generation – providing a path for a more sustainable and more sustained energy.

2) *Amendments*. *This analysis reflects amendments agreed to by the author which strike added provisions to PUC 380 (b) (2), retaining current law, and in the new subdivision (k) strike "incorporate" and add "consider" at page 7, line 14.*

3) *Can't Keep Up*. This bill is reflective of the growth of distributed energy resources and the challenges of the grid and regulatory sphere to incorporate those resources. The creativity of the technology sector doesn't tend to match the ability of a grid designed more than a century ago and the procurement structures of heavily regulated electricity markets. Additionally, testing and determining the reliability of BTM batteries is critical before validating the resource for the purposes of RA.

   The batteries don't generate electricity; the batteries store electricity generated from another source. Some customers have batteries associated with rooftop solar and a growing number of customers have stand-alone batteries which pull electricity from the grid. The battery is only as reliable as the person or system charging and dispatching it. The source of electricity to charge the battery and the availability of the resource to "dispatch" affects its market value.

4) *BTM & RA*. There are contracts between the aggregators of BTM batteries and LSEs for RA. The CPUC has a proceeding open on RA and the capacity value of BTM batteries is being considered. The use of BTM batteries for RA is also subject to FERC jurisdiction and rules of the CAISO. The supporters of this bill acknowledge the attention of the agencies to the issues but are concerned that it will be dropped on the cutting room floor as proceedings develop. They opine that the lack of a capacity value prevents full participation of BTM batteries in the RA market. This bill, as proposed to be amended, would require the CPUC to adopt that value no later than July 1, 2022 for the 2023 resource adequacy year.

REGISTERED SUPPORT / OPPOSITION:

Support*

Bioenergy Association of California
California Efficiency + Demand Management Council
California Energy Storage Alliance
California Solar & Storage Association
Clean Power Campaign
East Bay Community Energy (EBCE)
Marin Clean Energy (MCE)
Silicon Valley Leadership Group

Oppose*

California State Association of Electrical Workers
Coalition of California Utility Employees
Edison International and Affiliates, Including Southern California Edison
IBEW Local Union 569

**Positions are based on the bill as introduced and may be affected by amendments reflected in the analysis*

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