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SB 100 Comments - Modeling Inputs & Assumptions Workshop

Additional submitted attachment is included below.

March 9, 2020

California Energy Commission
Docket No. 19-SB-100
Docket Office
1516 Ninth Street
Sacramento CA 95814

Submitted Electronically via CEC website to Docket 19-SB-100

Re: Comments on SB 100 Joint Agency Report: Modeling Inputs and Assumptions Workshop

I. INTRODUCTION AND SUMMARY

The California Wind Energy Association (CalWEA) is a 20-year-old trade association representing wind energy and related companies focused on the California market. CalWEA is pleased to provide our recommendations in response to the February 25, 2020, workshop on modeling inputs and assumptions for the studies that will support the completion of the SB 100 Joint Agency Report, which will begin to chart the course for how the state can best achieve a 100% carbon-free electricity sector.

In summary, CalWEA makes the following recommendations and comments:

- Consistent with the CAISO's recommendation, SB 100 studies should address options for greater resource diversity in the near-term, including:

  (1) sustained development of 6 GW of commercial offshore wind energy projects, beginning with 1 GW of capacity online by 2027, and

  (2) a subsea cable that functionally relieves congested transmission capacity between northern and southern California, delivers existing capacity into the locally constrained LA Basin thus enabling multiple in-basin gas plants to close by 2027, enables the delivery of offshore wind power to Southern California and reduces wildfire-related outage risks.

  Achieving these goals will require stronger guidance from the CPUC to the CAISO, directing CAISO to plan transmission solutions to enable gas-plant retirements in the LA

basin by 2030 and gas-plant retirements more broadly by 2045. Given the lead-time required to plan and build transmission, this guidance must be given in the current cycle of the CPUC's Integrated Resource Planning process.

- We strongly support the inclusion of offshore wind resources as "candidate" resources in the menu of options from which RESOLVE can select to create an optimal portfolio, and recommend that at least 12 gigawatts (GW) of resource potential be included.

- We strongly support the inclusion of all demand-side resources, particularly behind-the-meter (BTM) photovoltaic solar, as candidate resources.

- We support the inclusion of four wind energy "resource availability" scenarios. However, just as it makes sense to evaluate offshore and out-of-state wind in the high-electrification scenario, it also makes sense to include these additional wind resources in the biofuels and high hydrogen scenarios. If possible, the studies should seek to determine what *combination* of *all* of these things – resources and "demand values" (electrification, biofuels, hydrogen) makes the most sense.

- At least some quantitative assessment should be made of the battery waste that would be associated with the storage requirements of high-solar portfolios.

- High-level land-use models should not be used in the SB 100 process to preclude California wind resource evaluation.

II. RECOMMENDATIONS AND COMMENTS

1. SB 100 Studies Should Evaluate Greater Diversity in the Near-Term

The comments of the California Independent System Operator at the February 24, 2020, workshop were striking. The CAISO raised significant concerns about a portfolio dominated by solar and batteries, including charging during multiple-day periods of cloud coverage and dramatically increasing ramping requirements.[1] The CAISO stated, "It is critical for policy makers to act now to diversify the fleet based on energy and reliability needs, rather than wait for technologies to be cost effective" and recommended that intentional steps be taken to "unlock value." The CAISO recommended "limited testing of a variety of new(er) technologies rather than significant investment in a limited portfolio that reduces diversity," and noted that new technologies will need to be proven at scale before transitioning away from current technology. The CAISO also highlighted the importance of taking steps, including transmission solutions, to enable the retirement of gas plants.

[1] Energy Commission Docket 19-SB-100, "Planning for reliability and resource adequacy under SB100 - California ISO Presentation" at slides 4 and 5. (Docketed on February 25, 2020.)

CalWEA strongly encourages the Joint Agencies to use the SB 100 studies as an opportunity to evaluate technologies that may warrant the near-term investment that the CAISO called for. We agree with the CAISO that the state needs to be proactive in ensuring the achievement of its SB 100 goals, which will be best-served with a diversity of resources, including transmission resources, even if paying an "insurance premium" is required. In particular, we urge the SB 100 process to consider a scenario in which a combination of offshore wind and offshore transmission is in-service by the mid-2020s to determine both the costs and benefits of this relatively near-term investment.

a. A combination of offshore wind and offshore transmission offers substantial promise

Among the most promising resource diversity options to study in the SB 100 process is a combination of (1) sustained development of 6 GW of commercial offshore wind energy projects, beginning with 1 GW of capacity online by 2027, and (2) a subsea cable that functionally relieves congested transmission capacity between northern and southern California, reduces wildfire-related outage risks**,** enables the delivery of offshore wind power (or other system capacity) to meet local capacity requirements in the West LA Basin, and enables multiple in-basin gas plants to close by 2027. Both of these technologies are supported by the recommendations that the CAISO put forward in its recent comments.[2]

i. Offshore wind

Studies for California have already shown that developing offshore wind resources would substantially lower the cost of achieving SB 100 goals, enable gas-plant closures, and reduce the need for storage (and associated battery waste).[3,4,5] Beyond these hard benefits, the diversity benefit of adding offshore wind to the portfolio will reduce the "all of California's eggs in a few baskets" risks that both the CPUC and the CAISO have flagged.[6]

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[2] *Supra* note 1.

[3] *See* (at Figure 16): Mahone, Amber, Zachary Subin, Jenya Kahn-Lang, Douglas Allen, Vivian Li, Gerrit De Moor, Nancy Ryan, Snuller Price. 2018. *Deep Decarbonization in a High Renewables Future: Updated Results from the California PATHWAYS Model*. California Energy Commission. Publication Number: CEC-500-2018-012.

[4] The CPUC's 2019-20 IRP 2045 High Electrification sensitivity conducted by staff and included in the November 6, 2019, Commission Ruling on the 2019-2020 RSP showed that adding just under 7 GW of offshore wind and 3 GW of out-of-state wind would allow for the retirement of 5.2 GW of gas capacity, whereas adding 23 GW of out-of-state-wind-with-new-transmission would allow for the retirement of just 1 GW of gas capacity (compared to the base case retirement of 4.5 GW).

[5] Energy + Environmental Economics (E3), "The Economic Value of Offshore Wind Power in California" at p. 35 (August 2019).

[6] CPUC R.16-02-007, Ruling on the 2019-2020 RSP (November 6, 2019) at p. 22-23; and *supra* note 1.

To realize these benefits, development of at least 6 GW of offshore wind in one or more locations should be studied, beginning with 1 GW of capacity online by 2027 and 1 GW added on an annual basis thereafter. This recommendation is consistent with the Ocean Protection Council's goal to develop a commercial offshore wind project by 2026.[7] We note that, on the East Coast, a recent offshore wind bid came in at $58/MWh over life of contract.[8] Given the dramatic recent cost declines observed in fixed-bottom installations in both Europe and U.S., we anticipate that floating offshore wind projects will have an LCOE below $50/MWh by the early 2030s.[9]

To fully anchor the floating offshore wind supply chain in the State of California, a 6-GW pipeline is necessary. Only by achieving this critical mass will California trigger the certainty required to spark the significant investments in manufacturing facilities, port improvements, and related infrastructure needed to create a domestic floating offshore wind supply chain based in the State of California. A recent study[10] noted the necessity of a coordinated state-wide approach to maximize the in-state economic benefits of the floating offshore wind industry.

ii. Transfer capacity into the Los Angeles basin

The CAISO has highlighted the need for additional transfer capability into local capacity areas and/or disadvantaged communities to allow for thermal generation retirements, stating that "policy makers need to decide when resources will be retired and/or new resources needed so that transmission solutions can be timely."[11]

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[7] California Ocean Protection Council, *Strategic Plan to Protect California's Coast and Ocean 2020-2025* at Objective 4.4 (p. 28) ("Work towards development of a commercial scale offshore wind project in California that minimizes impacts on marine biodiversity or habitat, currents and upwelling, fishing, cultural resources, navigation, aesthetic/visual, and military operations by 2026.") Adopted on February 28, 2020.

[8] *See* https://www.bloomberg.com/news/articles/2020-02-11/shell-edp-set-record-low-price-for-u-s-offshore-wind-power.

[9] An October 2019 analysis by the National Renewable Energy Laboratory (NREL) concluded that floating offshore wind installations off the Oregon coast could, by 2032, attain a levelized cost of energy (LCOE) in the $53 - $74/MWh range. (*See* NREL, Oregon Offshore Wind Site Feasibility and Cost Study, October 2019, https://www.nrel.gov/docs/fy20osti/74597.pdf.) The NREL analysis noted that these cost figures were also relevant to California offshore wind projects.

[10] UC Berkeley Labor Center, California Offshore Wind: Workforce Impacts and Grid Integration, September 2019, http://laborcenter.berkeley.edu/pdf/2019/CA-Offshore-Wind-Workforce-Impacts-and-Grid-Integration.pdf.

[11] *Supra* note 1 at slide 10.

Thus, the CAISO has signaled that it needs stronger guidance from the CPUC to the CAISO, directing CAISO to plan transmission solutions to enable gas-plant retirements. Given the lead-time required to plan and build transmission, this guidance must be given in the current cycle of the CPUC's Integrated Resource Planning process. The CPUC should direct the CAISO to plan for gas-plant retirements broadly by 2045 and to retire gas plants in the LA basin affecting disadvantaged communities by 2030.

Perhaps the most promising transmission solution for retiring LA basin gas plants is a subsea cable connecting the central California coast to the LA basin, which would have numerous benefits. First, it would create a parallel path to congested Path 26, providing substantial economic benefits. Second, the high-voltage direct-current ("HVDC") transmission lines that would be used in a subsea cable project, along with converter stations, can replace or even enhance the flexibility currently provided by gas plants.[12] Third, a subsea project would enable the retirement of aging gas plants that impair public health in disadvantaged communities. Fourth, a subsea cable could mitigate service interruptions in Los Angeles due to land-based wildfire risks.

Finally, while the economic and public health and safety benefits just described might alone justify a subsea transmission project that creates a parallel path to congested Path 26, such a project would also enable the delivery of offshore wind resources, with their attendant system reliability value, to Southern California. This would address another key objective of the RPS and SB 100, as well as the expressed concerns of the CAISO regarding over-reliance on solar and battery storage: it would enable substantial resource diversity.

2. Candidate Resources

CalWEA strongly supports the proposed inclusion of offshore wind resources as "candidate" resources in the menu of options from which RESOLVE can select to create an optimal portfolio.[13] The supply curve of offshore wind resources should include at least 12 gigawatts (GW) of resource potential, given the 112 GW technical resource potential[14] and available

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[12] One such project, the "Pacific Transmission Expansion Project" ("PTEP"), is now being considered in the 2019-20 CAISO Transmission Planning Process. This project would enable the retirement of 2,000 MW of LA-basin gas plants and could provide delivery capability for offshore wind off of the Central Coast. *See* CAISO Draft 2019-2020 TPP, section 4.8.2 (Jan. 31, 2020) (http://www.caiso.com/Documents/Draft_2019-2020TransmissionPlan-January312020.pdf).

[13] Workshop slides of E3, "Introduction to PATHWAYS and RESOLVE - E3 Presentation" (Feb. 24, 2020) at slide 28.

[14] National Renewable Energy Laboratory and Bureau of Ocean Energy Management, *Potential Offshore Wind Energy Areas in California: An Assessment of Locations, Technology, and Costs* (December 2016). Available at http://www.boem.gov/Pacific-Completed-Studies/.

studies showing that up to 12 GW may be part of California's optimal resource portfolio in 2040 under SB 100.[15]

We further strongly support the proposed inclusion of all demand-side resources as candidate resources, particularly behind-the-meter (BTM) photovoltaic solar. As CalWEA further explained in earlier comments in this docket, only if the total costs associated with each program, technology, locations and alternative strategies are made transparent to decision makers can they make informed, effective trade-offs between costs and other objectives.[16]

3. Resource Scenarios

The proposed SB 100 analytic approach lists four wind energy scenario options that include all, none, or either offshore wind and out-of-state wind with new transmission.[17] These four resource availability scenarios are valuable to include because they will shed light on how offshore and out-of-state wind resources compare and may inform decisions regarding the manner in which these resources are pursued.

However, not all of these resource availabilities are included in each of the proposed modeling scenarios. In fact, both offshore and out-of-state wind are excluded from the high biofuels and high hydrogen scenarios.[18] And only out-of-state or offshore wind is included in the high-electrification scenario, even though some combination of the two may be in order. It makes no more sense to ignore the availability of diverse, low-cost wind resources under the biofuels and high-hydrogen scenarios than it would under the high-electrification scenario. In fact, if possible, it would be more realistic to try to determine what combination of all of these things – resources and "demand values" (electrification, biofuels, hydrogen) makes the most sense.

4. Environmental Protection / Battery Waste

Environmental protection considerations should include at least some quantitative assessment of the battery waste that would be associated with the storage requirements of high-solar portfolios. A resource portfolio dominated by solar would require an order of magnitude more storage to shift excess solar power to meet customer demand during other times of day, compared to a portfolio balanced with wind energy. Battery waste would add to solar waste, whereas a more diverse resource portfolio would replace solar resources with diverse resources and reduce the need for storage.

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[15] *Supra* note 5.

[16] *See* CalWEA's Comments on SB 100 Joint Agency Report: Charting a Path to a 100% Clean Energy Future (September 19, 2019).

[17] Workshop slides of Mark Kootstra, "SB 100 Analytic Approach", at slide 31 (Feb. 24, 2020).

[18] *Id.* at slide 32.

California currently does not have a robust reuse or recycling program in place. This is a concern, considering that a single 8-MW lithium ion battery project requires a 6,300 square-foot building to house,[19] and the CPUC is currently considering a 2030 portfolio containing 10,000 MW of additional battery storage. The CPUC and CalRecycle have only recently embarked on a process to explore solutions for properly managing the waste stream associated with batteries deployed for the electric grid and in transportation electrification.[20]

5. High-level Land-Use Models Should Not Be Used to Preclude California Wind Resource Evaluation

CalWEA strongly cautions against using, in the SB 100 process, the sort of high-level models put forward by The Nature Conservancy to limit potential exploration of in-state wind resources.[21] The wind resources that remain potentially available in California are extremely limited as a direct result of previous application of such models to the vast California desert, which resulted in widespread prohibition of wind energy development without benefit of site-specific studies of any sort. The stringent, site-specific studies that developers are obligated to conduct pursuant to state and federal law are necessary to determine environmental impacts at a particular site and should not be precluded by any high-level studies being conducted by the state for broad planning purposes.[22]

Sincerely,

/s/
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[19] *See* https://newsroom.edison.com/releases/sce-unveils-largest-battery-energy-storage-project-in-north-america .

[20] *See* https://www.cpuc.ca.gov/recycle/.

[21] Workshop slides of The Nature Conservancy, "Power of Place - Land Conservation and Clean Energy Pathways for California" (Feb. 25, 2020).

[22] *See* CalWEA Comments on DRECP Land Use Plan Amendments (March 22, 2018). Available at https://www.calwea.org/sites/default/files/documents/CalWEA_Comments_on_NOI_to_Amend_DRECP_%283_22_18%29.pdf.)