BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop an Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements.	Rulemaking 16-02-007 (Filed February 11, 2016)

INFORMAL COMMENTS OF THE CALIFORNIA WIND ENERGY ASSOCIATION FOLLOWING THE DECEMBER 16, 2016, WORKSHOP ON THE REFERENCE PLAN FOR THE IRP-LTPP PROCEEDING

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On behalf of the California Wind Energy Association

January 13, 2017

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Pursuant to the December 27, 2016, email from Forest Kaser of the California Public Utilities Commission's ("CPUC" or "Commission") Energy Division staff, the California Wind Energy Association ("CalWEA") submits these informal comments on the Energy Division's questions posed after the December 16, 2016, Workshop on the Reference Plan for the IRP-LTPP Proceeding.

In general, we are pleased to see that the approach has been considerably simplified compared to the approach that was being contemplated in October, as CalWEA and several other parties recommended in earlier comments. However, we believe it is still unnecessarily complex and can readily be simplified as follows. Workshop slides 33 and 34 contain, in a nutshell, the appropriate approach: there should be one central future and perhaps one or two additional futures to evaluate major uncertainties, which will produce optimum plans, one for each future; sensitivities should be used to determine whether various other objectives can be met at a reasonable cost. What are now labeled "Candidate Plans" should be evaluated as sensitivities (in the case of bulk storage or advanced demand response) or, better yet, sensitivities should be eliminated in favor of capturing additional information in the supply curves for each resource. In the case of out-of-state wind, information can be taken (after public comment) from RETI 2.0 and other sources to build up the supply curve of resources for use in all Futures, as we discuss below.

Question 1

In the December 16 workshop, staff presented a matrix of candidate plans and sensitivities on slide 40 of the scenario development presentation (http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442451901). A modified version of that table is presented below that assigns unique alphanumeric label to each combination of candidate plan and sensitivity.

Sensitivity		Candidate Plan			
		A Base	B OOS W	C Bulk ST	D Adv DR
1	Central	A01	B01	C01	D01
2	BTM PV-High	A02	B02	C02	D02
3	BTM PV-Low	A03	B03	C03	D03
4	EE	A04	B04	C04	D04
5	ZEV Qty	A05	B05	C05	D05
6	ZEV Flex	A06	B06	C06	D06
7	Bldg Elect	A07	B07	C07	D07
8	Flex Grid	A08	B08	C08	D08
9	HC PV	A09	B09	C09	D09
10	HC Storage	A10	B10	C10	D10
11	LC PV	A11	B11	C11	D11
12	LC Storage	A12	B12	C12	D12
13	Retirement	A13	B13	C13	D13
14	Tx-Free OOS W	A14	B14	C14	D14

Keeping in mind the descriptions of each candidate plan on slide 29, the description of each sensitivity on slide 33, the key questions that the Reference Plan is intended to answer shown on slide 12 and the resource investment questions on slide 13, please respond to the following questions:

a. **Assuming that Energy Division models all four candidate plans, are the quantities of out of state wind and storage resources shown on slide 29 for candidate plans B and C, respectively, reasonable? Why or why not? If not, what quantities would you recommend and why?**

b. **Are any proposed combinations of candidate plan and sensitivity redundant, not realistic, or otherwise not useful to run? Please list the specific case labels (e.g., B05, C06) that you think should be omitted and provide an explanation for why it should be omitted.**

c. **What futures (a combination of two or more sensitivities to represent some consistent projection of the future), if any, should be run (for examples of futures, see slide 34)? In your response, please 1) provide a name for the future; 2) list, by reference to the numbers in the table below, which sensitivities should be included in the future; and 3) provide an explanation for why that future is plausible and what questions could be answered by studying it.**

CalWEA Response to Question 1 a, b and c

As indicated in the introduction above, the resources that are addressed in "Candidate Plans" should instead be evaluated as sensitivities, or, as in the case of out-of-state (OOS) wind, resource supply curves should capture additional information such that sensitivities are unnecessary. Thus, the columns at the top of the matrix should be for the Central Future and one or two additional futures to evaluate major uncertainties, such as "X Sectoral" future noted on slide 34 to evaluate large impacts from building and transportation electrification. Whatever resource quantities are settled upon for Bulk Storage and Advanced DR after considering responses to Question 1 can be used in evaluating these resource levels as sensitivities.

In the case of OOS wind, CalWEA believes that this resource can be addressed in a more accurate way that will also simplify the process. In sum: the resource supply curve for OOS wind should be made more complete to better reflect existing OOS wind delivery options utilizing, among other sources, the information from RETI 2.0, which would obviate the need for a separate OOS Wind Candidate Plan and the RETI 2.0 "Future" because all Futures will then be fully and properly informed of all resource options. Indeed, our understanding is that the model currently includes OOS wind only to the extent that it can be directly interconnected to the existing CAISO grid with new transmission when, in fact, there are myriad ways that OOS wind resources can be accessed. If a sensitivity is needed to force-in OOS wind or any other resource, it should be to study the cost implications of taking resources out of merit order to achieve specific policy goals (such as providing benefits for disadvantaged communities pursuant to AB 197).

Building a more robust OOS wind supply curve involves the same type of analysis that would be involved in determining a "reasonable" amount of OOS wind for a Candidate Plan. Either way, we must consider the various ways that OOS wind resources can currently -- or could, with policy changes and/or transmission investments that could reasonably occur -- contribute to meeting California's RPS goals:

1. Resources that are directly interconnected to the existing CAISO grid that extends beyond California's boundaries, which currently qualify as "product content category 1" (PCC 1) resources under the RPS;
2. Resources within the WECC that are not directly interconnected to the existing CAISO grid but can deliver directly to the CAISO through a dynamic transfer

agreement[1] with the CAISO and the project's host transmission provider using firm transmission service, which currently qualify under PCC 1;

3. Resources within the WECC that are not directly interconnected to the existing CAISO grid but can deliver directly to the CAISO through a dynamic transfer agreement with the CAISO and the project's host transmission provider using *conditional* firm transmission service, which would qualify under PCC 1 with an enabling CAISO tariff change;
4. Resources in the previous two categories (relying on dynamic transfer) that could connect to the WECC grid with relatively limited new transmission infrastructure that interconnects OOS wind resource areas with the WECC grid;
5. Resources within the WECC that would be directly interconnected to the CAISO with new transmission lines, which would qualify under PCC 1;
6. Resources that could directly interconnect to an expanded CAISO grid that extends into the WECC region outside of California, possibly with new transmission and possibly with dynamic scheduling to resources outside of the expanded footprint, which would qualify under PCC 1;
7. Resources that could qualify under PCC 2 ("firmed and shaped" products, which can fulfill up to 25% of RPS compliance) or PCC 3 (renewable energy credits, which can fulfill up to 10% of RPS compliance).

Given the tremendous quality and quantity of wind resources outside of California and within the WECC, the OOS wind supply curve could be virtually unlimited under these various options, over which California has some, if not full, control. The issue, for developing the IRP Reference Plan, is defining a sufficient quantity of resources in the supply curve based on the cost of accessing and the lead time for interconnecting these resources. If the supply curve is not fully informed of low-cost, short-lead-time options, then a sensitivity for OOS wind should fully reflect those options. Either way, we would expect to see at least 10,000 MW of wind resources added to the supply curve for the purpose of selecting any one of the IRP's optimal portfolios.

Energy Division has shown that procurement towards the 2030 RPS target is likely to be optimally comprised roughly of half solar and half wind, in part due to the declining capacity value of solar and increasing solar curtailments as solar penetration rises.[2] Given a "net short" of

[1] Such arrangements put the project under direct CAISO control as if it were physically located within the CAISO's balancing area.

[2] See Presentation by Forest Kaser (CPUC) to RETI 2.0 workshop, April 18, 2016.

approximately 24,000 MW of non-rooftop PV renewables between 2015 and 2030,[3] roughly 10,000 MW of wind is likely to be needed to achieve a cost-effective 50% RPS portfolio.

However, most of the best remaining wind resource areas within California are unavailable due to county and federal land-use restrictions or outright wind prohibitions.[4] Thus, CalWEA estimates the long-term potential for new wind development to be, at most, 2,000 MW in all of California.[5] (Note, however, that there are at least 700 MW of existing wind projects in high-quality wind resource areas that do not have long-term RPS contracts and could be repowered; these resources should be included in the model's supply curve as CalWEA has requested before.[6] Their continued operation without long-term contracts should not be assumed.)

The OOS wind supply curve can be conservatively developed for the 2018 IRP and refined for later IRP cycles. OOS wind potential can be divided into three basic categories:

- A **low-cost, near-term tranche** reflecting resources that could be accessed without any major transmission upgrades and with no policy changes;
- A **middle-cost, mid-term tranche** reflecting resources that could be accessed with relatively low-cost transmission upgrades and/or with policy changes that are reasonably possible.
- A **maximum-cost, longer-term tranche** reflecting resources accessed through major transmission upgrades directly interconnecting to the current CAISO grid.

The **low-cost tranche** should reflect the increasing availability of firm transmission service in the WECC that will accompany the scheduled retirement of coal plants. According to the RETI 2.0 Western States Outreach Project Report (WSOP),[7] there are 3,000 MW of coal units coming offline in the West by 2019, and another 4,000 MW by 2025, creating the ability to "repurpose" for renewables a significant amount of transmission capacity previously used for

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[3] Figures drawn from the California PATHWAYS study, available on the E3 website at: https://ethree.com/public_projects/energy_principals_study.php

[4] See "The (Limited) Wind Energy Potential in California," CalWEA presentation at a March 16, 2016 Energy Commission workshop, available at http://www.calwea.org/public-filing/limited-wind-potential-california-31616-reti-20-workshop.

[5] Reflecting this bleak outlook is the fact that only 256 MW of in-state wind projects are currently in the CAISO queue (up to queue cluster 8).

[6] See CalWEA's 3-29-16 Comments in the RPS Proceeding, R.15-02-020, on Staff Paper on Draft 2016 RPS Portfolios for Generation and Transmission Planning, at p. 4.

[7] RETI 2.0 Western States Outreach Project Report (Revised November 2, 2016), p. 20. Available at: http://www.energy.ca.gov/reti/reti2/documents/index.html.

coal. While it is not clear how much of that 7,000-MW of firm-transmission capability would be available for deliveries to California, it would be reasonable to assume that a significant portion – at least one-third (approximately 2,500 MW) -- would be available for use in combination with dynamic scheduling[8] in the years leading up to 2024.

This amount of near-term, low-cost capacity could also – conservatively – be doubled to reflect the OOS wind resources that could interconnect to an expanded CAISO footprint without transmission additions, or, in the alternative, to reflect a possible CAISO and WECC rule change that could enable conditional-firm service to be used in conjunction with dynamic scheduling.

To elaborate on conditional firm service: currently, the CAISO and WECC require firm transmission service in order to use dynamic scheduling. However, there is no reason why a CAISO and WECC protocol amendment could not enable dynamic scheduling using conditional-firm service, which would allow the direct delivery of far more OOS wind resources with very limited curtailment. The RETI 2.0 WSOP Report noted that financiers of renewable generation projects have historically been disinclined to have a facility's output curtailed in instances when transmission service would not be available under conditional firm service.[9] However, as we noted in comments for the RETI 2.0 process, overcoming this barrier is likely to be mainly an educational and contractual challenge (as compared to getting land-use permits and raising capital for new transmission lines), since the risk of curtailment under conditional firm service can be strictly limited and bounded in both amount and timing -- critical factors in project finance because it allows potential losses to be quantified. It is reasonable to expect very limited curtailment, if any, for a very significant amount (i.e., at least 5,000 MW) of renewable energy additions across the WECC footprint, given WECC studies showing that little or no physical congestion would occur with such additions without any transmission upgrades in view of

[8] In the past 14 months, four contracts totaling over 700 MW of OOS wind energy have been signed with two California utilities that will utilize dynamic scheduling and out-of-state transmission service using existing transmission lines. See October 27, 2015, SCE Advice Letter 3299-E (Broadview Energy Contracts for 324 MW), and February 9, 2016, SCE Advice Letter 3360-E (El Cabo Contract for 298 MW). In addition, SMUD has signed a contract for 200 MW from the Broadview project.

[9] *Supra* note 7 (WSOP) at p. 9.

scheduled coal-plant retirements.[10] Conditional firm service could enable far more, given that WECC transmission lines, even if reserved, are unused much of the time.[11]

The **middle-cost, mid-term tranche** should reflect resources that could be accessed with relatively low-cost transmission upgrades and/or with policy changes that are reasonably possible – i.e., again, CAISO expansion and/or the use of conditional firm service with dynamic scheduling to access wind outside of the current or expanded CAISO footprint. While RETI 2.0 was not a regulatory process and its findings, if incorporated into the IRP process, should be subjected to public review, the draft RETI 2.0 report includes a potentially valuable "schedule" of potential transmission upgrades and the associated cost range per new capacity that would be accessed by each of those potential upgrades.[12] This information could be used to provide transmission upgrade costs for the relatively low-cost lines that could interconnect OOS wind resource areas with the WECC grid conservatively in the mid-2020s for use in conjunction with dynamic scheduling and firm or conditional transmission service. Such lines, with costs well under $1 million per MW, could connect several thousand megawatts of wind energy capacity, according to the draft RETI 2.0 report.

A **maximum-cost, longer-term tranche** could reflect the higher-cost lines that would interconnect directly to the CAISO grid listed in the RETI 2.0 report and conservatively assume that they would not be operational until the late-2020s.

Developing such a supply curve, given the lack of a rigorous study at this point in time, would require some judgment for the purpose of the initial IRP cycle. Given, however, the myriad means of transmitting OOS wind into California, undergirded by the significant potential for PCC 2 and 3 products, even a very a conservative approach for the initial IRP should yield abundant OOS wind resources in the supply curve that will enable the IRP process to generally indicate how much OOS wind would be needed to minimize costs in achieving the state's RPS and greenhouse gas goals so that the state can conduct the planning that may be necessary to

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[10] See WECC Reliability Study Requests, "PC-21: Coal Retirement," Slide 11, Presentation of Brian Woertz (October 2015). Available at: http://westernenergyboard.org/wp-content/uploads/2015/10/10-29-15_CREPC-SPSC-WIRAB_woertz_WECC_reliability_study_requests.pdf. See also CalWEA's April 28, 2016 Comments following the April 18, 2016, Renewable Energy Transmission Initiative 2.0 Plenary Group Meeting.

[11] See the 2013 WECC Path Rating Catalog (later editions are not publicly available).

[12] See draft RETI 2.0 Plenary Report, Table 2-3, p. 38. Available at: http://www.energy.ca.gov/reti/reti2/documents/index.html.

achieve those goals. A more rigorous study can and should be conducted prior to the next IRP cycle to inform the supply curve more precisely.

Question 2

During the workshop there was discussion about the scope of costs and benefits to compare when assessing which portfolio is optimal. Two approaches surfaced.

- **Include costs incurred by utilities, LSEs and ratepayers. For example, include customer costs associated with energy efficiency measures, behind-the-meter PV, and transportation electrification.**

- **Limit costs to those borne by utilities and LSEs. For example, include administrative and incentive costs associated with energy efficiency, but not customer costs.**

Which approach is most reasonable for developing the 2017 IRP Reference Plan and why?

CalWEA Response to Question 2

Including customer costs would be in keeping with the notion of producing an IRP that reduces overall costs. The state has an interest in promoting energy investments that are efficient from an overall perspective so that private as well as public resources are spent efficiently.

Question 3

As part of the email sent to the service list on December 15, staff provided responses to questions from parties following the IRP Modeling Advisory Group Webinar held on November 17 (http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442451900). Are there any further questions related to these responses?

CalWEA Response to Question 3

In response to question 2 in the document linked to this question, staff explains that RESOLVE "utilizes an explicit assumption to limit exports from the CAISO footprint." While we understand that modeling export limits is necessary for "non-regional" IRP studies, CalWEA is at a loss as to why treatment of the export limits should be so arbitrary and unscientific. As we all understand, there are NO regulatory or technical reasons to limit energy exports (instantaneous or net over a period of time) from California to neighboring Balancing Areas (BAs). Hence, these limits could and should be reasonably established. For that purpose,

CalWEA suggests that a WECC-wide study with proper hurdle rates for inter-BA transactions be performed to determine maximum expected export values from California to neighboring BAs. One such value should be established for each study year and interpolation could be used to determine the maximum expected export value for non-study years. The maximum expected export values, thus determined, would then become export limits for the IRP studies.

Respectfully submitted,

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