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Supplementary comments to previous UCB submission on OSW planning goals

Additional submitted attachment is included below.

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Dear Commissioner Vaccaro, Vice Chair Gunda, and Chair Hochschild,

We are California-based energy system scientists and public policy experts with appointments at the University of California, Berkeley, operating in our capacity as private individuals. We have between us 75 years of experience in evaluating power systems and renewable integration issues, including rigorously researching the resource potential of offshore wind worldwide.

We are providing this supplement to our previous comments dated May 12, 2022 regarding California's offshore wind (OSW) planning goals. In our previous comments, we recommended setting a planning goal to deploy 50 GW of OSW in California by 2045 based on several benefits such as sufficiently enhancing resource diversity without increasing wholesale electricity costs. We had summarized our results and methods in our working paper, "The Offshore Report: California", which was also included with our previous comments.

1. In order to provide further transparency on our analysis, we have published the following three data visualization dashboards on (i) offshore wind resource potential, (ii) power system integration for a varying degree of OSW deployment, and (iii) hourly grid dispatch in California in 2045. The user can also download the entire dataset for a closer assessment.

2. We find that the current OSW planning goals for 2045 (10-15GW) is a step in the right direction, but it falls short of providing much-needed additional resource diversity, especially with the electrification load growth. For example, our visualization dashboard shows that even with 25 GW OSW deployment by 2045, its share in electricity generation would be a little over 20%, with solar accounting for over 50% generation. By contrast, deploying 50 GW of OSW would contribute significantly to resource diversity. Such a goal would meet 40% of electricity demand in 2045, reducing the grid's reliance on deploying heroic levels of solar and batteries in an all-electric future.

3. Most of the OSW potential assessment, including ours, is done using a wind power density (wind MW capacity per sq km) of 3 MW/km^2. However, the latest information from NREL shows that several planned OSW projects in the U.S. appear to achieve twice the wind power density. For example, Empire Wind (NY): 6.5 MW/km^2, Dominion CVOW (VA): 5.8 MW/km^2.[a] European OSW farms also show similar numbers. For example, North Sea region projects at 6 MW/km^2 and Baltic Sea region projects at 5.5 MW/km^2.[b]

[a] Source: Musial et al (2022). Slide 8, presentation during CEC OSW workshop on June 27, 2022
[b] Source: European Maritime Spatial Planning Platform (last accessed on July 27, 2022)

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Using a wind power density norm of 6 MW/km^2, our OSW potential estimate in CA is 400 GW (instead of 200 GW as reported earlier). This is ***after*** removing areas considered unsuitable for development, such as national marine sanctuaries, marine protected areas, wildlife refuges, shipping and towing lanes, offshore platforms, and ocean pipelines. **Further, when we changed the depth constraint to that already achieved by floating oil platforms today (>2,500m), the OSW potential in the state increased to 800 GW after removing unsuitable areas.** In short, resource availability is unlikely to be a constraint for deployment even after considering a universe of possible exclusions; we require 2% to 3% (50GW) of the total available OSW potential.

4. OSW costs have fallen even faster than originally anticipated. For example, recent UK OSW auctions have revealed a price of about £45/MWh or $55/MWh (2022 currency) for 2026 delivery, which makes it lower than UK's onshore wind and solar PV prices.

5. California has shown its national and global leadership on climate action. By considering significant deployment of OSW, CA can not only ensure sufficient and diverse clean power supply for its own grid, but also spur national and global efforts in the sector, while creating a large number of long-term jobs.

In conclusion, we reiterate our strong recommendation for setting California's offshore wind planning goal of 50 GW by 2045. We will be happy to answer any questions CEC may have or help CEC in their assessments.

Respectfully submitted,

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