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Supplemental Comments on AB 525 OSW Planning Goals

Additional submitted attachment is included below.

July 7, 2022

California Energy Commission
Docket No. 17-MISC-01
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1516 Ninth Street
Sacramento CA 95814

Submitted Electronically via CEC website to Docket 17-MISC-01

Re: Supplemental Comments Following June 27, 2022, Workshop on AB 525 Offshore Wind Planning Goals

I. INTRODUCTION AND SUMMARY

The California Wind Energy Association ("CalWEA")[1] appreciates this opportunity to provide supplemental written comments on the Commission's draft report: *Offshore Wind Energy Development off the California Coast: Maximum Feasible Capacity and Megawatt Planning Goals for 2030 and 2045* ("Draft Report"), in view of four studies that were released after the posting of the draft report and discussed at a June 27, 2022, workshop. As the Commission docketed on June 23, 2022, those studies were:

- National Renewable Energy Laboratory's "Assessment of Offshore Wind Energy Leasing Areas for Humboldt and Morro Bay Wind Energy Areas" ("NREL Study"),[2]
- GridLab, Telos Energy and Energy Innovation's "Reliably Reaching California's Clean Electricity Targets: Stress Testing Accelerated 2030 Clean Portfolios" ("GridLab Study"),[3]
- The Goldman School of Public Policy, UC Berkeley's "The Offshore Report: California" ("UCB Study"),[4] and

[1] CalWEA is a 22-year-old trade organization whose members are focused on developing wind energy resources within and directly interconnected to California and off the coast of California, as well as capturing the related economic and workforce development benefits for California. CalWEA's members with interests in offshore wind include Brookfield Renewable Energy Group, Business Network for Offshore Wind, DEME Offshore U.S., Floventis Energy, Sempra Infrastructure, and Wind Stream Properties.

[2] Available at: https://www.nrel.gov/docs/fy22osti/82341.pdf. Workshop presentation at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=243707&DocumentContentId=77539.

[3] Available at: https://gridlab.org/wp-content/uploads/2022/05/GridLab_California-2030-Study-Technical-Report-5-9-22-Update1.pdf. Workshop presentation at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=243711&DocumentContentId=77543

[4] Workshop presentation at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=243710&DocumentContentId=77544

- The Nature Conservancy's "Power of Place West," forthcoming publication by The Nature Conservancy ("TNC Study").[5]

In carefully considering these new studies, which provide new information and analyses not previously available, CalWEA believes that they bolster the points that CalWEA made in its May 16, 2022, comments and that they support higher targets within each target range. As discussed below, CalWEA now recommends:

- **a 2030 target range of 1 GW to 5 GW**
- **a 2045 target range of 30 GW to 50 GW**

We note that the GridLab Study and, in particular, the UCB Study analyzed the costs, reliability, and resource-diversity benefits of high levels of offshore wind – analyses that were completely missing in the Commission's development of its May 2022 draft report. While a 50-GW high-end planning target may initially strike some as unachievably high, CalWEA stresses several points:

(1) The current SB 100 plan includes levels of land-based solar and battery resources that are even more massive and potentially at least equally challenging.

(2) The current solar-and-battery-based plan poses numerous risks that a portfolio significantly diversified with offshore wind could dramatically reduce, while also reducing total costs and dramatically reducing total capacity requirements by over 60 GW.

(3) The updated information on achievable offshore wind energy density and ocean depths greatly increases the technical potential within which to "find" 50 GW where conflicts are limited.

(4) The state is unlikely to plan for, or achieve, what it does not consider to be the "maximum feasible" planning target.

Achieving higher levels of offshore wind – levels commensurate with the amounts of solar and batteries in the current SB 100 plan – will require a careful sequencing of decisions, given the logistics and timelines involved. Creating the possibility of achieving higher 2045 targets will require actions beginning soon after the targets are set, which is why the Commission should not conclude that "we can always raise targets later." Thus, each goal range should be associated with the decisions and timelines that would be necessary to achieve each end of the range.

[5] Workshop presentation at:
https://efiling.energy.ca.gov/GetDocument.aspx?tn=243688&DocumentContentId=7751

II. THE ADDITIONAL STUDIES SUPPORT HIGHER 2030 AND 2045 TARGET RANGES

A. Multiple major benefits are associated with higher targets

As CalWEA discussed in its May 2022 comments, ranges are appropriate for both the 2030 and 2045 planning goals, given many uncertainties that will not be resolved even by the time that the strategic plan is finalized in June 2023. The UCB Study shows that substantial reliability benefits could be gained from higher levels of offshore wind to create a more balanced portfolio, without raising costs.[6] While focused on lower levels of offshore wind in 2030, the GridLab Study supports these findings. These types of cost and reliability analyses looking at higher goals simply was not conducted by the Commission to inform its draft report. Moreover, the Commission's draft report contained no consideration of the myriad benefits of a more diverse resource portfolio, as CalWEA advocated in its May 2022 comments.

Importantly, the UCB Study found that 50 GW of offshore wind would reduce overall clean energy capacity requirements by 61 GW.[7] This reduced overall need for capacity is, in and of itself, a major benefit of a diverse portfolio, as it will reduce overall demand for land and sea space and will reduce the overall raw material requirements for achieving our SB 100 goals – and, in so doing, will increase the odds that California will meet its clean-energy goals.

The UCB Study also put a number on the potential reliability impacts of wildfire smoke on a solar-dominated portfolio – a potential 35-40 GW drop in solar production, with effects that could extend over a week. The economywide costs of an unreliable grid are difficult to quantify, but as we have seen recently with Governor Newsom's concern over maintaining reliability in the coming years, and the Legislature's recent passage of AB 205, a reliable grid is highly valued.

The GridLab Study notes the need to evaluate other very important, but harder to quantify, risks from a solar-heavy portfolio, such as limitations on, and conflicts over, land availability. To CalWEA's knowledge, no one has yet carefully considered these and other resource diversity benefits, such as supply chain and operational risks, that will be present with a grid that is heavily reliant on solar and batteries.

In view of these major benefits of a more-diverse portfolio, which can reasonably be expected at no additional cost, CalWEA believes that the additional studies support higher goals for 2030 and 2045 targets, as follows.

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[6] CalWEA also had its consultant, GridBright, perform a computer run of the Joint Agency SB 100 model in which the 10-GW offshore wind cap was lifted. The results showed that the model selected all 14.5 GW of OSW that was available to the model.

[7] The UCB Study found that 50 GW of offshore wind in 2045 would reduce solar and storage deployments by 121 GW (77 GW and 44 GW, respectively). As 10 GW of offshore wind was in the base case, this capacity is replaced by 40 GW of offshore wind, and the overall capacity requirement is reduced by 61 GW (121 GW - 40 GW).

B. The 2030 planning target should be a range of 1 GW to 5 GW and should highlight the governmental actions that would be required

Achieving the state's goals for the early 2030s is important not only to reduce greenhouse gas emissions in the near-term, but also to lay the foundation for achieving the 2045 goals. The first projects in California must begin to build the industrial capability needed here at home – in addition to foreign sourcing – to fabricate and assemble floating platforms and other components. California should not rely entirely on foreign-sourced equipment because the state cannot necessarily count on foreign suppliers to meet its needs in a very large and competitive global market – and California should add to the world's industrial capabilities to help meet worldwide demand for floating offshore wind projects. Further, California deserves to capture some of the economic and workforce benefits of the capacity that it is paying for.

Therefore, the state should strive to install a minimum of 1 GW by 2030 and, if 5 GW proves to be unachievable by 2030, it can follow in the subsequent few years.

1. 5 GW can be accommodated at Morro Bay by 2030

The NREL Report found that industry norms now support power density assumptions of at least 5 MW/km2 (rather than the 3 MW/km2 assumed in the Commission's draft report), such that the Morro Bay study area could support 5 GW or more. As transmission capacity potentially exists for 5 GW at Morro Bay,[8] the "stretch goal" for 2030 (or subsequent few years) should be approximately that amount. While this target range for 2030 would require the state and federal governments to act with uncharacteristic and unprecedented boldness and speed, the climate imperative demands such action, and the resource and transmission capacity exists. Thus, it is a maximum feasible high-end target.

2. Streamlined permitting and other actions would be required

Achieving even 1 GW by 2030 would require various state and federal agencies to take numerous actions.

- Most critically, BOEM and the state would need to streamline their siting processes to reduce permitting timelines by two years to allow installations by 2030. It is unclear, however, whether federal and state environmental laws – or political reality – would allow such significant streamlining. In addition, one or more of the developers that win BOEM leases would need to be committed to fabricating floating platforms in California, the importance of which is discussed below. The degree to which BOEM's auction rewards such commitments may be determinative.[9]

[8] See CalWEA's March 11, 2022, comments in this docket. Also see further discussion below.

[9] BOEM's draft lease auction proposes a 20 percent uplift for domestic fabrication. At an assumed bid price of $250M for 1 GW, this value becomes $50M. This will likely be insufficient to overcome the cost advantage of Asian imports, which could exceed $200M per 1GW. Thus, CalWEA is advocating for higher uplift credits.

- The CPUC would need to designate a central procurement entity to sign contracts with initial offshore wind projects on behalf of all CPUC-jurisdictional load-serving entities (LSEs).[10] Alternatively, the legislature could spread this obligation on all LSEs.
- While CalWEA agrees that sufficient transmission capacity exists for 5 GW at the Central Coast, without Diablo Canyon's retirement, there will be competition for that capacity. An obscure but critical stakeholder process is occurring now at the CAISO that will have a significant bearing on the amount available transmission capacity – the CAISO's re-evaluation of the dispatch assumptions that it uses in its deliverability assessment methodology. This proceeding (and continued reforms) could make all the difference in whether there will be sufficient grid capacity to interconnect, with full deliverability, up to 5 GW of offshore wind at Morro Bay without waiting for new transmission to be built.[11]

Even with all the above requirements met, the logistics and timelines involved in getting even 1 GW in the water by 2030 are daunting. To promote California and U.S. domestic content and to increase global industrial capacity for floating offshore wind, the state (and possibly federal) government would need to expand support of offshore wind to include port development in San Francisco and Southern California and otherwise support supply chain and workforce development.

The fabrication of foundations and their final integration with the turbines, which must be done at coastal locations near the wind farm sites, will have huge scale, unprecedented logistical challenges, and infrastructure needs that the state has not thoroughly examined. Here is a sketch. For each production facility, it is reasonable to expect that 18 months or more of start-up time will be required to finalize construction contracts and secure financing, including preparations for local production and fabricating the first foundation. The realities of financing mean that this 18-month timeline cannot begin until permit approvals are granted from BOEM, which are currently not expected until mid-2030. Assuming that the permitting process can be accelerated by two years, this date becomes mid-2028. From that point forward, when the first foundation is completed, it will likely take two weeks to complete a 15-MW foundation based on industry experience in other markets (30 MW/month per facility). Thus, one production facility could produce 1 GW within three years. If we assume three production facilities in California, 1 GW could be produced in one-third that time (within one year, by mid-2029). Achieving this goal will also require additional steel fabrication capacity to

[10] This CPUC action would require that commission to recognize that initial offshore wind projects will come at a relatively high cost. The UCB Study assumed higher costs for early projects, based on NREL's cost curves, in finding that as much as 50 GW of offshore wind could be planned for without raising overall costs by 2045. Moreover, the CPUC should recognized that higher costs are justified by the resource diversity values identified in the UCB and GridLab studies, as well as the necessity of gradually scaling up industry and workforce capabilities.

[11] CalWEA's comments on this CAISO matter are available here: https://www.calwea.org/public-filing/informal-comments-caiso%E2%80%99s-proposed-peak-deliverability-study-generation-dispatch.

be developed on the West Coast to provide a sufficient supply for large-scale fabrication of steel foundations.

To achieve a 5-GW target in the same time frame, the balance of foundations for 4 GW of capacity would thereby need to come from 12 additional facilities around the world with similar capacities. Similar lead times will be required from foreign sources, since developer commitments cannot be made until permits are issued.

3. State waters pilot projects could facilitate the industrial and workforce build-up

Two pilot projects are now in the State Lands Commission's permitting process which, importantly, has a much shorter permitting process than BOEM's process. At least one of these projects – CADEMO,[12] which is more advanced – is planning to deliver full-scale technology in the water four or five years ahead of the BOEM projects. This project could play a critical role in driving the scale-up necessary to support California fabrication of the floating platforms and development of other domestic economic content. One or both projects could help to secure and build port infrastructure, develop industrial and workforce experience with the assembly (and potentially manufacturing) of complex floating platforms, and secure vessels to deploy the turbines and foundations. Given the tight timelines to achieve 2030 goals, these projects could play a critical role in developing infrastructure and workforce capabilities as well as in providing evidence regarding project impacts of a larger build-out, which, as discussed below, could facilitate, accelerate, and de-risk the permitting of BOEM projects as necessary to achieve planning goals of 30-50 GW.

C. The 2045 planning target should be a range of 30 GW to 50 GW

The Energy Commission May 2022 draft report's "maximum feasible" 2045 goal of 10 to 15 GW, with technological developments potentially supporting larger goals of as much as 20 GW, should be raised to 30 GW to 50 GW. The goal range can be refined based on the degree to which initial projects are timely achieved and in view of initial impact studies, as well as factors related to alternative resources, such as the difficulty of siting land-based projects and the operational performance of a solar-and-storage-dominated portfolio. But, given the major potential benefits of a portfolio that is balanced with 50 GW discussed in section II.A. above, the Commission should not rule out this target. At a minimum, given the cost and resource diversity benefits, the Commission should plan for offshore wind to account for one quarter of the total energy needs identified in the SB 100 Joint Agency Report (i.e., 30 GW). Moreover, as the UCB Study pointed out, the SB 100 Joint Agency Report did not plan for the energy required to meet the needs of the industrial sector with green hydrogen and CO2 removal. Thus, the state will need to meet the need for an additional ~80 to 100 GW of solar-PV-equivalent to achieve a 2045 net zero goal.[13]

[12] The California State Lands Commission is evaluating the CADEMO project. The project would demonstrate two different floating wind technologies by installing four 12-15 MW floating wind turbines in the area off Vandenberg Space Force Base. See https://www.slc.ca.gov/renewable-energy/offshore-wind-applications/.
[13] UCB Study presentation at slide 6 and workshop remarks of study author Dr. Amol Phadke.

The current 10 GW minimum goal is less than 9 percent of the incomplete energy needs identified in the SB 100 Joint Agency Report. This simply does not meet the Legislature's call for identifying the "maximum feasible potential" for offshore wind.

1. Sufficient resources exist to find low-conflict areas for 50 GW

The NREL Report's findings regarding power density suggest that the five BOEM study areas alone could support almost 29 GW. The NREL Report states that a technical potential of 200 GW exists off the California Coast but did not apply any exclusion screens to this figure. However, in finding that 50 GW of offshore wind would deliver substantial resource diversity benefits without adding costs, the UCB Study did apply exclusions to remove areas considered unsuitable for development, including national marine sanctuaries, marine protected areas, wildlife refuges, shipping and towing lanes, offshore platforms, and ocean pipelines.[14] UCB's analysis was based on current technology and did not consider the increased energy intensity identified by NREL or the technical potential to site floating platforms in waters as deep as 3,000 meters (achieved today with oil rigs), which would increase the technical potential from 200 GW to 800 GW.[15] This larger potential both increases the area available and reduces the area required to support 50 GW, which increases the opportunity to protect the environment and address competing uses while achieving a goal of up to 50 GW by 2045.

The TNC Study concludes, after screening for "suitable areas" that "26 GW may be needed for the West Coast." However, no cost information was presented regarding how the 26-GW scenario compares with a scenario more reliant on offshore wind. Moreover, CalWEA strongly cautions against precluding resource areas based on high-level modeling studies. We will not be able to assess potential impacts of planning goals until specific sites are evaluated with field studies and the actual impacts of the initial offshore wind projects are studied. Field studies simply cannot be reproduced by a desktop study of any sort. The Commission should not conclude that areas of the ocean that are not legally off limits today are incompatible with various concerns.

Experience with the 2016 Desert Renewable Energy Conservation Plan (DRECP) informs our view. The DRECP dramatically curtailed wind energy development potential in California's vast desert region because wind energy conflicts were presumed based on high-level modeling. Approximately a dozen wind energy projects, including one with completed field studies documenting limited potential impacts, were being pursued at the time that the DRECP effort was announced in late 2008; none of those projects survived the DRECP process and, to our knowledge, no wind energy applications have been filed with the BLM within the DRECP area in the seven years since the DRECP was adopted. This mistake should not be repeated with the AB 525 planning goals.

2. The steady deployments required to achieve 30 to 50 GW would benefit from a state waters pilot projects

As outlined above, if three production facilities for the fabrication and assembly of floating platforms are developed in California, the state would have the ability to produce 1 GW of

[14] Personal communication between Nancy Rader and study author Dr. Amol Phadke (June 30, 2022).
[15] UCB Study presentation at slide 13.

capacity in roughly one year's time. If permitting timeframes are reduced by two years, and production begins by mid-2028, then California could produce approximately 17 GW by 2045. If California doubles the number of production facilities to six, it could produce on the order of 34 GW by 2045, with the balance coming from abroad.

But maintaining a steady pace of development will require a steady pace of project permitting to support the investments that are required to support production. And yet the first projects in the Morro Bay lease area will not be completed until 2029 (again, assuming accelerated permitting) and several more years will be required to understand the impacts to the environment and fisheries. Real-world information on impacts will likely be desired in the permitting process for the next lease areas, potentially creating a delay in the steady deployment necessary to achieve 2045 goals.

The needed information on impacts could, however, be supplied by the proposed pilot projects in state waters. CADEMO is on track to generate information on impacts five years ahead of the first deployments at Morro Bay. In addition, mitigation measures will be developed, tested and validated. All this information could facilitate the continuation of steady deployments, particularly if the pace of development is interrupted (e.g., by potential lawsuits). The Commission should therefore make note of the important roles that could be played by one or both pilot projects in supplying the information necessary to support the initial commercial developments as well as the achievement of the longer-term goals.

3. A planning range is appropriate for transmission planning purposes

Under a systematic approach, the transmission upgrades required for a goal range of 30 – 50 GW can be effectively planned in phases. For example, the first phase could be an offshore network with multiple landfalls, whereby the offshore network also enhances the reliability of the onshore grid. The second phase could be the reinforcement and expansion of the onshore network to work hand in hand with the offshore network to support more capacity. A final potential phase could include a hydrogen production alternative.

III. CONCLUSION

In conclusion, as we discussed in our May 16, 2022, comments, numerous challenges will be associated with achieving specified goals, particularly the 2030 goals. The UCB Study makes the basic point that strong policies would be required for significant OSW additions by 2030, and the GridLab Study makes the point that "resource diversity is unlikely to occur without direct policy or market intervention." We agree. The planning goals should be associated with a discussion about the decisions that would be required to achieve them. Otherwise, they will carry little meaning.

CalWEA appreciates this additional opportunity to comment and strongly supports full consideration of the additional studies.

Sincerely,

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