

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Continue  
Electric Integrated Resource Planning and  
Related Procurement Processes.

Rulemaking 20-05-003

**CALIFORNIA WIND ENERGY ASSOCIATION  
COMMENTS ON PROPOSED 2023 PREFERRED SYSTEM PLAN AND  
TRANSMISSION PLANNING PROCESS PORTFOLIOS**

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***On behalf of the California Wind  
Energy Association***

November 13, 2023

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**I. INTRODUCTION**

Pursuant to Administrative Law Judge (“ALJ”) Julie Fitch’s Ruling Seeking Comment on Proposed 2023 Preferred System Plan and Transmission Planning Process Portfolios (“Ruling”) issued on October 5, 2023, the California Wind Energy Association (“CalWEA”) submits these opening comments. The 2023 Preferred System Plan (“PSP”) and portfolio will be sent to the California Independent System Operator (“CAISO”) for analysis in its 2024-2025 Transmission Planning Process (“TPP”) and will guide load serving entities (“LSEs”) in their procurement activities and in developing their next round of individual integrated resource plans (“IRPs”).

As directed in the Ruling, CalWEA organizes its comments in the order in which topics appear in the Ruling; however, CalWEA does not comment on all topics in these opening comments.

**II. SUMMARY**

CalWEA strongly supports the substantially greater resource diversity in the proposed PSP. In both 2035 and 2039, the proposed PSP more than doubles the percentage of resources other than solar and four-hour batteries as a percentage of total non-gas capacity additions, compared with either the 2021 PSP or the 2023-24 TPP Base Case portfolio. The proposed PSP is comprised of 42% and 45% diverse resources additions in 2035 and 2039, respectively. As a result, due to the higher capacity factors and generation profile of the diverse resources, the proposed PSP requires *dramatically less capacity overall*. Remarkably, the proposed PSP would, in 2035, require nearly 30% less capacity overall – *over 25 gigawatts less capacity* – than did the 2023-24 TPP base case for 2035. A need for far

less capacity overall will increase the likelihood that California will timely achieve its goals by reducing various types of risks that threaten achievement of the state’s goals.

This diverse portfolio – and the state’s longer-term goals – will only be achieved, however, if modifications to the proposed PSP are made in three areas:

- **More resources must be mapped to promising resource areas in Northern California such that necessary backbone transmission infrastructure will be planned in PG&E’s service territory.** Unfortunately, the proposed PSP includes 5 GW of “in-state” (CAISO-interconnected) wind resource capacity in the “Southern Nevada-Eldorado” region that, despite available transmission, is highly unlikely to be developed. Instead, staff should re-locate this capacity to Central and Northern California where tremendous wind (and solar) resources exist, and request that CAISO draw from its 20-Year Transmission Outlook to strengthen the transmission backbone from the southern to the northern Central Valley. Drawing from the 20-Year Outlook is necessary to correct for inappropriate transmission assumptions that were embedded in the RESOLVE model for Northern California that are completely incongruous with the assumptions for Southern California and were a major driver of the model results. Absent a course-correction, no major deliverability upgrades will occur in Northern California
- **To promote investments necessary to drive down costs, a firm commitment must be made to at least 6.5 GW (rather than 4.5 GW) of offshore wind resources at the Central Coast, including the 60-MW CADEMO project, and 1.6 GW at the North Coast, with the obligation spread among all load-serving entities.** The Commission should plan for sufficient transmission capacity to accommodate OSW as well as storage resources in the queue at the Central Coast. In addition, the Commission should request that CAISO further strengthen the grid in Northern California to enable the development of at least 3 GW of resources, which could accommodate both OSW at Humboldt and Northern California onshore resources.

That is, the Commission’s plan should firmly commit to at least 28.6 GW of wind energy capacity in the PSP (10 GW in-state, 10 GW out-of-state, and 8.1 GW offshore – 6.5 GW at the Central Coast and 1.6 GW at the North Coast) to ensure a reasonably diverse resource portfolio, and should request that CAISO strengthen the Northern California onshore grid to facilitate access to 3 GW of offshore and onshore wind and other renewable resources. This will ensure the benefits of resource diversity, particularly in view of the much stronger wind-solar balance supported by the 24-hourly analysis conducted by Southern California Edison Company (“SCE”) in its enlightening “Countdown to 2045” study.<sup>1</sup>

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<sup>1</sup> SCE, *Countdown to 2045: Realizing California's Pathway to Net Zero* (Sept. 2023). Available [here](#).

- **The Commission should request that CAISO reduce thermal Resource Adequacy capacity in the L.A. Basin in its studies that inform transmission planning in both the current and next TPP cycle.** This is necessary to promote OSW and other clean energy development at the Central Coast, will ensure sufficient capacity to reliably meet electrification needs in the L.A. Basin and enable (not require) the retirement of the dirtiest power plants in the L.A. Basin. This linkage may also ultimately support OSW at the North Coast.

The Commission should not consider itself to be captive to the results of a model and desktop analyses that can provide certain insights but cannot substitute for the need to take various considerations into account and make judgments about how California can best meet its ambitious GHG goals under a challenging set of circumstances.

### **III. COMMENTS ON TOPICS ADDRESSED IN THE RULING**

#### **A. Topic 1 - Aggregation of LSE Plans**

Regarding the offshore wind (“OSW”) contained in specific LSE portfolios that is reflected in the proposed PSP, the Commission should anticipate spreading this capacity (expanded to 6.5 GW as discussed below) among all LSEs. Per the Amended Scoping Ruling, issues related to “long-lead-time” resources and central procurement will be discussed later in this proceeding,<sup>2</sup> however CalWEA believes it is reasonable and preferable to assume, at this point, that the obligation for resources that have substantial long-term portfolio benefits, but higher direct power purchase prices, should be shared by all LSEs and ratepayers.

#### **B. Topic 2.1 – Recommended PSP Portfolio**

CalWEA largely supports the topline picture in the 2023 proposed PSP because it is substantially more diverse than previous portfolios and thus requires substantially less capacity overall. The greater diversity and the reduced capacity need will each increase the likelihood that California will timely achieve its goals and will reduce various types of risks that could threaten achievement of the state’s goals, as discussed below.

This diverse portfolio – and the state’s longer-term goals – will only be achieved, however, if a few important changes are made:

- CAISO-interconnected resources must be more accurately mapped to promising resource areas and the Commission must request that CAISO draw from its 20-Year Transmission Outlook to

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<sup>2</sup> Amended Scoping Ruling at pp. 10-11 (Aug. 21, 2023).

strengthen the transmission backbone in PG&E’s service territory, from the southern to the northern Central Valley.

- A firm commitment must be made for at least 6.5 GW of OSW resources at the Central Coast, specifically including the 60-MW CADEMO project, with OSW obligations spread among all load-serving entities, and transmission interconnections and upgrades must be carefully planned. CPUC intervention, in coordination with CAISO, may be needed to enable OSW developers to demonstrate sufficient procurement interest by the end of 2024 to preserve their TPD capacity allocation.
- The grid in Northern California should be strengthened further to enable the development of OSW at Humboldt, as well as other Northern California resources.
- The Commission should request that CAISO reduce thermal Resource Adequacy (“RA”) capacity in the L.A. Basin in its studies that inform transmission planning, in the current and next TPP cycle, which will support OSW and other resource development at the Central Coast, and potentially a full build-out in the North Coast, and will ensure sufficient capacity to reliably meet electrification needs in the L.A. Basin, and enable the retirement of the dirtiest power plants in the L.A. Basin.

These issues are discussed in turn.

The substantial resource diversity in the proposed PSP will bring major benefits.

CalWEA strongly supports the greater resource diversity reflected in the 2023 proposed PSP, which *more than doubles* the percentage of resources other than solar and four-hour batteries (i.e., “diverse resources”) as a percentage of total non-gas capacity additions compared to either the 2021 PSP or the 2023-24 TPP Base Case portfolio, such that 45% of the clean supply portfolio in 2035 and 2039 is comprised of diverse resources additions, respectively.<sup>3</sup> As a result, due to the higher capacity factors and production profiles of the diverse resources, the 2023 proposed PSP requires *dramatically less capacity overall*. Specifically, and remarkably, the proposed PSP in 2035 requires nearly 30% less total capacity – *25,000 MW avoided* – compared to the 2023-24 TPP base case for 2035, according to our

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<sup>3</sup> Whereas 21% of total non-gas capacity additions were non-solar/four-hour battery resources in the 2021 PSP and 2023-24 TPP base case (for 2032 and 2035, respectively), the proposed PSP is comprised of 42% and 45% diverse resources additions in 2035 and 2039, respectively.

calculations.<sup>4</sup> This outcome is consistent with many other studies of high-diversity portfolios,<sup>5</sup> most recently in SCE’s extensive “Countdown to 2045” study.<sup>6</sup>

Substantial resource diversity will bring numerous important benefits that will increase the odds of California meeting its greenhouse gas (“GHG”) goals on time. Specifically, high resource diversity will:

- **Mitigate the supply chain, price, and operational risks** that will be present with a grid that is heavily reliant on solar and batteries.
- **Use significantly less land**, which will reduce risks related to limitations on, and conflicts over, land availability in solar-heavy portfolios. Offshore wind is obviously not on land, onshore wind has a very small land footprint, and geothermal is very energy-dense in its footprint.
- **Reduce environmental and public conflicts.** Using less land, and spreading impacts across land and sea, will lessen impacts concentrated in any one area, reduce challenges with public acceptance, and reduce cumulative species impacts.
- **Reduce the need for raw materials.** By reducing overall capacity requirements, a more diverse portfolio would substantially reduce the raw materials – copper, lithium, steel, cement, etc. – needed to achieve our goals, which will be sourced largely from around the world. This is a global equity issue that California should be mindful of.
- **Reduce transmission needs.** Eliminating the need for 25 GW of projects would also likely reduce transmission needs since fewer resources would require interconnection.

CAISO-interconnected resources must be more accurately mapped to promising resource areas, and the transmission backbone in PG&E’s service territory must be strengthened.

CalWEA supports the “topline” figure of 10.4 GW of CAISO-interconnected wind energy capacity in 2039 but, as further explained under Topic 3.3 on busbar mapping, CalWEA believes that several busbar mapping results for several of the RESOLVE resource areas are grossly unreasonable. Correcting the situation by fostering a strengthened transmission backbone in PG&E’s service territory is essential if the PSP’s 10.4 GW of CAISO-interconnected wind resources are to be realized.

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<sup>4</sup> The proposed PSP for 2035 includes 24,900 MW of diverse (non-solar, non-four-hour batteries) among 59,600 MW of capacity additions (42% diverse resources) This compares to 9,055 MW of diverse resources among 42,689 MW of capacity additions in the 2021 PSP for 2032 (21% diverse resources), and 17,396 MW of diverse resources among 84,849 MW of capacity additions in the 2023-24 TPP Base Case 2035 (21% diverse resources). In the proposed PSP for 2039, there are 33,700 MW of diverse resources among 74,600 MW of capacity additions (45% diverse resources).

<sup>5</sup> See CalWEA’s December 12, 2022, comments in this docket on the Staff Paper on Procurement Program and Potential Near-Term Actions to Encourage Additional Procurement at p. 5.

<sup>6</sup> Note 1 *supra*.

In summary, the 5 GW of wind resources in the Southern Nevada-Eldorado RESOLVE area is totally unrealistic and must be replaced with wind resources in Northern California and the San Joaquin Valley where significant developable wind resources, as well as solar and other renewables, exist widely. In Northern California, resources of all types were unreasonably constrained by underestimates of available existing transmission capacity and flawed transmission expansion assumptions programmed into the RESOLVE model, systematically minimizing Northern California resources. Critically, the CAISO whitepaper reflects two substantially different approaches to identifying mitigations – one for Northern California (PG&E’s service territory) and another for Southern California (SCE and SDG&E’s service territories) and the GridLiance planning areas. As a result, in the north, RESOLVE does not allow resources to be picked beyond very limited incremental deliverability to address longer-term transmission needs.

In stark contrast, the methodology enables high-capacity lines and new switchyards to access new resource areas in Southern California and GridLiance. This dichotomy is technically unsupportable and creates a strong bias against in-state wind resources, since most of the state’s remaining wind resource potential is in Northern California. If this approach is allowed to prevail, no major deliverability upgrades will occur in Northern California from the 2023-24 or the 2024-25 TPP. Thus, the effect of the proposed PSP would be to continue to promote resource development in Southern California, as occurred in the last TPP cycle, and to foster wind energy deliveries from out-of-state, without providing comparable support for in-state resources in PG&E’s northern planning areas.

As also discussed further below in Topic 3.3, correcting this untenable situation requires the Commission to locate more wind and solar resources in the Northern California and San Joaquin Basin areas and to request that CAISO draw from its 20-Year Conceptual Plan to strengthen the transmission backbone from the southern to the northern Central Valley.

A firm commitment must be made for at least 6.5 GW of offshore wind resources at the Central Coast, including the 60-MW CADEMO project, with any OSW obligation spread among all load-serving entities, and with carefully planned transmission.

If California is to count on offshore wind as a major part of its resource portfolio – as CalWEA believes is warranted based on the resource diversity benefits discussed above, the Commission must decide to go all-in, at least at the Central Coast, in this IRP cycle to drive the investments and efficiencies necessary to drive down costs. In addition, as described below, the Commission must request that CAISO build out the transmission backbone in Northern California to support at least 3 GW of OSW and onshore renewable resources in that region.

To that end, the Commission should include in the PSP 6.5 GW of OSW at the Central Coast, roughly the amount of capacity that experts believe could be accommodated in the three BOEM lease

areas, including the 60-MW CADEMO project near the Vandenberg Space Force Base (“SFB”). In addition, the Commission should include in the PSP 1.6 GW of OSW at the North Coast, and should plan to facilitate the grid interconnections necessary for OSW resources, in view of other resources in the queue. These issues are discussed in turn below.

*The Commission should include 6.5 GW of OSW at the Central Coast in the PSP*

In December of 2022, BOEM conducted an auction of three lease areas off the Central Coast and two lease areas off Humboldt Bay, generating a combined sales price of \$757 million across the five lease areas. With each lease area comprising just over 80,000 acres, this resource has the potential to be a reliable source of power for decades to come. However, given the long lead time nature of offshore wind, and complex technical challenges involved in establishing floating wind projects, there must be a clear intention to develop these projects. Investments in port infrastructure, manufacturing facilities, and job training programs will not come at the necessary scale to drive costs down if the development of the sector is approached in a piecemeal fashion. Rather, a bold and progressive approach must be taken to kickstart the commercialization of this industry.

Additionally, full development of the three lease areas off the Central Coast will unlock more than \$93 million in “bidding credit” investments into supply chain development, workforce development, and community benefit agreements. These bidding credits originated through the multi-factor auction process implemented by BOEM<sup>7</sup> for the federal lease areas. These investments will go a long way towards laying the groundwork for a robust supply chain, a well-trained workforce, and a falling price for the energy produced by offshore wind in California.

A 4.5 GW offshore wind target for the Central Coast falls well short of incentivizing the necessary investments and increases the likelihood of projects facing the sorts of supply chain challenges seen with recent East Coast projects. A 4.5 GW target for the Central Coast would also likely mean that California misses out on a significant portion of the available bidding credit investments. Conversely, a full 6.5 GW target will ensure that the maximum bidding credit allotment is utilized, and that a hub of offshore wind supply chain activity will drive costs down.

*The Commission should include the CADEMO OSW project in the PSP*

CADEMO<sup>8</sup> is a 60-MW offshore wind project consisting of four 15-MW floating turbines 2.5 miles off the coast of Vandenberg SFB, south of the Morro Bay BOEM lease area, interconnecting at the

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<sup>7</sup> For more information on the BOEM bidding credits and implementation rules, see <https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/PACW-1%20BFF%20Addendum.pdf>.

<sup>8</sup> See <https://cademo.net/>.



PG&E 115kV transmission grid at Surf Beach. Its application is undergoing a joint state-federal environmental review process, with the California State Lands Commission and U.S. Air Force as lead agencies for CEQA and NEPA, respectively. Its permit and lease decisions will be made by the State Lands Commission.<sup>9</sup>

The project is expected to be online by 2028, approximately five years ahead of the first full-scale OSW project in federal waters off Morro Bay, providing a critical window of opportunity to drive the scale-up necessary to support California fabrication of the floating platforms and development of other domestic economic content. It will test and prove systems and processes, allowing advancement of cost reductions and optimization to benefit the larger-scale deployments. It will also help to secure and build port infrastructure, develop industrial and workforce experience with the construction and assembly of complex floating platforms, and secure vessels to deploy the turbines and foundations.<sup>10</sup>

Given the tight timelines to achieve 2032 goals for full-scale projects, CADEMO could play a critical role in developing infrastructure and workforce capabilities, setting best practices for tribal relations, and providing evidence regarding the environmental impacts of a 6.5-GW build-out. All of these could help to facilitate, accelerate, and de-risk the permitting of BOEM projects.<sup>11</sup> CADEMO could also serve as an opportunity to develop central procurement contracting arrangements. For these reasons, CADEMO will help to achieve the PSP's goals for OSW and thus warrants inclusion in the PSP.

The project has met numerous significant milestones, including the following:

- recipient of High Road Training Partnership grant from the California Workforce Development Board;
- completion of the first Project Labor Agreement on the West Coast with California labor unions;
- completion of a mitigation agreement for site approval with the Department of Defense Clearinghouse; and
- completion of a Community Benefit Agreement with Santa Ynez Chumash Tribe. This is the first such agreement between an offshore wind developer and a tribe on either the West or East Coast.

*Planning grid interconnections and upgrades for Central Coast OSW*

It is important that the Commission work to ensure that sufficient capacity will be available for

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<sup>9</sup> See <https://www.slc.ca.gov/renewable-energy/offshore-wind-applications/>

<sup>10</sup> For further discussion, see CalWEA's July 7, 2022, comments in the AB 525 docket at the Energy Commission. Available [here](#).

<sup>11</sup> The marine species at CADEMO match well with those at Morro Bay, thus CADEMO provides an opportunity to develop, deploy and validate mitigation measures to be available for larger-scale deployment.

the 6.5 GW of OSW at the Central Coast. In CAISO's interconnection queue presently, OSW interconnection requests total 6.5 GW. In addition, there are about 1.5 GW of stand-alone and 1.5 GW of OSW co-located storage resources in the queue in this region. According to the CAISO's 2023 Transmission Capability Estimates that are informing the IRP process,<sup>12</sup> a total of 7.8 GW of TPD capacity is available for OSW in the region. If OSW projects can demonstrate strong procurement interest, they would be in a good position to obtain the available TPD capacity in the upcoming TPD cycle for Q14, with 1.1 GW of available capacity remaining for storage. Due to CAISO's dispatch assumptions, however, if OSW is not able to demonstrate procurement interest and 3.0 GW of storage capacity is awarded TPD capacity first, only 4.2 GW of OSW resources could be accommodated in the next TPD cycle. Thus, the Commission should work either to provide OSW projects the necessary procurement assurances to the CAISO for the upcoming TPD cycle, or request that CAISO plan to expand TPD capacity at the Central Coast.

To secure the available TPD capacity, OSW projects must be able to demonstrate strong procurement interest by the end of 2024. This appears to be unlikely under the Commission's current schedule for addressing issues related to central procurement. Therefore, CPUC intervention, in coordination with CAISO, may be needed to enable OSW developers to demonstrate sufficient procurement interest by the end of 2024 to preserve their TPD capacity allocation. For example, the CPUC could provide CAISO with assurances that it will direct the Department of Water Resources ("DWR") to procure OSW capacity if DWR has not sufficiently progressed in the procurement process by that time, as seems likely. This would enable all 6.5 GW of OSW queue applications to receive TPD capacity, leaving 1.1 GW of capacity for storage resources.

Alternatively, while planning for 6.5 GW of OSW at the Central Coast, the Commission could provide procurement assurances for two of three OSW projects, enabling them to secure currently available TPD capacity and come online in the 2032-2034 timeframe,<sup>13</sup> with the third project to be built by 2034 using additionally planned transmission capacity.<sup>14</sup> This would enable all 3.0 GW of Queue Cluster 14 (QC14) storage projects to move forward.

The CAISO's 2023 Transmission Capability Estimates show that a relatively modest policy upgrade consisting of another 500kV circuit between Diablo and Midway could be achieved within nine years. Alternatively, the proposed Diablo Canyon-L.A. Basin subsea cable, an upgrade consistent with

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<sup>12</sup> A fuller discussion of this and other issues in this subsection is contained in Section IV, below.

<sup>13</sup> 2032 is the most plausible first online date.

<sup>14</sup> To ensure that the additional transmission capacity is available by 2034, the CPUC could employ process efficiencies such as the "rebuttable presumption," enabled by AB 1373, which allows the CPUC to accept the CAISO's finding that transmission is needed rather than repeating that need determination.

the CAISO's 20-Year Outlook, would not only increase deliverability capacity at the Central Coast but would also relieve known constraints on Path 15 and Path 26, thus relieving congestion into and within the L.A. Basin. While the subsea cable would cost more, it would deliver substantially greater benefits.<sup>15</sup>

Therefore, the most efficient plan – enabling nearer-term use of available transmission resources by storage – might be for the CPUC to include in the PSP at least 8 GW of deliverability capacity at the Central Coast to enable the CAISO to plan for the Midway-Diablo upgrade or subsea cable in the 2024-25 TPP cycle, if not the current TPP cycle. The Commission would also provide procurement assurance by January 2024 (early in the CAISO's TPD cycle) for the CADEMO project and a portion of Central Coast OSW capacity, to enable two BOEM leaseholders to secure sufficient TPD capacity in the QC14 2024 TPD cycle and come online in the 2032-2034 timeframe. The additional transmission capacity approved by the CAISO in early 2025 will enable the balance of Central Coast OSW capacity to come online as early as 2034, with TPD capacity allocated in the QC15 TPD cycle, likely occurring in late-2027/early-2028. By that time, the CPUC/DWR can be expected to have provided sufficient procurement assurance for this capacity.

A fuller discussion of these issues is contained in Section IV, below.

The Commission should plan for at least 3 GW of Northern California wind, onshore and off

While the RESOLVE results, including sensitivities, do not provide support for including North Coast offshore wind in the PSP, CalWEA believes that the important benefits of resource diversity, discussed above, and efficient transmission planning, warrant planning for 3 GW of Northern California wind resources (onshore and off) in the PSP beginning in 2035. As importantly, RESOLVE is just one model with many embedded assumptions and limited capabilities and, as the Ruling notes, “there is significant uncertainty about the actual costs of several resources that the state expects to rely on in the long term, including OSW” and other resources.<sup>16</sup> If California is an active participant, rather than a bystander, in the global market for floating OSW, costs are more likely to decline to targeted levels.

Another capacity expansion model, used by SCE in its extensive “Countdown to 2045” study,<sup>17</sup> produced very different results than did the Commission's RESOLVE model. This model incorporates the 24-hourly Resource Adequacy (“RA”) methodology, adopted in 2022 by the CPUC for its RA program. Whereas RESOLVE is based on a single-hour planning reserve margin, SCE's model

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<sup>15</sup> See also the discussion regarding planning for the L.A. Basin below.

<sup>16</sup> Ruling at p. 22.

<sup>17</sup> Note 1 *supra*.

considers both capacity and energy needs across all hours of the peak load day in a given month or year.<sup>18</sup> Another very important difference is that SCE modeled an economywide scenario that addresses more stringent legislative and regulatory GHG emissions requirements by 2045, requiring a significant increase in electricity to meet higher electrification loads.

While total 2045 capacity additions are similar in the proposed PSP and SCE’s study, SCE meets the significantly higher need for GHG-free energy by using higher capacity factor (“CF”) resources like wind, offshore wind and geothermal, while retiring more gas resources. The SCE model selected higher-CF resources because, in the 24-hourly analysis, they were shown to be the most cost effective – far more so than solar and short-duration storage.<sup>19</sup> As the SCE report states, “This shift marks an improvement in economic optimization of resources for reliability purposes and is a more appropriate method for considering resources within a highly renewable electric system.”<sup>20</sup> CalWEA agrees.

Relative to the proposed PSP, the SCE study finds a similar need for onshore wind resources, an additional need for 14 GW of offshore wind, and 4 GW of “clean-firm”/geothermal resources, with almost 5 GW less gas.<sup>21</sup> Most of this additional OSW capacity would need to come from the North Coast. This additional OSW would come with more of the many resource diversity benefits discussed in section III.B, above, particularly the need to increase the state’s resource options in view of potentially much higher electricity demand than the Commission is currently contemplating. (Encouragingly, the study also demonstrated that combined energy household expenses would also decrease by about 40% by 2045.)

On the other hand, SCE used the 2022 NREL Annual Technology Baseline (“ATB”) cost estimates, which included lower OSW and four-hour battery costs and higher onshore wind and solar costs than the 2023 NREL ATB used to develop the proposed PSP. In addition, the SCE study used the older CPUC assessment of CAISO-interconnected on-shore wind resource potential, which was much lower than the assessment used for the proposed PSP.<sup>22</sup>

It seems clear that the CPUC should plan to conduct its own 24-hourly analysis, with updated values, ideally for the 2025-26 TPP, but no later than the next IRP cycle. CalWEA recommends that the

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<sup>18</sup> Note 1 *supra* (SCE study), Appendix p. 19.

<sup>19</sup> *Id.* at Figure 5 (Figure 5: Capacity Expansion Resource Cost Comparison — Relative Resource Costs for Reliability Contribution).

<sup>20</sup> *Id.* at p. 21.

<sup>21</sup> *Id.* at Table 8, comparing to Table 2 in the Ruling.

<sup>22</sup> CPUC, “Integrated Resource Planning (IRP) Proposed Portfolios for the 24-25 Transmission Planning Process (TPP) and Preliminary Busbar Mapping Workshop Energy Division Staff, slide 10 (October 20, 2023). (The CAISO-interconnected wind resource potential used for the 2021 PSP was 3,297 MW vs. 14,986 MW for the 2023 proposed PSP.)

Commission state such an intention in its decision adopting the PSP and commit to re-evaluating the need for a larger build-out at the North Coast OSW, which would entail the addition of offshore transmission, as soon as possible.

Our recommendations in Section III.C (Topic 3.3) of these comments would promote efficient transmission planning for Northern California, accommodating at least 1.6 GW of OSW from the Humboldt Wind Energy Area (“WEA”) (the same as in the 2023-24 TPP base case portfolio) and additional offshore or onshore Northern California resources.<sup>23</sup> Upgrades to the CAISO-controlled transmission grid for onshore wind and solar would involve 500-kV backbone upgrades between the newly approved Fern Road and Los Banos-area substations (via Vaca-Dixon and Tracy/Tesla). Accommodating North Coast OSW would additionally require connecting the Humboldt Bay area to the Fern Road Substation.<sup>24</sup> Based on rough calculations, CalWEA believes that such an upgrade can readily transfer up to 3 GW of wind from the Humboldt WEA and/or onshore wind resources to the Greater Bay and other load centers in California. A subsea cable from Humboldt Bay to the Bay Area would add an additional 2 GW of capacity, creating a network loop available to all resources.

Upgrading Path 26 via subsea cable between the Central Coast and the L.A. Basin, as CalWEA also recommended below, would also support a full-scale build-out of multiple North Coast offshore WEAs by adding deliverability capacity to L.A. load centers, assuming linkage between the Bay Area and the Central Coast is also provided. Ultimately, CalWEA recommends an offshore network along the coast of California to support a full-scale build-out of North Coast OSW resources.

Finally, we note that, based on the Commission’s 2023-24 TPP base case portfolio, CAISO is already including 1.6 GW of North Coast offshore wind in its current TPP cycle, which will trigger upgrades to the area. As just discussed, it would be more efficient to plan for 3 GW from Northern California. In addition, it would be very important, should the Commission add North Coast OSW to its 2023 PSP, to indicate to CAISO its intention to direct procurement of these resources relatively soon (as discussed above for Central Coast OSW projects), so that the OSW projects will be in a position to reserve the TPD capacity that would become available so that it is not allocated to other types of projects in QC14 and QC15 that are able to demonstrate procurement interest.<sup>25</sup>

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<sup>23</sup> In other words, for generally the same transmission investment for 1.6 GW of OSW, the state can benefit from twice as much offshore (and/or onshore) wind generation capacity. RESOLVE’s simple modeling of the transmission system does not capture such critical factors.

<sup>24</sup> Schatz Energy Research Center, “California North Coast Offshore Wind: Transmission Alternatives” at Slide 10 (Option 1) (May 25, 2022). Available [here](#).

<sup>25</sup> Resources anywhere along the transmission path could use the capacity planned for OSW.

The Commission should request that CAISO plan for reduced thermal RA capacity in the L.A. Basin

As CalWEA stated in its August 4, 2023, informal comments on busbar mapping, staff's methodology paper (at p. 34) states that "CPUC staff will assemble a list that does not create additional transmission needs." This is antithetical to the purpose of the IRP-TPP process. As stated in CalWEA's June comments on the draft Inputs & Assumptions document, SB 887, adopted last year, requires the Commission to provide the CAISO with transmission-focused guidance including "resource projections that, combined with transmission expansions, are expected to substantially reduce, no later than 2035, the need for non-preferred resources in local capacity areas." CalWEA reasonably interprets "need" as the need for capacity. The IRP process must therefore intentionally plan for at least the *ability* to replace gas resources with an optimal combination of transmission and local storage (along with charging resources).

Removing gas resources from the PSP for transmission planning purposes need not result in the retirement of any gas capacity. As the Inputs & Assumptions report notes, RESOLVE modeling does not assess whether gas capacity should retire.<sup>26</sup> Similarly, as the Ruling states in reference to the sensitivity portfolios, "Although the natural gas plants were not included in LSE plans does not necessarily guarantee that the facilities will retire, because the Commission or the CAISO may need to take action to keep them online for system or local reliability purposes."<sup>27</sup> However, without such planning, our dependence on gas generation will be perpetuated.

Moreover, as SCE's Countdown to 2045 economywide study indicates, substantially more electricity than the PSP is planning for (but, as discussed above, not necessarily capacity) may be needed in 2045 due to electrification of vehicles and buildings. Without additional transmission capacity into the L.A. Basin, the gas fleet would have to operate far more frequently and, even still, are likely to be insufficient to ensure reliability.<sup>28</sup> (With a diverse resource fleet, as noted above, the SCE study shows that more gas capacity can be retired than is reflected in the proposed PSP.)

The Commission should therefore request that CAISO reduce thermal RA capacity in the L.A. Basin in its studies that inform transmission planning, in *both the current* and next TPP cycle. In addition, as discussed in section III.C (Topic 3.3) of our comments, the Commission should request that the CAISO draw upon its 20-Year Transmission Outlook to plan Path 26 upgrades, which were not

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<sup>26</sup> Inputs & Assumptions 2022-2023 IRP (October 2023) at pp. 30-31.

<sup>27</sup> Ruling at pp. 23-24.

<sup>28</sup> CAISO projections for 2032 show that local resources are already close to the minimum needed to maintain reliability. See CAISO 2022-23 TPP Report, Appendix J at pp. 111-112.

directly modeled in RESOLVE or the busbar mapping process, despite the need for upgrades to deliver Northern California resources to Southern California load. Path 26 upgrades will also facilitate offshore wind and other resources at the Central Coast, as well as a substantial build out of the North Coast wind resources.

### **C. Topic 3.3. - Busbar Mapping**

As noted above in section III.B (Topic 2.1) on the recommended portfolio, CalWEA supports the “topline” figure of 10.4 GW of CAISO-interconnected wind energy capacity in 2039. CalWEA also believes that the specific busbar mapping results for several of the RESOLVE resource areas are reasonable – but for several others they are grossly unreasonable. The results must be corrected if the PSP’s 10.4 GW of CAISO-interconnected wind resources are to be realized.

CalWEA supports the results in the Baja California, Greater Imperial, and Tehachapi RESOLVE areas. In Baja, there is more than enough in the CAISO queue to support the 2,473 MW that was mapped to this region<sup>29</sup> and CalWEA is aware that numerous developers are active in the area. In Greater Imperial, 133 MW is a reasonable, if conservative, estimate given the potential of the strong Baja resource area that extends northward into San Diego and Imperial Counties; wind developments and development activity exist in this area. In Tehachapi, developable greenfield areas remain available, and repowering of post-2010 projects and older repowered projects could occur at higher hub-heights, boosting production.

We strongly recommend, however, that the 5 GW of wind resources in the Southern Nevada-Eldorado RESOLVE area be replaced with wind resources in Northern California and the San Joaquin Valley. As discussed in detail below, the resource potential in the Southern Nevada-Eldorado RESOLVE was greatly overestimated. In Northern California, resources of all types were unreasonably constrained by flawed transmission expansion assumptions programmed into the RESOLVE model, systematically minimizing Northern California resources. Finally, the overall wind resource was underestimated and then improperly screened for land-use feasibility and environmental impacts.

Correcting the situation requires relocating wind resources from the Southern Nevada-Eldorado RESOLVE area to the Northern California and San Joaquin Basin areas and requesting that CAISO draw from its 20-Year Conceptual Plan to strengthen the Central Valley transmission backbone.

Each of these issues is discussed below.

#### Resource potential was overestimated in the Southern Nevada - Eldorado area.

In the Southern Nevada-Eldorado RESOLVE resource area, which is comprised almost entirely

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<sup>29</sup> There are 2,594.3 MW in the queue clusters prior to QC15 and 1,328.7 MW in QC15.

of federal land, the 5-GW wind resource estimate is far too high. Over the past 25 years, five developers, to CalWEA's knowledge, have made concerted efforts to seek permits for three projects in what can be presumed to be among the most promising locations in the area on both sides of the border. All projects were abandoned after many years of effort and, undoubtedly, the expenditure of considerable development capital. Generally, developing on public lands is difficult, and getting harder, as evidenced by the fact that just 1% of the nation's wind energy is on federal lands.<sup>30</sup>

The Searchlight project was approved by BLM and the U.S. Fish & Wildlife Service in 2013, but the developer abandoned the 200-MW project in 2017, rather than appeal the second of two negative federal court rulings in a challenge to the EIS brought by environmental groups.<sup>31</sup> The Castle Mountain Project, adjacent to an abandoned open-pit goldmine on the California side of the border, was killed by the new Castle Mountain National Monument, followed by the Desert Renewable Energy Conservation Plan ("DRECP"). The third project, the 500-MW Crescent Peak project, was effectively denied a BLM permit in 2018 when BLM was instructed by Department of Interior Secretary Zinke not to process the application. A scaled-down version of that project, the Kulning project, recently withdrew its 300-MW CAISO queue application despite its location in an area that BLM had designated as an area "open to wind energy" in 2019 because it was subsequently encompassed in the footprint of a new national monument.<sup>32</sup>

In addition to this inauspicious history, this area is fraught with challenges, including:

- Limited remaining areas with developable resources. Our analysis shows that there are roughly 25-30 square miles of developable resources left in southern Nevada, all of which is in Clark County where the land is fragmented and much of the terrain is rugged and complex. Many resources in the southern California area were put off limits by the DRECP and the Mojave National Park.
- Numerous potential conflicts with Nellis Air Force Base, other Department of Defense activities, and other airspace. These include DoD radar, various Military Training Routes, airspace and radar within the Nevada Test and Training Range, and a proposed Nevada Supplemental Airport whose airspace is being conservatively guarded.

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<sup>30</sup> Sammy Roth, "Boiling Point: Biden at the bat," *L.A. Times* newsletter (Nov. 9, 2023) (citing JC Sandberg of American Clean Power for the 1% figure and discussing additional BLM land-use plans that will make development on BLM lands in the West more difficult).

<sup>31</sup> "Environmentalists just killed a wind farm near Las Vegas," *Desert Sun* (April 21, 2017). Available [here](#).

<sup>32</sup> "BLM deals blow to wind farm competing with would-be monument" *Greenwire* (Dec. 9, 2021). Available [here](#).



- Numerous environmental conflicts, including presence of the Mojave desert tortoise; BLM Areas of Critical Environmental Concern; and proximity to numerous protected areas including the Mojave National Park and Death Valley in California, and the McCullough Wilderness, Red Rock National Conservation Area, Lake Mead National Recreation Area, and the newest Avi Kwa Ame National Monument in Nevada.
- Finally, while transmission upgrades in the previous TPP cycle increased deliverability capacity from substations in California border areas to load centers (presumably a major reason why wind was mapped to this area), transmission to those substations for import to California are expected to be congested once out-of-state resources using “subscriber” gen-tie lines bring power into the Eldorado substation. Related, we note that, if there were good prospects for developing wind in this area, we would likely have seen applications submitted in QC15 as soon as the Southern California deliverability upgrades were approved, but there are none.

For these reasons, CalWEA recommends that the wind resource potential in the Southern Nevada-Eldorado resource area be reduced to zero, and certainly not more than 500 MW, which would be difficult to achieve.

Northern California resources of all types were unreasonably constrained by flawed transmission expansion assumptions.

The CEC’s Core Land-Use Screen shows tremendous wind resource potential in California, particularly in the San Joaquin Basin<sup>33</sup> and Northern California areas,<sup>34</sup> after screening out considerable resource areas to address “several state policy priorities, including sustaining agriculture and protecting natural lands that support biodiversity ... [and] incorporat[ing] statewide information about intact landscapes.”<sup>35</sup>

In the final Inputs & Assumptions document,<sup>36</sup> the wind resource potential in these areas was diminished to 5.6 GW primarily because of a decision to constrain resources to what exists relatively close to substations and, secondarily, because a conservative land-use factor was used and arbitrary

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<sup>33</sup> This is the “Central Valley-Los Banos” RESOLVE area.

<sup>34</sup> This is the “Northern California” and “Solano” RESOLVE areas (Solano extends eastward into the south Sacramento Valley and Delta region).

<sup>35</sup> See California Energy Commission Transmission, and Environmental Protection Division, “Proposed Updates to Land-Use Screens for Statewide Renewable Resource Potential Siting,” Slide 26: “Draft Land-Use Screens – Wind Result Final” (March 13, 2023) and *Land-Use Screens for Electric System Planning* (Sept. 2023) at p. 11. The potential in these areas was estimated at 56 GW; however, this reflected an assumed 20% minimum capacity factor (CF) threshold, rather than the 28% CF ultimately (and more appropriately) used. No comparable capacity figure was provided under the 28% CF threshold.

<sup>36</sup> Note 26 *supra* (Inputs & Assumptions) at p. 59.

environmental factors were applied, as discussed below. Then, RESOLVE and the busbar mapping process – informed by the upgrade assumptions in the CAISO’s transmission whitepaper<sup>37</sup> for Northern California and the San Joaquin Basin – was programmed to not trigger major upgrades to solve transmission constraints, which would also provide access to wind resources in a broader area. As a result, RESOLVE placed wind and solar resources only in low-voltage areas,<sup>38</sup> thus confining development to areas where it may not, in reality, be possible to develop or where development may come at a much higher cost. Further, if development in this pattern were to materialize, it would eventually push the need for 500-kV upgrades. Instead, therefore, it would be more effective and efficient to focus on strengthening the 500-kV system in these areas, which would open a much broader area for all carbon-free resources in addition to wind.

Several wind developers have attempted to develop wind resources in Northern California in the past, as evidenced by met tower installations and queue applications, and current queue positions exist in that area (in the NV Energy queue) and in the San Joaquin Basin. However, development activity has been limited due to the lack of transmission infrastructure.

To elaborate on the flaws of the CAISO’s whitepaper that informs the RESOLVE model and underlies busbar mapping, first, the estimates are out-of-date, not reflecting the methodology and the incremental Area Deliverability Network Upgrades (ADNU) already approved when the whitepaper was issued, which underestimates available transmission across the state.<sup>39</sup> CAISO’s estimates of deliverable capacity should be substantially higher in many areas given the approved upgrades in 2021-2022 and 2022-2023, including PG&E (Greater Bay Area), SCE (North of Lugo, East of Pisgah, Eastern) and SDG&E.

Second, the CAISO whitepaper reflects two substantially different approaches to identifying mitigations – one for Northern California (PG&E’s service territory) and another for Southern California (SCE and SDG&E’s service territories) and the GridLiance planning areas. In the north, as noted above, the mitigations being considered are more narrowly focused on overloads that provide little to no incremental deliverability, and RESOLVE does not allow resources to be picked beyond that limited

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<sup>37</sup> CAISO, “Transmission Capability Estimates for use in the CPUC’s Resource Planning Process” (June 28, 2023). Whitepaper and related documents available [here](#).

<sup>38</sup> CalWEA’s understanding was confirmed by CPUC staff via email.

<sup>39</sup> RESOLVE picks up resources to absorb incremental deliverability from these approved upgrades since the cost is zero. However, this approach could under-estimate the incremental deliverability. For example, a Manning upgrade increases deliverability at the Gates Bank constraint. But CAISO estimates do not show the benefit.

incremental deliverability to address longer-term transmission needs.<sup>40</sup> The Path 26 constraint was not directly modeled in RESOLVE or the busbar mapping process,<sup>41</sup> despite the need for upgrades to deliver Northern California resources to Southern California load; Path 26 upgrades would also facilitate offshore wind and other resources at the Central Coast, as well as a substantial build out of North Coast OSW resources.<sup>42</sup>

In stark contrast, in the south, the methodology enables significant incremental deliverability capacity via new high-capacity lines and new switchyards to access new resource areas. This inexplicably dichotomous approach biases the results against in-state wind resources, since most of the state's remaining wind resource potential is in Northern California.<sup>43</sup> If this approach is allowed to prevail, no major deliverability upgrades will occur in Northern California from the 2023-24 or the 2024-25 TPP, depriving the main wind resource areas of the needed transmission capacity to reach California's load centers.<sup>44</sup> Thus, as noted earlier, the effect of the proposed PSP would be to continue to promote resource development in Southern California, as occurred in the last TPP cycle, and to foster wind energy deliveries from out-of-state, without providing comparable support for in-state resources in PG&E's northern planning areas.

Whatever the reason for the difference in approach, the CPUC should not allow this flawed methodology to continue to distort its resource plan and subsequent transmission planning.

Needed corrections: more wind and solar resources should be located in the Northern California and San Joaquin Basin areas, and the Commission should request CAISO to draw from its 20-Year Conceptual Plan to strengthen the transmission backbone from the southern to the northern Central Valley.

Given the benefits of resource diversity and geographic diversity, discussed in section III.B (Topic 2.1), and the very substantial wind and solar resources available in the San Joaquin Basin and Northern California described above, the Commission should preserve the 10.4 GW of wind resources in the proposed PSP for 2039, but replace 5 GW of wind resources in the Southern Nevada-Eldorado area that are highly unlikely to be developed with wind resources in these more promising areas to the north, and similarly place a portion of the solar resources currently concentrated in Southern California desert

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<sup>40</sup> Instead of reconductoring numerous 115kV lines, for example, a better approach would be to look at the area heuristically and build collector substations and back-bone transmission lines that serve long-term needs.

<sup>41</sup> Staff noted in an email to CalWEA that Path 26 "is something we take a more qualitative approach to."

<sup>42</sup> Also see section III.B addressing transmission planning for OSW.

<sup>43</sup> Unfortunately, the DRECP took considerable wind energy resources in southern California resources off the table.

<sup>44</sup> As Golden State Clean Energy pointed out in its July 19, 2023, comments on the CAISO's whitepaper, the whitepaper generally does not include significant types of upgrades in the Fresno/Kern areas, for example, whereas areas like SCE Eastern include several new high voltage lines for the IRP to consider.

areas in the north as well.<sup>45</sup>

Given the artificial and inappropriately limited transmission upgrade options embedded in the RESOLVE model for Northern California, and the qualitative approach being taken with major constraints, the Commission should request that CAISO draw upon its 20-Year Transmission Outlook to plan 500-kV network upgrades along the California-Oregon Intertie between the Fern Road and Los Banos-area substations (via Vaca-Dixon and Tracy/Tesla). These upgrades will also strengthen the grid in the East Bay. Adding linkage to Humboldt Bay, as discussed in section III.B (Topic 2.1) above, would provide access to the OSW resources in that area and would, in total, accommodate 3 GW of wind resources, onshore and/or offshore.

Given the wind, solar and geothermal resources in and around Lassen County, however, there is also a need for a 500kV transmission path from Fern Road eastward to Lassen County that would connect into NV Energy’s Greenlink transmission project now underway. This would enable the overall system to support more than 3 GW<sup>46</sup> and increase the reliable operation of the entire Western Electricity Coordinating Council (“WECC”) region. This upgrade can be done by upgrading existing low-voltage transmission corridors.

All the above backbone upgrades would break open the 135-GW of solar potential and 5.6 GW of wind potential (which was conservatively assessed, as discussed below) just as the Tehachapi Renewable Transmission Project and Sunrise Powerlink opened new regions for renewable energy development and played a major role in California’s success in meeting its clean energy goals to date. Given the vast onshore wind, solar and geothermal resources in these areas, the Commission can rely on developers and permitting processes to locate projects in suitable locations, with collector substations planned in CAISO’s generation interconnection process.<sup>47</sup>

The overall wind resource was underestimated.

CalWEA found it difficult to fully understand how and what determinations were made throughout the complex RESOLVE and opaque busbar mapping processes.<sup>48</sup> Nevertheless, it’s clear

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<sup>45</sup> Geothermal resources could also be increased in Northern California, given the 850 MW of potential shown in the Final I&A document after applying techno-economic and environmental screens. In any case, these resources would benefit from a strengthened PG&E system.

<sup>46</sup> Studies would be needed to determine how much additional capacity could be integrated under this plan.

<sup>47</sup> These backbone upgrades would be approved by CAISO in May 2025, enabling developers to submit applications in these areas in Queue Cluster 16. We note that, were CAISO to reform the N-2 criterion in its deliverability methodology, some currently queued resources could move ahead immediately.

<sup>48</sup> In an October 20, 2023, webinar, CPUC staff described the workgroup process, involving staff from the CPUC, CEC and CAISO, as “an iterative process consisting of mapping, assessing, and re-mapping” that is far less “less linear and clear-cut” than depicted in the flowchart graphic, requiring “constant coordination between staff” and “repeated rounds of iterative mapping” to get the criteria “to align to the best extent

that, at multiple points in the process, the enormous developable wind resource potential in Northern California and the San Joaquin Valley was substantially underestimated through the development of the techno-economic and environmental screens and in the iterative busbar mapping analysis. While the CEC-CPUC analysis under this unduly conservative screening process still shows that over 5 GW of developable wind resource potential exists in these areas, the underestimation of these resources provides further confidence that at least 5 GW of Southern Nevada-Eldorado area wind can be successfully replaced with wind resources in these northern regions.

The underestimation of wind resources occurred for numerous reasons that CalWEA identified in informal comments<sup>49</sup> but that were not addressed. Most importantly:

- The NREL methodology used to estimate in-state wind resource potential was too coarse to capture potentially developable resources and thus prone to missing ridge-based resources and complex terrain, which characterize much of California’s wind resources.
- A wind land-use density factor of 40 acres/MW was used, while CalWEA recommended a 25 acre/MW density factor, given the 4.5-7 MW ratings of the wind turbine generators available for the rest of this decade and recent experience with California projects. Thus, the available land can support more wind capacity than was assumed.
- CalWEA emphasized that the land-use factor used to estimate the wind generation capacity from available land should not be used to approximate terrestrial environmental impacts, but it appears that it was. This is a gross error, given that wind projects typically permanently disturb less than 3% of the land-area requirement, can be carefully micro-sited to avoid sensitive areas within the lease area, and remaining areas within wind project boundaries can support sensitive species and wildlife movement, or agricultural production, ranching, or other productive co-uses of the land.

Busbar mapping improperly assessed project-level impacts.

CalWEA appreciated the disclaimer that was applied to the Energy Commission’s Land-Use Screen report,<sup>50</sup> which states:

“These geospatial land-use screens are intended to inform high-level estimates of renewable resource technical potential for electric system planning and *should not be*

possible.” Clearly, this process was not transparent to outside parties.

<sup>49</sup> See CalWEA’s Informal Comments on Energy Division’s Draft 2023 Inputs & Assumptions (June 26, 2023) and on Draft Updates to the Busbar Mapping Methodology (August 4, 2023).

<sup>50</sup> Hossainzadeh, Saffia, Erica Brand, Travis David, and Gabriel Blossom. 2023. Land-Use Screens for Electric System Planning: Using Geographic Information Systems to Model Opportunities and Constraints for Renewable Resource Technical Potential in California. California Energy Commission. Publication Number: CEC-700-2022-006-F-REV. (Disclaimer at the bottom of page 1 and on the associated slide presentation. Emphasis added.)

*used, on their own, to guide siting of generation projects nor assess project-level impacts.”*

And yet, that is exactly what the busbar mapping process proceeded to do when it attempted to assess *project-level impacts* around existing substations based on a few criteria on a simple scale of 1-5. As well-intentioned as this effort was, and as hard as staff worked on what was clearly a very time-consuming and difficult process, it is simply no substitute for the years-long screening and permitting processes that each real project goes through, with developers spending millions of dollars on species studies, landowner discussions, community outreach, etc.

The result of this process was that many resource areas were screened out or downgraded based on a desktop analysis and subjective staff judgments. Thus, for example, many Northern California wind resources were de-prioritized based on assumed “non-alignment” with the Core Land-Use Screen and ACE terrestrial connectivity areas despite the small land-disturbance footprint that enables compatibility with such areas, as noted in the preceding subsection. Many of these areas were also ranked low due to high-fire-risk conflict, despite CalWEA’s explanation of how wind projects reduce fire risk.<sup>51</sup> In any case, potential fire risk is thoroughly evaluated and mitigated in the permitting process.

The busbar mapping process also constrained available wind resources to those that are within 15 or 20 miles from an existing substation. CalWEA advised that large resource areas (300+ MW) may warrant gen-ties up to 40 miles long and the tapping of transmission lines with new switching stations. Further, as discussed above, the RESOLVE model should have been able to select transmission upgrades in Northern California in the same way as they were allowed in Southern California. In sum, the Tehachapi Renewable Transmission Project would never have been built under this process.

#### **D. Topic 5.1. - Potential Additional Procurement to Allow Extension for LLT Resources**

CalWEA takes no position on the possible three-year extension of the LLT resources previously ordered for 2028. However, we note that the 60-MW CADEMO OSW project that we advocate be included in the PSP for 2028 (see discussion in Section III.B, above), would contribute to system reliability in that year. The Ruling notes that granting the extension would leave the system within the 0.1 LOLE reliability standard for the year 2028, in a tight capacity market, and that “it is likely not prudent to plan for exactly a 0.1 LOLE.”<sup>52</sup> Thus, CADEMO’s added capacity, though limited, would be helpful.

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<sup>51</sup> *Supra* note 49 (August 4 CalWEA comments).

<sup>52</sup> Ruling at pp. 47 and 48.

#### IV. COMMENTS ON ADDITIONAL TOPICS

CalWEA provides these supplemental comments on coordinating transmission interconnections and procurement for Central Coast resources, as discussed under Section III.B (Topic 2.1) above, under the subheading “*Planning grid interconnections and upgrades for Central Coast OSW.*”

##### Resource Potential & Interconnection Status

In CAISO’s interconnection queue, offshore wind interconnection requests at 500-kV Central Coast substations total 6.5 GW,<sup>53</sup> roughly the amount of capacity that experts believe could be accommodated in the three BOEM lease areas:

- CAISO has already awarded Transmission Planning Deliverability (TPD) capacity to a 1-GW OSW applicant in Queue Cluster 13 (QC13), interconnecting at the Diablo 500kV substation. However, the applicant secured its TPD capacity only temporarily with its balance sheet, rather than a PPA, and therefore, based on CAISO deliverability retention protocols, will have to show a PPA within a few years or relinquish the capacity.
- In QC14, three applications total 4 GW at the Diablo 500kV substation or the Diablo-Gates 500kV line (requiring a future Morro Bay 500kV substation). Based on CAISO’s protocols, these applicants will need to show a PPA in a year or two or will lose their deliverability capacity.
- Also in QC14, there is one application for 1.5 GW at the Moss Landing substation.

The QC14 applications could secure TPD capacity in the next TPD allocation cycle in the January to May/June 2024 timeframe.

Additionally, the 60-MW CADEMO project in state waters (discussed in section III.B) is pending in PG&E’s WDAT queue; it will go through the same CAISO process to get deliverability, competing for available TPD capacity at 115kV in the Kern area.

##### Available TPD Capacity at the Central Coast

The CAISO’s 2023 Transmission Capability Estimates provided to the CPUC for its IRP process indicate that there is a total of 7.8 GW of TPD capacity available for offshore wind at the Central Coast: 6.3 GW at the Diablo Canyon 500kV substation (and/or a new Morro Bay 500kV substation<sup>54</sup> in the

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<sup>53</sup> In addition, there is one application for 606 MW at the Morro Bay 230kV substation, where no deliverability is expected to be available in QC14.

<sup>54</sup> The transmission capacity currently used by the nuclear power plant is assumed to be available in this analysis. Even so, a new substation at Morro Bay would be required if PG&E continues to object to the use of Diablo after the nuclear units retire.

same generation pocket) and at least 1.5 GW of TPD capacity at Moss Landing<sup>55</sup> -- ostensibly more than enough to accommodate all 6.5 GW in the QC14 applications and the QC13 applicant with a tentative hold on TPD capacity.

This appears to be an overestimation, however, because approximately 3 GW of storage resources (1.5 GW of stand-alone and 1.5 GW OSW co-located) are competing for the TPD capacity in effectively the same generation pocket that OSW would also need, potentially leaving as little as 4.2 GW of capacity for OSW if storage is awarded TPD capacity first, due to CAISO's dispatch assumptions which assume up to 100% of the installed capacity for storage resources versus 83% for OSW. This would leave a 2.3 GW deficit of the 6.5 GW of capacity that may be needed for OSW. Further, we understand that CAISO does not account for flow constraints on Path 15 in its deliverability assessment, which will also impact TPD capacity for effectively the same generation pocket. If Path 15 is considered in the analysis, there may be further limitations on the amount of deliverability capacity for OSW, absent upgrades on this path to deliver energy from the Central Coast to Southern California.<sup>56</sup>

Availability of TPD capacity for CADEMO may depend on the reforms that CAISO adopts in its initiative on its deliverability methodology.<sup>57</sup>

#### Two Possible Pathways for OSW Leaseholders to Obtain TPD Capacity

CalWEA's analysis shows that the QC14 OSW applications are well-positioned to obtain most of the available TPD capacity in the 2024 TPD allocation process because they exist in a generation pocket with strongly available TPD capacity and relatively limited competition; however, they must secure their TPD capacity by the end of 2024. Assuming the four QC14 applicants have site control via BOEM leases (or will eventually have site control, if the queue position is sold to a leaseholder), they could obtain initial TPD capacity allocations in May/June 2024, which must then be secured by late-2024/early-2025 by showing a PPA, or by demonstrating that they are in active negotiations for a PPA,

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<sup>55</sup> "Transmission Capability Estimates for use in the CPUC's Integrated Resource Planning Process" and "Attachment B2 – PGE Constraint Boundary Substation List." Available at: <https://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=03DCF912-0ECF-4CF9-A304-A05F4ED5B2CD>. CAISO estimated 5,203 MW of deliverability capacity, which equates to 6,268 MW installed OSW capacity at the assumed 0.83 capacity factor that CAISO is now using.

<sup>56</sup> Note that CAISO confirmed to CalWEA that its analysis assumed that the transmission capacity for FCDS is the lower of the values from the HSN and SSN tests, and that no SSN result was significantly lower than the HSN results. Therefore, CAISO's proposed reform of eliminating the SSN test is not likely to significantly increase available capacity but could improve it somewhat. Were CAISO to relax its N-2 assumption, as CalWEA has advocated in the CAISO's current stakeholder proceeding on its deliverability methodology, this reform would not significantly increase available TPD capacity at the Central Coast north of, and including, the Diablo substation.

<sup>57</sup> Whether CAISO adopts a deliverability methodology reform for its N-2 criterion may have a significant impact around the Vandenberg SFB where CADEMO would interconnect.



or have been placed on an active shortlist to potentially receive a PPA.<sup>58</sup> The same would be true for CADEMO, if TPD capacity becomes available as a result of CAISO’s deliverability reforms.

The potential for OSW applicants to be able to secure a PPA, or demonstrate progress towards one by the end of 2024, appears to be unlikely, given that the Commission is not planning to issue a decision on the Central Procurement Entity (CPE) and other “long lead time” policies until an undetermined time in 2024,<sup>59</sup> with follow-on activity and possible activation of DWR as the CPE sometime thereafter.

Therefore, CPUC intervention, in coordination with CAISO, may be needed to enable OSW developers to demonstrate sufficient procurement interest by late-2024/early-2025 to preserve their TPD capacity allocation. (The QC13 project may have an additional year or so to demonstrate procurement interest, depending on CAISO’s requirements, but may also require such intervention.) For example, the CPUC could provide CAISO with assurances that it will direct DWR to procure this OSW capacity if DWR has not sufficiently progressed in the procurement process, as seems likely.

Absent such CPUC intervention, one or both storage projects in pre-QC15 queues may acquire TPD capacity because they can come online in time to satisfy near-term RA needs, and thus may be likely to acquire PPAs once TPD allocations are made, “using up” 3.6 GW of otherwise available deliverability capacity for OSW at the Central Coast (again, due to CAISO’s dispatch assumptions). However, approximately 4.2 GW of capacity would remain available for Central Coast OSW (assuming a CAISO Path 15 analysis does not reduce that available capacity).

Another pathway, one that would not require OSW projects to tie up most of the 7.8 GW of TPD capacity at the Central Coast for eight or more years, would entail the first two OSW projects to use currently available TPD capacity to come online in the 2032-2034 timeframe, with the balance of additional needed capacity to be built by no later than 2034,<sup>60</sup> enabling 3 GW of QC14 storage projects to move forward. While 2024 TPD capacity allocations would provide developers with greater certainty, that certainty could also be provided with a CPUC decision to include 6.5 GW of Central Coast OSW and the CADEMO project in the 2023 PSP, with a commitment to a near-term DWR procurement process, and inclusion of 8 GW of total capacity in the PSP at the Central Coast to drive the approval of needed transmission upgrades in the CAISO’s 2024-25 TPP cycle.

In fact, the CAISO’s 2023 Transmission Capability Estimates show that a relatively modest policy upgrade consisting of another 500kV circuit between Diablo and Midway (addressing the

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<sup>58</sup> Applicants are no longer able to temporarily secure TPD capacity via balance sheet.

<sup>59</sup> Note 2 *supra* (Amended Scoping Ruling).

<sup>60</sup> The CPUC could employ efficiency measures such as the “rebuttable presumption” enabled by AB 1373, enabling the CPUC to accept the CAISO’s finding that transmission is needed rather than repeating that need determination.

limitation at Gates) could be achieved within nine years at a cost of \$830 million, enabling approximately 5 GW of nameplate offshore wind capacity.<sup>61</sup> Alternatively, the proposed Diablo Canyon-L.A. Basin subsea cable, at an estimated cost of \$2 billion,<sup>62</sup> would not only increase deliverability capacity at the Central Coast but would also relieve known constraints on Path 15 and Path 26, thus relieving congestion into and within the LA Basin. While the subsea cable would cost more, it would deliver substantially greater benefits. Approving the subsea cable as a policy upgrade to accommodate Central Coast resources may, however, require CAISO to break with its traditional deliverability assessment, wherein Central Coast resources are considered solely when meeting demand in PG&E's service territory. Instead, CAISO should set up additional study cases where the deliverability of OSW resources, as well as other resources in the same generation pocket, is tested against the ability of these resources to meet demand in the LA Basin.

Therefore, the most efficient path – enabling nearer-term use of available transmission resources – would be for the CPUC to include in the PSP at least 8 GW of FCDS capacity at the Central Coast (of any resource type) to support CAISO planning for the Midway-Diablo upgrade or subsea cable in the 2024-25 TPP cycle, while also taking action to provide procurement assurance by January 2024 (early in the CAISO's TPD cycle) for the CADEMO project and a portion of Central Coast OSW capacity so that two BOEM leaseholders can secure sufficient TPD capacity in the QC14 2024 TPD cycle to enable the projects to come online in the 2032-2034 timeframe. The additional transmission capacity approved by the CAISO in early 2025 will enable the balance of Central Coast OSW capacity, which can remain in the queue, to come online as early as 2034, with TPD capacity allocated in the QC15 TPD cycle, likely occurring in late 2027/early-2028. This would allow storage resources in the same generation pocket to attain deliverability for their earlier CODs. By that time, the CPUC/DWR can be expected to have provided sufficient procurement assurance for this capacity.

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<sup>61</sup> CAISO's Excel spreadsheet shows 4.1 GW of capacity, which was calculated assuming 100% dispatch. At CAISO's revised dispatch assumption of 83%, 5 GW of OSW capacity would be enabled. Further reforming the assumed OSW capacity factor to more closely approximate expected production may enable additional capacity.

<sup>62</sup> As stated in CAISO's previous TPP cycles.

Respectfully submitted,

/s/ Nancy Rader

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***On behalf of the California Wind Energy  
Association***

November 13, 2023

## VERIFICATION

I, Nancy Rader, am the Executive Director of the California Wind Energy Association. I am authorized to make this Verification on its behalf. I declare under penalty of perjury that the statements in the foregoing copy of “California Wind Energy Association Comments on Proposed 2023 Preferred System Plan and Transmission Planning Process Portfolios” are true of my own knowledge, except as to the matters which are therein stated on information and belief, and as to those matters I believe them to be true.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 13, 2023, at Berkeley, California.

/s/ Nancy Rader  
Nancy Rader  
Executive Director  
California Wind Energy Association