

**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)

**COMMENTS OF THE CALIFORNIA WIND ENERGY ASSOCIATION
ON PROPOSED REFERENCE SYSTEM PLAN
AND RELATED COMMISSION POLICY ACTIONS**

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

October 26, 2017

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Pursuant to the September 19, 2017, *Ruling Seeking Comment on the Proposed Reference System Plan and Related Commission Policy Actions* (“Ruling”) by Administrative Law Judge Julie Fitch, the California Wind Energy Association (“CalWEA”) submits these responses to the questions posed in the Ruling. In addition, CalWEA introduces into the record results from RESOLVE modeling runs that CalWEA has conducted to supplement those conducted by Energy Division staff (“Staff”), which support the CalWEA recommendations set forth herein.

I. SUMMARY OF RECOMMENDATIONS

A. The Commission Should Immediately Order Early Procurement of Wind Resources to Capture Ratepayer Benefits that Will Otherwise be Lost Due to the Expiration of Federal Wind Tax Credits

CalWEA urges the Commission, in its decision on the Reference System Plan (“RSP”), to order the investor-owned utilities (“IOUs”) to immediately conduct a competitive solicitation for up to 5,000 MW of in- and out-of-state wind resources in order to capture federal tax benefits before they imminently expire, with a special focus on repowering existing wind energy facilities, provided that solicitation results confirm the cost-effectiveness of these resources.

As documented in these comments, which build upon Staff’s RESOLVE modeling runs, additional RESOLVE modeling runs conducted by CalWEA¹ show that this action will save ratepayers at least \$74 million/year, including \$35 million/year in benefits from 1,142 MW of

¹ Support was provided by Ana Mileva.

additional wind resources that Staff has already shown to be cost-effective.² In addition to securing ratepayer savings, procuring wind with full tax benefits will preserve the resource diversity we have now from existing in-state wind facilities and enhance that diversity with additional in-state and out-of-state wind energy projects. Absent this action, Staff's IRP modeling work suggests that California's energy portfolio will become so heavily dominated by solar PV resources that economic and system vulnerabilities could ensue. Further, if action is not taken now, as much as 1,100 MW of California's original 1980s-vintage wind energy fleet could be lost.

To capture these tax credits and associated ratepayer benefits, the Commission must issue a decision on early wind procurement as soon as possible in 2018, and approve final power purchase agreements ("PPAs") for these wind projects no later than the end of 2018.

B. The Commission Should Adopt the 42 MMT Scenario as the Basis for LSE Portfolio Planning for Their Individual Plans

The Commission should adopt Staff's proposal to use the Reference System Plan based on a statewide GHG Planning Target of 42 MMT for the electric sector, serving as the basis of individual LSE plans, because achieving GHG reductions in the electric sector is relatively straightforward compared to other sectors, which may face even greater challenges and uncertainties in meeting GHG targets. The 42 MMT target has also been shown to bring the most significant air pollution benefits to disadvantaged communities. Finally, we note that, if the Commission rationalizes the IRP assumption with regard to behind-the-meter ("BTM") PV, the associated savings from reducing BTM PV at current net metering rates can alone more than pay for the increased cost of achieving the 42 MMT target.³

C. The Reference System Plan Should Be Revised by Removing Pre-RPS Existing Wind Resources from the Baseline and By Reflecting Available Lower-Cost Means of Importing Out-of-State Wind Energy

It is not appropriate to assume, as the RESOLVE model does, that all pre-RPS existing wind projects will continue to operate until 2030. Over 1,000 MW of these projects would be 40

² For more detail, see especially CalWEA's responses to Questions 1, 5 and 8.

³ The net benefits from moving from the Default to the 42 MMT case, including the low-BTM sensitivity were shown to be \$444 million. Ruling Attachment A at PDF-page 202.

years old in 2030, and, given the cost to keep these projects operating, the assumption of continued operation is tenuous. Placing these resources instead in the supply curve as potential repower projects demonstrates the value of such repowering, supported by federal tax credits.

The RESOLVE model also should be informed by the ability to import New Mexico wind resources using relatively low-cost transmission upgrades delivering wind into Arizona and wheeling energy from there into California with existing firm transmission capacity. Such New Mexico wind projects and their associated transmission upgrades are already in an advanced stage of development and, supported by federal tax credits, RESOLVE shows that these projects would deliver ratepayer savings.

II. CalWEA RESPONSES TO THE RULING’S QUESTIONS FOR PARTIES

Question 1: Please comment on the appropriateness of the baseline resources included in the RESOLVE model. What changes would you make and why?

CalWEA Responses:

(a) Pre-RPS existing wind resources should be removed from the baseline and added to the supply curve.

It is not appropriate to assume, as the RESOLVE model does, that all pre-RPS existing wind projects will continue to operate until 2030. While some of these projects have already been repowered with modern technologies and are under new, long-term contracts, as much as 1,130 MW are still comprised of 1980s-vintage technologies that would be over 40 years old by 2030, as estimated and documented in **CalWEA Attachment 1**. Most of these projects are either in the last few years of their 1980s-era “QF” contracts,⁴ are operating under short-term contracts, or are selling directly into the CAISO market.⁵ These contracts or prices are insufficient to support the repowering of – or even capital repairs for – these aging facilities. As

⁴ Virtually all wind energy projects that were operating in California prior to the adoption of the RPS in 2002 were “qualifying facilities” (“QFs”) operating under “standard offer” contracts pursuant to California’s implementation of the federal Public Utility Regulatory Policies Act (PURPA) of 1978. Most of these contracts were 30 years in length. Approximately 1,700 MW of QF wind contracts will have expired between 2014 and 2020, as detailed in **CalWEA Attachment 1**.

⁵ Average prices in the CAISO market in SP-15 averaged 2.8 cents/kWh between mid-2016 and mid-2017. Scheduling and other fees are subtracted from these prices.

a result, these projects are already at risk of deterioration and shutdown. Indeed, California's total installed wind energy generation has actually declined by over 250 MW since 2015.⁶ Without immediate action, CalWEA expects this decline to continue. The RESOLVE model, therefore, should not assume that these projects will continue to operate until 2030 by placing them in the baseline. CalWEA has repeatedly made this recommendation in the IRP and predecessor processes.⁷

New, long-term power purchase agreements will be required to support the capital investment that is needed to repower these aging projects so that they can continue to operate at full capacity, with new technology substantially boosting energy production over historical levels. CalWEA conducted a modeling run using RESOLVE to test the cost-effectiveness of wind repowers in the RSP by placing 1,130 MW of wind repowers in the supply curve, allowing them to compete with other resources in meeting California's GHG goals. RESOLVE selected 1,115 MW of these repower resources as part of the optimum resource portfolio in the 42 MMT Reference Case. RESOLVE also calculated the resulting ratepayer benefits from repowering these aging projects to be \$36 million/year, with repower costs assumed to be at the same level as were assumed for greenfield projects in the same CREZs.

CalWEA's RESOLVE study consisted of simply removing 1,130 MW of 1980s-vintage wind projects from the baseline and placing that capacity as new resources in the supply curve in the CREZ where they are located.⁸ We found that – with the support of the Production Tax Credit ("PTC") -- 1,115 MW (nearly all of the 1,130 MW) were selected by the model in the 42 MMT Reference Case. These modeling results are shown in **CalWEA Attachment 2**.⁹ CalWEA recommends that this far more realistic assumption – that 30-year old wind projects

⁶ U.S. DOE Wind Technologies Market Report, 2015 and 2016. The 2015 report shows 5,917 MW of wind energy installed in California, while the 2016 report shows 5,656 MW, a difference of -261 MW.

⁷ See, e.g., CalWEA's March 29, 2016, 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; and, in this proceeding, CalWEA's January 13, 2017 Informal Comments Following the December 16, 2016, Workshop on the Reference Plan for the IRP-LTPP Proceeding, at p. 5.

⁸ See **CalWEA Attachment 1** for a list of projects in each wind resource area that were removed from the baseline and placed into the supply curve. This list is also posted at www.calwea.org/public-filings.

⁹ As indicated in the **Attachment 2** results summary, CalWEA's complete modeling results are posted at www.calwea.org/public-filings.

will not continue to operate without new contracts and repowering – be embedded in all the IRP Reference Cases.

(b) BTM PV

The baseline should not assume levels of BTM PV that the IRP results clearly show to be grossly non-cost-effective. As noted in the Ruling (at p. 6), the model assumes 16 gigawatts (GW) of BTM PV by 2030 based on the CEC’s 2016 IEPR Mid case, which assumes indefinite continuation of the current Net Energy Metering (“NEM”) tariff. However, the Commission is scheduled to begin revisiting this tariff next year, and the RESOLVE results show that reducing BTM PV to 9 GW would save ratepayers \$682 million/year in the 42 MMT case.¹⁰

While location-specific transmission and distribution (“T&D”) deferral benefits (net of specialized distribution upgrades needed to accommodate high BTM penetrations) are not considered in RESOLVE, the RESOLVE model also does not consider the ratepayer impact of NEM, since the assumed cost of BTM PV was the estimated installation cost only, as confirmed in response to a question posed on this point by CalWEA in the IRP “office hours” held by Energy Division.¹¹ This cost is likely to be far higher than any T&D net benefits associated with BTM PV. CalWEA estimates that adding the ratepayer impact of NEM would approximately double the cost impact of 7 GW of additional of BTM PV in the Reference case compared to the low-BTM PV case, to \$856 million in the 42 MMT case.¹² Therefore, the Commission should include no more than 9 GW of incremental BTM PV by 2030 in the Reference case until the Commission determines the successor NEM tariff in view of any location-specific values determined in the Distributed Resources Plan proceeding.

¹⁰ Ruling, Attachment A, PDF-page 202.

¹¹ Modeling Advisory Group, Office Hours 1 – 10/3/2017, Webinar Recording. Available at: <http://www.cpuc.ca.gov/General.aspx?id=6442453968>.

¹² Note that, even if the Total Resource Cost (TRC) test were changed to exclude “private” costs (a large portion of which are actually publicly funded tax credits), BTM PV would still come at a high cost to ratepayers. According to the NEM Public Tool (available at: www.cpuc.ca.gov/General.aspx?id=11285), the maximum value of BTM PV resources is \$0.12/kWh, while NEM rates are \$0.25/kWh, producing an effective ratepayer subsidy to BTM PV of \$0.13/kWh. This added ratepayer cost, which was not accounted for in the IRP studies, produces an incremental cost similar to the \$444 million/year savings shown in the 42 MMT sensitivity case, going from 9 GW to 16 GW of BTM PV.

Question 2: Comment on the appropriateness of the three major scenarios modeled by staff (Default Scenario, 42 MMT Scenario, 30 MMT Scenario).

CalWEA Response:

CalWEA considers these three scenarios to be a reasonable range of cases, and that the 42 MMT Scenario should serve as the Reference scenario as recommended by Energy Division.

Question 3: Provide any comments or reactions to the cost metrics analyzed and the estimated cost results.

CalWEA Response:

CalWEA offers no general comment at this time, however we have made some specific comments regarding estimated cost results in answer to other questions.

Question 4: Comment on the viability of renewable curtailment as a grid integration strategy.

CalWEA Response:

Curtailment of renewable resources has been demonstrated by this IRP analysis to be a very cost-effective tool for achieving the state's GHG reduction goals at least cost, as compared to capturing all excess energy in storage or implementing RPS resources that are fully dispatchable. The implementation of curtailment has also been shown in current utility and CAISO practice to be a viable means of preventing system overload and resulting reliability conditions. However, CalWEA has previously expressed concern that the cost of curtailment may not be properly and fully allocated to buyers and sellers during the procurement process.

Specifically, the RESOLVE model assumes, in developing the Reference System Plan, that the cost to curtail excess renewable generation will be factored into the procurement process. The problem is that curtailment costs are not necessarily being fully included – if included at all – in LSEs' procurement analyses of proposed bids. Thus, LSE procurement is unlikely to match the procurement assumed in the IRP analyses.

As CalWEA has explained in previous comments in this proceeding,¹³ in order for curtailment costs to be fully reflected in procurement costs, it is essential that the PPAs entered

¹³ For a discussion of these issues, see CalWEA's June 28, 2017, comments in this proceeding on Staff Proposal on Process for Integrated Resource Planning.

into by all LSEs provide that the LSE-buyer will pay for all of the seller's renewable energy curtailment, both economic¹⁴ and reliability overgeneration-related curtailments.¹⁵ This uniform requirement is necessary both to ensure that curtailment costs are fully accounted for in planning and procurement, and to facilitate generator financing, particularly as curtailment costs mount. Further, the IOUs (if not all LSEs) should be required to use their economic curtailment rights to avoid negative pricing conditions signaling potential overgeneration conditions.

If curtailment costs are not evenly incurred by all Commission-jurisdictional LSEs, the costs of curtailment should be fairly re-apportioned among those LSEs.

Question 5: Comment on the advisability of early procurement of renewables to take advantage of federal ITC and PTC availability.

CalWEA Response:

The fundamental objective of IRP is to determine the most cost-effective strategy to reliably meet the state's GHG-reduction goals over the long-term. The IRP analysis conducted by Staff, supplemented by additional RESOLVE modeling runs conducted by CalWEA as documented in these comments, demonstrate that it is advisable for the Commission to immediately require each of the IOUs to immediately conduct a wind-only procurement totaling up to 5,000 MW, with special focus on wind repowers. This action is advisable for many reasons:

- it will produce estimated ratepayer savings of \$74 million/year or more;
- it will ensure a modest level of resource diversity in the portfolio;
- procurement can be conditioned upon the solicitation results confirming the expected cost-effectiveness of wind resources; and
- this opportunity will otherwise be lost, as the federal wind PTC is expiring imminently.

Thus, the Commission's immediate action is warranted. A wind-only procurement is consistent with the IRP process, whether or not the Commission also instructs the IOUs to procure other resources pursuant to IRP results. These issues are discussed further below.

¹⁴ Economic curtailment is when LSEs instruct generators to curtail production when CAISO market prices go negative, signaling system overgeneration conditions.

¹⁵ The CAISO orders curtailment on an emergency basis for the purpose of maintaining system reliability when supply is expected to unavoidably exceed demand.

(a) The Commission should require each of the IOUs to immediately conduct a wind-only procurement to capture expiring PTCs, associated ratepayer savings, and diversity benefits.

The Commission should require the IOUs to immediately conduct a solicitation to procure up to 5,000 MW of wind projects prior to the expiration of the federal PTC, because doing so is expected to produce at least \$74 million/year in ratepayer savings compared to foregoing this opportunity (assuming a 42 MMT GHG target),¹⁶ while preserving and enhancing California's existing resource diversity. As discussed below, limiting a procurement opportunity to wind resources is consistent with the IRP process, whether or not the Commission also instructs the IOUs to procure other resources pursuant to IRP results.

As CalWEA has documented elsewhere in these comments, IRP RESOLVE modeling shows that these savings would result from immediately procuring approximately 2,000 MW of wind energy from in-state projects (about half from repowering existing wind projects), and 3,000 MW of wind energy from out-of-state projects needing modest transmission upgrades that do not require CAISO approval or ratepayer funding (although the actual mix of wind resulting from a competitive wind solicitation may vary).

As Staff's IRP analyses demonstrate, augmented by CalWEA's modeling runs, immediate wind procurement is also essential to preserve even a modest level of portfolio diversity in California's renewable energy portfolio. Otherwise, the 42 MMT incremental portfolio will not only be completely dominated by solar energy,¹⁷ but a major portion of the wind energy that is operating today will be at significant risk of permanent shutdown.

This dependence on a single renewable resource and technology could create both economic and system vulnerabilities. Economic vulnerability could exist from numerous

¹⁶ This \$74 million/year figure is comprised of \$35 million/year from the 1,142 MW of in-state wind resources that staff identified in the 42 MMT Reference case, at least \$3 million/year from 3,000 MW of out-of-state New Mexico resources as documented in CalWEA's response to Question 8, below, and \$36 million/year from in-state repowers, as documented in CalWEA's response to Question 1, above.

¹⁷ Staff's modeling results generally show an incremental 9 GW of utility-scale solar, 16 GW of BTM solar, and just 1,000 MW of incremental wind being selected by 2030, assuming Commission action to capture tax credits, and do not contemplate the decline in existing resources. If these figures translate into actual procurement, accounting for existing solar resources and a likely 1,000-MW decline in existing wind resources, the RPS resource portfolio in 2030 would consist of roughly 40,000 MW of solar (including BTM PV), just 5,500 MW of wind resources and likely diminishing amounts of geothermal, biomass and small hydro resources.

possible market factors, such as the tariff dispute noted below, land-use policy changes, or changes in raw material costs. System vulnerabilities will come about as solar PV capacity becomes more than half the state’s generation capacity when the daily peak net load is shifting more and more towards late evening hours.

While the RESOLVE modeling results show that diversifying the portfolio with baseload resources would come at a very significant cost (and, moreover, there is no tax-related procurement urgency¹⁸), a Commission decision to maintain and enhance portfolio diversity provided by wind resources in the portfolio will come with substantial savings to ratepayers.

(b) The ratepayer savings identified by CalWEA associated with a 5,000 MW wind procurement are likely to be underestimated, for several reasons

Many important assumptions made in Staff’s IRP analysis understate the likely need for additional utility-scale renewables by 2030, and wind specifically, particularly in the 42 MMT case:

- Energy efficiency and BTM solar PV have been modeled as fixed-amount inputs to the model, rather than with granular supply curves that may later demonstrate that the assumed levels are not cost-effective, and thus unlikely to be realized.¹⁹
- Particularly in the case of BTM PV, as discussed in response to Question 1, above, the Proposed RSP assumes a high level of BTM PV despite IRP results that clearly show that level to be grossly non-cost-effective. In a low-BTM PV scenario, the value of importing 3,000 MW of New Mexico wind would rise from \$3 million per year in the 42 MMT Reference Case to \$15 million per year, as demonstrated in a RESOLVE modeling run conducted by CalWEA, documented in **CalWEA Attachment 2**.

¹⁸ The ITC for geothermal electric will remain at 10% indefinitely. See U.S. Department of Energy, “Business Energy Investment Tax Credit (ITC)” Available at: <https://energy.gov/savings/business-energy-investment-tax-credit-itc>. Only “closed-loop” biomass is eligible for the PTC, which is generally not applicable to California biomass facilities.

¹⁹ We note that, contrary to the statement in the Ruling (at p. 4) that a doubling of energy efficiency is not “required” by SB 350, that statute (PRC Section 25310 (c)(1)) conditions the goal of doubled energy efficiency on cost and other factors: “On or before November 1, 2017, the commission ... shall establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030. The commission shall base the targets on a doubling of the midcase estimate of additional achievable energy efficiency savings, ... to the extent doing so is cost effective, feasible, and will not adversely impact public health and safety. (Emphasis added.)

- As discussed in response to Question 8, below, it is quite reasonable to attach some significant probability to net export levels remaining at zero. If that status quo continues, a RESOLVE modeling run conducted by CalWEA shows that the value of 3,000 MW of New Mexico wind increases from \$3 million per year in the 42 MMT Reference Case to \$38 million per year, as documented in **CalWEA Attachment 2**.
- Solar PV generally could become far more expensive than assumed if the Trump Administration imposes tariffs on imports of solar products following a ruling by the U.S. International Trade Commission.²⁰
- The assumed liberal use of RPS bank by 2030 will create a major shortfall (on the order of 4% of the RPS requirement) in RPS resources soon after 2030.²¹ This unrealistic assumption would create a significant and sudden need for additional RPS resources soon after 2030. In order to avoid this major shortfall, LSEs would more likely spread the RPS bank to more gradually draw down to zero past 2030 in order to create a smoother transition. This would create a greater RPS resource need prior to 2030.

All of these factors further support and justify an immediate procurement of up to 5,000 MW of wind energy, which may well prove to be a very conservative figure in terms of the amount of wind capacity that can be cost-effectively procured now, with PTC benefits.

(c) The Commission should direct the IOUs to conduct wind-only procurements in early 2018 and approve contracts no later than year-end 2018

The Commission should direct each of the IOUs to hold a wind-only competitive solicitation in which wind energy is procured to the extent that the solicitation results prove consistent with Staff's IRP analysis, as amended by CalWEA's additional modeling runs. That is, up to 5,000 MW of wind should be procured from projects with viable 2020 in-service delivery dates at bid prices that match or beat the marginal price that IRP modeling has demonstrated to be cost effective in the overall 2030 portfolio. Solar, or any other resource procurements that are justified by IRP analyses could likewise occur separately, either concurrently or at a later time.

²⁰ See, e.g., Forbes, "How First Solar and SunPower Could Be Impacted by the U.S. ITC Ruling" (Sept. 25, 2017). ("Penalties on imported panels could drive up their landed cost in the U.S. market, making many solar projects unviable, as the panel cost typically accounts for close to 40% of the project cost.")

²¹ See Ruling Attachment A, slide 58 (PDF-page 59).

Resource-specific procurements are appropriate because IRP analyses have already demonstrated that certain quantities of resources within the overall portfolio are cost-effective up to a certain marginal price. Essentially, IRP represents a more comprehensive and holistic version of the least-cost, best-fit (“LCBF”) analyses than would otherwise be conducted by each IOU. Indeed, the whole point of IRP is to identify the optimal resource mix; thus, particularly in light of the imminent loss of federal wind tax credits, the Commission must act immediately to secure the wind component of that optimal mix.

Moreover, it would be inappropriate to hold a solicitation open to all renewable resources using LCBF processes that have not yet been updated to reflect total-cost indicators implicit in the IRP analysis. The Ruling indicates that the Commission will not develop a “common resource valuation methodology” (in other words, a complete RPS LCBF methodology reflecting IRP-derived values) for use in bid evaluations in time to support an early-2018 procurement.²² However, the IOUs should be authorized to use the LCBF and RPS project-viability assessment process to rank competing wind energy project bids within the wind-only solicitation (e.g., to evaluate output profiles and other factors that affect the value of specific wind projects).

Therefore, the Commission should direct the IOUs to conduct a procurement for their pro-rata share (based on distribution load) of up to 5,000 MW of wind that the IRP process – as amended by CalWEA’s documented modeling runs – has shown to be cost-effective in saving significant ratepayer dollars as a result of captured federal tax benefits. The IOUs should select their full pro-rata share of wind bids, as long as the bid prices are equal to or less than the cost of the marginal wind resource selected in the IRP process and can be delivered within the timeframe indicated in the applicable bids. Procurement by the IOUs should be undertaken on behalf of all LSEs with the costs and benefits fully allocated on a nondiscriminatory basis to prevent cost shifting pursuant to the Commission’s forthcoming decision on the Power Charge Indifference Adjustment (R.17-06-026).

While CalWEA has shown that 5,000 MW of wind saves significant ratepayer dollars as part of the Reference portfolio, the Renewable Energy Transmission Initiative (“RETI”) 2.0 process has documented Western transmission projects that are in an advanced stage of

²² Ruling at p. 33-34.

development that could deliver 10,000 MW of wind²³ and can therefore be expected to participate in the wind-only solicitation, along with the 1,145 MW of potential California greenfield projects identified by Staff, 1,130 MW of existing wind projects that CalWEA has identified as candidates for repowering, and potentially wind projects out of the Northwest. Thus, some 12,000 MW of wind project capacity can be expected to participate in the proposed wind-only solicitation.

This directive should be included in the Commission's decision on the RSP and the wind-only solicitations should take place immediately thereafter, with an expedited schedule for Commission approval of executed PPAs such that contracts are approved no later than the end of 2018 to enable PTC pricing to be locked-in, with deliveries scheduled to commence at a later date.

It is imperative that the Commission ensure immediate action to capture the wind energy tax benefits. While 2016 was the last year to qualify for 100% of the wind PTC, safe harbor provisions make it possible to capture 100% of the PTC if projects are placed in service by December 31, 2020. However, to allow sufficient time for financing and construction, this will require PPAs to be signed and approved in 2018.

(d) Procuring wind is more urgent than procuring solar or other resources

CalWEA has no objection to the Commission also directing the procurement of solar PV in time to capture the solar-ITC tax benefits identified in the RSP, or any other resources that can be justified by IRP analysis. However, wind procurement is far more urgent, as the schedule for the ITC phase-out lags the PTC phase-out by three years, as shown in the table below.²⁴

²³ RETI 2.0 Final Plenary Report, at Table 2.4 and p. 61. Available at <http://www.energy.ca.gov/reti/>. Projects identified as being in an advanced stage were those that have received a federal final environmental impacts statement or record of decision and entered Phase 2 or greater of the WECC Path Rating Process. The RETI 2.0 process identified Gateway South and West, Southline, SunZia, SWIP North, and TransWest Express (facilitating approximately 10,000 MW of wind energy capacity) as being in an advanced stage of development.

²⁴ See "[Fading into the sunset](#): Solar and wind energy get five more years of tax credits with a phase-down," [Trends](#), American Bar Association (May/June 2016).

Production and Investment Tax Credit Phase-Out Schedules

Date	through 2016	Jan. 1, 2017	Jan. 1, 2018	Jan. 1, 2019	Jan. 1, 2020		
§ 45 Wind PTC Value	\$23 / MWh	\$18.4 / MWh	\$13.8 / MWh	\$9.2 / MWh	0		
Date	through 2019				Jan. 1, 2020	Jan. 1, 2021	Jan. 1, 2022
§ 48 Solar ITC Rate	30%				26%	22%	10%

(e) If the Commission authorizes only limited wind energy procurement, it should place the focus on repowering existing wind resources

If, for whatever reason, the Commission decides to direct the IOUs to conduct more limited procurement to capture expiring wind tax credits, it should limit that procurement to the most at-risk existing wind resources currently serving California. The most at-risk existing wind projects are those that were initially built in the 1980s, and that have not been repowered since 1998.²⁵

At a minimum, the Commission should require the IOUs to provide specific plans for procuring renewable energy from repowered wind projects. In Decision 03-06-071, the Commission explained that “repowering of existing wind facilities in prime locations is a common-sense approach to increasing procurement of renewable energy.”²⁶ The Commission affirmed its view in Decision 05-10-014, noting that “repowering existing wind facilities is an important resource for the RPS program.”²⁷ In an effort to capture these benefits, the Commission directed the IOUs to address repowering of existing wind projects in RPS planning,²⁸ and, with respect to PG&E, expressed that the Commission “expect[s] that PG&E

²⁵ Some limited repowering occurred in 1998, before the changes to the federal PTC made it uneconomic to repower during the initial PURPA contract period. Even these repowers are now 20 years old.

²⁶ D. 03-06-071 at 58.

²⁷ D. 05-10-014 at 18.

²⁸ *Id.* at Conclusion of Law 4.

will accord repowering a high priority.”²⁹ This directive was subsequently expanded upon in an Assigned Commissioner Ruling that directed the IOUs to provide “specific plans for procuring electricity from repowered wind projects.”³⁰

Given the benefits offered by repowered wind projects and the very narrow window currently available to capture these benefits, the Commission should, at a minimum, renew the requirement for the IOUs to provide specific plans for procuring renewable energy from repowered wind projects. Benefits offered by repowered wind projects include the following:

- **Continued and more efficient use of existing development sites.** Repowers have low land-use impacts compared to greenfield projects because they make better use of existing project sites – substantially increasing energy production from the same already-disturbed area – and use existing roads, substations, and transmission lines.³¹
- **Generation of property and sales tax revenue, and job creation.** Currently, 1980s-vintage projects have lower assessed value and therefore pay less in property taxes. If the remaining 1,000 MW of un-repowered capacity were repowered with new turbine technology, it would produce approximately the following investment and tax benefits for California and the counties hosting wind repower projects: \$1.6 billion in total investment, generating \$18 million in annual property taxes and \$96 million in sales taxes. In addition, repowering would bring significant, but unquantified, lease payments to ranchers and other land owners. CalWEA estimates that repowering all existing facilities with new turbine technology would produce approximately 1,225 short-term construction jobs, and 270 long-term operations-related jobs.

Question 6: Comment on the impact of banked RPS procurement on this analysis.

CalWEA Response:

CalWEA agrees that banked RPS should be explicitly accounted for in the IRP studies in the determination of the optimum RPS resource portfolio. Our concern, however, as noted in answer to Question 5, above, is that the current IRP study assumes liberal use of RPS bank by 2030, which will create a major shortfall (on the order of 4% of the RPS requirement) in RPS

²⁹ *Id.* at 17.

³⁰ *Assigned Commissioner and Administrative Law Judge’s Ruling Requiring Submission of RPS Procurement Plans, Draft Request for Offers, and Transmission Ranking Cost Reports for 2006*, R. 04-04-026, (April 22, 2004).

³¹ Repowering 1980s-vintage projects would significantly raise project capacity factors. The RESOLVE model shows existing wind resources having a capacity factor of 28%, with new wind projects in the Tehachapi, Riverside and Solano areas having capacity factors of 34%, 33%, and 30%, respectively. However, in many cases, the difference between old and new capacity factors may be far greater.

resources right after 2030.³² This unrealistic assumption would create a significant and sudden need for additional resources soon after 2030. In order to avoid this major shortfall, LSEs would more likely spread more of the RPS bank past 2030 (or reduce use of the bank) to create a smoother transition, creating a greater resource need prior to 2030. This more gradual spread of RPS bank should be assumed in the IRP study as well.

Question 7: Comment on the impact of import/export constraints on this analysis.

CalWEA Response:

The assumptions used in Staff's 42 MMT Reference case arbitrarily assume a net export level of 5,000 MW out of the CAISO footprint, which is nearly 5,000 MW over the highest amount that has ever occurred. The "low export" sensitivity assumes 2,000 MW of exports. However, the current figure is near-zero even though there are no institutional, regulatory, or technical barriers to exporting energy out of the CAISO. If there are limits, they are economic limits resulting from neighboring Balancing Authority's valuation of energy from the CAISO footprint (due to cost of the energy, the wheeling-out cost, or the neighboring area's own minimum generation limits or other operating considerations).

For future studies, a more appropriate limit should be established using WECC-wide production simulation studies.³³ Meanwhile, the Commission should use CAISO's recommended level of 2,000 MW for the base case, and should use zero exports for the "low-export" sensitivity. As CalWEA has shown in its own runs of the RESOLVE model,³⁴ a lower and more realistic export level will show that wind resources further reduce ratepayer costs.

Question 8: Comment on the results of the three long-lead-time resource studies summarized in this analysis: a. Pumped storage; b. Geothermal; c. Out-of-state wind.

³² See Ruling Attachment A, slide 58 (PDF-page 59).

³³ As stated in CalWEA's January 13, 2017, informal comments in this proceeding, these limits could be reasonably established by performing a WECC-wide study with proper hurdle rates for inter-BA transactions 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.

³⁴ See CalWEA response to Question 5, part (b).

CalWEA Response (with regard to out-of-state wind only):

The out-of-state (“OOS”) wind case substantially overstates the cost of accessing OOS wind resources. When more realistic, and still conservatively high, resource-plus-delivery costs are considered, with PTC benefits captured, as CalWEA has demonstrated in a RESOLVE model run, significant incremental ratepayer benefits are shown to accrue.

Neither the OOS wind case, nor any other cases analyzed by Staff, captured the least-cost means of delivering wind energy to California, as CalWEA had previously recommended,³⁵ with benefit of the PTC. Specifically, no cases were run that reflect the potential to connect high-quality New Mexico wind resources to the WECC grid in Arizona with relatively limited, lower-cost WECC transmission upgrades and utilizing existing transmission capacity to deliver energy from Arizona into California. This delivery potential was examined in the RETI 2.0 process, which identified several such delivery options, including the Southline and SunZia transmission projects, which were characterized as being in the advanced-development stage.³⁶ CalWEA believes that both options are capable of qualifying for full PTC benefits. These projects are sized to deliver energy from wind projects totaling 1,000 MW and 3,000 MW of capacity, respectively, with costs paid for by the wind developers.³⁷

Instead, Staff considered the following OOS wind cases:

- (1) 3,000 MW of Wyoming and New Mexico wind (50% from each state) delivered directly to CAISO in 2018 (with PTC benefit) with two new 500-kV lines added from each state into California, which resulted in a net cost of \$4 million/year in the 42 MMT case;³⁸
- (2) 3,000 MW of Wyoming and New Mexico wind (50% from each state) added in 2026 (without PTC support) that is delivered directly to CAISO also with two new 500-kV

³⁵ See note 13 *supra*. (CalWEA June 28, 2017, IRP comments.)

³⁶ See note 23 *supra*. (RETI 2.0.)

³⁷ *Ibid*.

³⁸ See Ruling, Attachment A, slide 214 (PDF-page 215).

lines from each state into California, which resulted in a net cost of \$104 million/year in the 42 MMT case;^{39,40} and

- (3) an “unconstrained” wind sensitivity in which unconstrained amounts of Wyoming and New Mexico wind resources (with sufficient transmission directly from these resource areas into California based on the cost of two 500-kV lines) were made available to the model after 2026 (without PTC benefit). This case resulted in the model selecting 600 MW of additional New Mexico wind with modest ratepayer savings of \$2 million/year in the 42 MMT case.⁴¹
- (4) In addition, in these and other IRP cases, 500 MW of higher-cost New Mexico wind resources that could be wheeled to California at a rate of \$72/kW-year were also made available to the model (with or without PTC benefit depending on the scenario).

Not considered were New Mexico wind resources supported by the PTC, delivered to California with relatively low-cost transmission upgrades delivering wind into Arizona and then wheeled from Arizona into California with firm transmission. According to RETI 2.0, there are two such transmission upgrades now in an advanced stage of development (SunZia and Southline);⁴² these would not require CAISO approval or ratepayer funding as they will be funded by developers. CalWEA ran one such case, inserting 3,000 MW of New Mexico wind into the 42 MMT Reference case, using RESOLVE’s data for OOS wind energy costs (which may well be too high⁴³), costs for transmission upgrades as stated in the RETI 2.0 report,⁴⁴ actual

³⁹ See Ruling, Attachment A, slide 213 (PDF-page 214).

⁴⁰ Staff noted that the 500-kV line assumption “may understate the potential benefits to ratepayers.” Ruling, Attachment A, at slide 216 (PDF-page 217).

⁴¹ See Ruling, Attachment A, slide 253 (PDF-page 254).

⁴² See note 23 *supra*. (RETI 2.0.)

⁴³ For example, the June 28, 2017, Comments of Pattern Energy Group in this proceeding state that assumed costs of NM wind for use in RESOLVE are too high. Pattern cites the Direct Testimony of Riley Hill on behalf of Southwestern Public Service Company, filed with the New Mexico Public Regulation Commission on 3/21/2017 (Docket 17-00044-UT). This testimony identifies net capacity factors of 52% and an installed cost of \$1,581/kW for NM wind, which are more favorable than assumed by staff for use in RESOLVE for IRP.

⁴⁴ See note 23 *supra*. (RETI 2.0.) Using the same method used by staff for the 500-kV lines, CalWEA converted the capital costs of the SunZia line into annual transmission costs, arriving at a cost of \$92.61/kW-yr for 3,000 MW of New Mexico wind.

rates to wheel power from Arizona into CAISO via SRP (\$21.78/kW-year⁴⁵), and PTC benefits. This case shows ratepayer savings of \$3 million/year. These results are shown in **CalWEA Attachment 2**.

The validity of CalWEA's assumed New Mexico costs are supported by a 2015 power purchase agreement. **CalWEA Attachment 3** shows that the actual delivered price of wind energy from the Grady Wind Energy Center in New Mexico to the Sacramento Municipal Utility District (SMUD) is \$52/MWh. This compares to a delivered price of roughly \$65/MWh in CalWEA's RESOLVE run which showed the \$3 million/year savings. And wind energy costs are likely to have fallen further from those that led to the SMUD PPA price.⁴⁶ Further, the savings rise if export levels persist at current, very low levels, as noted in response part (b) to question 5, above. Thus, actual ratepayer benefits from New Mexico wind procurement are likely to be significantly higher than estimated by CalWEA's scenario run, above.

Further, there is substantial availability of firm transmission service from south-central Arizona (at the western ends of both the Southline and SunZia transmission projects) into the CAISO. The primary energy flows at that point in the transmission system are such that substantial capacity exists for energy transfers to the west, into California.

Question 9. Do you agree with the recommendation to utilize the 42 MMT Scenario for IRP planning purposes? Why or why not?

CalWEA Response:

Yes, CalWEA agrees with Staff that the Reference System Plan should reflect a statewide GHG Planning Target of 42 MMT for the electric sector, serving as the basis of individual LSE plans, because achieving GHG reductions in the electric sector is relatively straightforward

⁴⁵ Current wheeling rates for the Salt River Project are \$21.78/kW-year (see rate schedule posted at http://www.oatiaoasis.com/SRP/SRPdocs/Tariff_Rate_Summary_effective_4.1.2015.pdf). Current long-term firm transmission rates for WAPA's Parker Davis Project are \$17.52/kW-year (see <https://www.wapa.gov/regions/DSW/PowerMarketing/Documents/2018RateSched.pdf>). Additional wheeling options are available from Tucson Electric and other smaller providers. Arizona Public Service, which staff may have used along with wheeling rates from NM to AZ, charges higher wheeling rates at over \$43/kW-year (see: http://www.oasis.oati.com/AZPS/AZPSdocs/2017_Effective_Formula_Rates_20170601.pdf).

⁴⁶ See note 43 *supra*. (Pattern Energy comments.)

compared to other sectors which may face even greater challenges in meeting GHG targets. Further, as the Ruling notes (at p. 11), the choice of the GHG Scenario (42 MMT vs. 30 MMT) has a greater impact on the air pollution emissions in disadvantaged communities overall than any of the sensitivities containing changes to individual variables.

Moreover, we note that if the Commission rationalizes the IRP assumption with regard to BTM PV, the associated savings from reducing BTM PV would more than pay for the increased cost of achieving the 42 MMT target.⁴⁷

Question 10. Do you support the use of the Reference System Portfolio associated with the 42 MMT Scenario as the model for LSE portfolio planning for their individual IRPs? Why or why not?

Yes, should the Commission adopt the 42 MMT Scenario for IRP planning purposes, it would only make sense for LSEs to plan accordingly.

Question 11. Do you support transmitting the Default Scenario and associated portfolio to the CAISO for use as the reliability base case in the TPP for 2018? Why or why not?

CalWEA Response:

Given that the resource portfolio selected for the 42 MMT Reference Case is not simply an extension of the resource portfolio for the Default Reference Case, CalWEA believes that the 42 MMT Reference Case (the IRP planning scenario) should be transmitted to CAISO for TPP planning in 2018.

Question 12. Do you support transmitting the 42 MMT Scenario and associated portfolio to the CAISO for use as the policy-driven case in the TPP for 2018? Why or why not?

CalWEA Response:

Please see CalWEA response to Question 11.

⁴⁷ The 42 MMT Scenario is estimated by RESOLVE to cost approximately \$239 million more per year relative to the Default Scenario (Ruling at p. 14), whereas the savings associated with reducing BTM PV from 16 GW to 9 GW is \$444 million/year in the 42 MMT case (Ruling, Attachment A, PDF-page 202). Further savings would presumably be possible by further reducing BTM PV under current NEM rates.

Question 13. Should the RETI 2.0 work or other available information be incorporated into the TPP recommendations for 2017? If so, how?

CalWEA Response:

Yes, the information that the RETI 2.0 report has collected with regard to all options available to access out-of-state resources should be incorporated into the IRP RESOLVE modeling, as we have discussed in our response to Question 8, and then incorporated into TPP recommendations for 2017 (or 2018-19 TPP, given the advanced stage of the 2017-18 TPP).

Question 14. Do you support the staff recommendation for how LSEs should utilize the GHG Planning Price in preparing their individual LSE IRPs? Why or why not?

CalWEA Response:

CalWEA has no comment at this time.

Question 15. Do you support the staff recommendation for how LSEs should utilize the Reference System Portfolio in preparing their individual LSE IRPs? Why or why not?

CalWEA Response:

CalWEA has no comment at this time.

Question 16. Do you agree with the above-described relationship between the Reference System Portfolio and the GHG Planning Price? Why or why not?

CalWEA Response:

CalWEA has no comment at this time.

Question 17. Do you support the staff recommendation for calculating and assigned a GHG Emissions Benchmark for LSEs to use in preparing their individual LSE IRPs? Why or why not? Would you recommend an alternative means of developing a similar benchmark? Explain.

CalWEA Response:

CalWEA has no comment at this time.

Question 18. Do you support the staff recommendation for requiring IOUs filing Standard IRPs to submit revenue requirement and system average rate forecasts to

evaluate the impact of IRP costs on ratepayer costs of the IRP process? Why or why not?

CalWEA Response:

CalWEA has no comment at this time.

Question 19. Are there additional components that would need to be explored in order to develop a more comprehensive approach to conducting ratepayer impact analysis in later IRP cycles, for both IOUs and other LSEs? Explain.

CalWEA Response:

CalWEA has no comment at this time.

Question 20. Do you agree with the proposed requirements for LSEs to address the impact of their IRPs and any planned procurement on disadvantaged communities?

CalWEA Response:

CalWEA has no comment at this time.

Question 21: Should the Commission raise the RPS compliance requirement for 2030 and/or intervening years for all LSEs?

- a. If so, to what percentage?
- b. If so, in this proceeding or as a recommendation to be considered in the RPS rulemaking (or another venue: please specify)?

CalWEA Response:

These initial IRP results have shown that 58% renewables are cost-effective as a means of achieving a 42 MMT target.⁴⁸ However, IRP is in an early stage, with a lack of granularity on several important GHG-reduction options, such as energy efficiency and BTM PV. Thus, 58% may be too low or, less likely, too high. Therefore, the Commission should provisionally direct LSEs to plan to meet a 58% RPS target, but continue to refine that figure as IRP studies are refined. At this stage, it is most important to capture the fleeting benefits of expiring federal wind tax credits.

⁴⁸ Ruling, Attachment A at slide 58 (PDF-page 59).

Question 22: Should the Commission require additional renewable procurement outside of the RPS program? (a) Why or why not? (b) If so, how? (c) If so, at what level? (d) If so, from whom?

CalWEA Response:

As discussed in response to Question 5, CalWEA urges the Commission to require each of the IOUs to immediately conduct a wind-only procurement for up to 5,000 MW, with special focus on wind repowers, in order to capture expiring federal PTCs and substantial associated ratepayer savings, and to ensure at least a modest level of portfolio resource diversity. Given the limited time available to seize this opportunity, the Commission should act now to (a) direct this wind procurement within its decision on the RSP, and (b) direct the IOUs to apply elements of the RPS program where it would facilitate IRP-based procurement to occur on an expedited basis, e.g., by utilizing negotiable pro forma RPS contracts, non-negotiable standard contract options for small projects, independent evaluator and procurement review group participation, the current LCBF bid-evaluation and project-viability assessments (which are used both within and outside of the RPS program) to rank competing wind energy projects, and the RPS contract-approval process.

Question 23. Should the Commission initiate activities with the CAISO or others to investigate further development of out-of-state wind? a. Why or why not? b. If so, what specific steps should be taken? c. Should out-of-state wind be included in a special study or as part as a policy-driven scenario for TPP? d. Why or why not?

CalWEA Response:

There is no need to wait for a CAISO study on out-of-state wind before the Commission takes action to capture the benefits from expiring tax credits. As CalWEA has documented in response to Question 8, out-of-state wind can be accessed without any CAISO action, and it has already been investigated as part of RETI.

However, in accounting for OOS wind resources, three major flaws have occurred in the current IRP study:

- The estimated cost of OOS wind is too high;
- The transmission upgrades considered for OOS wind have not been optimized; and
- The wheeling rates considered for using the existing WECC transmission are overstated.

Given these flaws, and the substantial potential ratepayer benefits represented by OOS wind resources, a more careful examination of the potential to access OOS wind resources is warranted in order to more accurately capture the benefits of OOS wind resources.

Question 24. Should the Commission utilize the GHG Planning Price as an input to the IDER avoided cost calculator, as described in this ruling?

- a. Why or why not?
- b. Do you have specific recommendations for the appropriate methodology for use of the GHG Planning Price in IDER or other demand-side resource proceedings/activities? Describe in detail.

CalWEA Response:

CalWEA has no comment at this time.

Question 25. If the Commission were to engage in development of a CRVM:

- a. What resource areas should be prioritized for incorporation into the CRVM?
- b. Do you have specific recommendations for the appropriate structure of a CRVM? Include examples from other jurisdictions where possible.
- c. What would be the appropriate application of such a method?

CalWEA Response:

CalWEA has no comment at this time.

Question 26. Should the Commission initiate activities with the CAISO or others to analyze the type and viability of the natural gas fleet? What activities should be undertaken and why?

CalWEA Response:

CalWEA has no comment at this time.

Question 27. Please comment on the slides in Attachment A titled “Path to Future All-Resource Planning” with respect to the following:

- a. Are any of the conclusions, implications, or action items inappropriate? If so, how would you amend them?
- b. Are any conclusions, implications, or actions missing that the Commission should consider? Explain.

CalWEA Response:

CalWEA has no comment at this time.

Question 29. Please comment any aspect on the staff proposal included as Attachment E to this ruling. Explain the reasoning behind any recommended revisions. Please organize your comments according to the major topics of the proposal.

CalWEA Response:

CalWEA has no comment at this time.

Question 29. Please comment on the results and recommendations from the CES-21 grid integration project final report filed on September 12, 2017 in this proceeding. Note that the CES-21 project is complete and is not seeking comment to conduct additional work. The Commission seeks comment on:

- a. the technical merits of the analytical framework used in the CES-21 project
- b. what aspects of the CES-21 project (e.g., directional findings or recommendations, or the modeling techniques) can be used to improve the staff proposal in Attachment E, in the current or future IRP proceedings, and how.

CalWEA Response:

CalWEA has no comment at this time.

Respectfully submitted,

/s/ Nancy Rader
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On behalf of the California Wind Energy Association

October 26, 2017

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 “Comments of the California Wind Energy Association on Proposed Reference System Plan and Related Commission Policy Actions” 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 October 26, 2017, at Berkeley, California.

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

Attachment 1

CalWEA Attachment 1: Estimated California Wind Projects Likely To Be In Need of Repowering

Primary data sources: Expiring Contracts Shown in 2014 CPUC RPS Compliance Filings of PG&E, SCE & SDG&E

Spreadsheet available at: <http://www.calwea.org/public-filings>

Name	Utility RPS Compliance Filing	Technology	Contract Expiration Year	Nameplate Capacity (MW)	Location	PCC Classification or Contract Type
Altamont Power LLC (4-4)	PG&E	Wind	2015	19	Altamont Pass, CA	Qualifying Facility (QF)
Altamont Power LLC (6-4)	PG&E	Wind	2016	19	Altamont Pass, CA	Qualifying Facility (QF)
Patterson Pass Wind Farm LLC	PG&E	Wind	2015	22	Altamont Pass, CA	Qualifying Facility (QF)
Altamont Power LLC (3-4)	PG&E	Wind	2015	4.05	Livermore, CA	Qualifying Facility (QF)
International Turbine Research	PG&E	Wind	2018	34	Pacheco Pass, CA	Qualifying Facility (QF)
Subtotal - Altamont				98		
BNY Western Trust Company	SCE	Wind	2016	5.93	North Palm Springs, CA	PCC 0
Energy Development & Const. Corp.	SCE	Wind	2015	11.66	North Palm Springs, CA	PCC 0
EUI Management PH Inc.	SCE	Wind	2015	25.54	North Palm Springs, CA	PCC 0
Painted Hills Wind Developers	SCE	Wind	2015	19.27	North Palm Springs, CA	PCC 0
Difwind Farms Limited V	SCE	Wind	2016	7.9	Palm Springs, CA	PCC 0
Difwind Partners	SCE	Wind	2015	15.06	Palm Springs, CA	PCC 0
Dutch Energy	SCE	Wind	2020	8	Palm Springs, CA	PCC 0
FPL/WTE Acquisition	SDG&E	Wind	2019	16.5	Palm Springs, CA	
FPL Energy Cabazon Wind, LLC	SCE	Wind	2014	40	Cabazon, CA	PCC 0
NAWP Inc. (East Winds Project)	SCE	Wind	2015	4.17	Palm Springs, CA	PCC 0
Section 16-29 Trust (Altech III)	SCE	Wind	2015	32.87	Palm Springs, CA	PCC 0
Section 20 Trust	SCE	Wind	2015	13.51	Palm Springs, CA	PCC 0
Section 22 Trust (San Jacinto)	SCE	Wind	2015	18.95	Palm Springs, CA	PCC 0
Westwind Trust	SCE	Wind	2015	22.5	Palm Springs, CA	PCC 0
Iberdrola Renewables	SDG&E	Wind	2018	24.9	Riverside County, CA	
Mesa WindPower	SDG&E	Wind	2014	29.9	White Water, CA	
Alta Mesa Power Purchase Contract Trust	SCE	Wind	2018	27	Whitewater, CA	PCC 0
Subtotal - San Geronio Pass				324		
Cameron Ridge LLC (III)	SCE	Wind	2014	47.12	Mojave, CA	PCC 0
Cameron Ridge LLC (IV)	SCE	Wind	2015	12.76	Mojave, CA	PCC 0
CTV Power Purchase Contract Trust	SCE	Wind	2016	14	Mojave, CA	PCC 0
Desert Wind I PPC Trust	SCE	Wind	2019	48	Mojave, CA	PCC 0
Desert Wind II Power Purchase Trust	SCE	Wind	2020	75	Mojave, CA	PCC 0
Desert Wind III PPC Trust	SCE	Wind	2019	40.5	Mojave, CA	PCC 0
Oak Creek Energy Systems Inc.	SCE	Wind	2016	27.9	Mojave, CA	PCC 0
Oasis Power Partners	SDG&E	Wind	2019	60.0	Mojave, CA	
On Wind Energy, LLC	SCE	Wind	2017	2.4	Mojave, CA	PCC 0
Ridgetop Energy LLC (I)	SCE	Wind	2015	65	Mojave, CA	PCC 0
Ridgetop Energy LLC (II)	SCE	Wind	2018	28	Mojave, CA	PCC 0
Tehachapi Power Purchase Contract Trust	SCE	Wind	2016	56	Mojave, CA	PCC 0
Wind Resource I	PG&E	Wind	2022	8.71	Tehachapi, CA	RPS
Wind Resource II (1)	PG&E	Wind	2023	19.955	Tehachapi, CA	RPS
Aero Energy, LLC	SCE	Wind	2015	4.5	Tehachapi, CA	PCC 0
AES Tehachapi LLC 85-A	SCE	Wind	2015	17	Tehachapi, CA	PCC 0
AES Tehachapi LLC 85-B	SCE	Wind	2015	22.5	Tehachapi, CA	PCC 0
Coram Energy, LLC	SCE	Wind	2015	3	Tehachapi, CA	PCC 0
Mogul Energy Partnership I, LLC	SCE	Wind	2019	4	Tehachapi, CA	PCC 1
Sky River Partnership (Wilderness I)	SCE	Wind	2021	36.78	Tehachapi, CA	PCC 0
Sky River Partnership (Wilderness II)	SCE	Wind	2021	19.8	Tehachapi, CA	PCC 0
Sky River Partnership (Wilderness III)	SCE	Wind	2021	20.93	Tehachapi, CA	PCC 0
Terra-Gen 251 Wind, LLC (Monolith X)	SCE	Wind	2017	5.31	Tehachapi, CA	PCC 0
Terra-Gen 251 Wind, LLC (Monolith XI)	SCE	Wind	2017	4.99	Tehachapi, CA	PCC 0
Terra-Gen 251 Wind, LLC (Monolith XII)	SCE	Wind	2017	6.72	Tehachapi, CA	PCC 0
Terra-Gen 251 Wind, LLC (Monolith XIII)	SCE	Wind	2017	5.67	Tehachapi, CA	PCC 0
Victory Garden Phase IV Partner - 6102	SCE	Wind	2020	6.98	Tehachapi, CA	PCC 0
Victory Garden Phase IV Partner - 6103	SCE	Wind	2020	6.98	Tehachapi, CA	PCC 0
Victory Garden Phase IV Partner - 6104	SCE	Wind	2020	6.98	Tehachapi, CA	PCC 0
Wind Stream Operations LLC (Northwind)	SCE	Wind	2016	6.45	Tehachapi, CA	PCC 0
Wind Stream Operations, LLC (VG #2)	SCE	Wind	2014	6.93	Tehachapi, CA	PCC 0
Wind Stream Operations, LLC (VG #3)	SCE	Wind	2014	6.02	Tehachapi, CA	PCC 0
Wind Stream Operatos LLC (VG #4)	SCE	Wind	2015	6.77	Tehachapi, CA	PCC 0
Windland Inc. (Boxcar II)	SCE	Wind	2015	5	Tehachapi, CA	PCC 0
Subtotal - Tehachapi				709		
TOTAL REPOWER CANDIDATES (MW)				1130		

Note: A small fraction of these projects were repowered in 1998, before the federal tax credit was amended to discourage repowers. Even these facilities would be over 30 years old by 2030.

Projects Already Re-Contracted/Repowered/New (Assumed based on CPUC RPS Contract Database, public info or industry knowledge)

Buena Vista Energy	PG&E	Wind	2017	43	Byron, CA	RPS
Diablo Winds	PG&E	Wind	2016	18	Altamont Pass, CA	RPS
EDF Renewable Windfarm V, Inc.	PG&E	Wind	2017	10	Montezuma Hills	Qualifying Facility (QF)
EDF Renewable Windfarm V, Inc.	PG&E	Wind	2018	6.5	Benicia, CA	Qualifying Facility (QF)
Edom Hills Poject 1, LLC	SCE	Wind	2015	20	Palm Springs, CA	PCC 0
Green Ridge Power LLC	PG&E	Wind	2015	43.1	Tracy, CA	Qualifying Facility (QF)
Green Ridge Power LLC	PG&E	Wind	2018	15	Tracy, CA	Qualifying Facility (QF)
Green Ridge Power LLC	PG&E	Wind	2015	144.1	Livermore, CA	Qualifying Facility (QF)
Green Ridge Power LLC	PG&E	Wind	2016	10.8	Tracy, CA	Qualifying Facility (QF)
Green Ridge Power LLC	PG&E	Wind	2018	5.9	Tracy, CA	Qualifying Facility (QF)
Green Ridge Power LLC	PG&E	Wind	2015	54	Tracy, CA	Qualifying Facility (QF)
Mountain View Power Partners, LLC	SCE	Wind	2021	66.6	North Palm Springs, CA	PCC 0
San Geronio Westwinds II, LLC (partial)	SCE	Wind	2015	10	Palm Springs, CA	PCC 0
Shell-Cabazon-Whitewater	SDG&E	Wind	2013	102.4	Palm Springs, CA	
Shiloh I Wind	PG&E	Wind	2021	75	Birds Landing, CA	RPS
Windland Inc. (Boxcar II) (Partial)	SCE	Wind	2015	3	Tehachapi, CA	PCC 0
Total Assumed Repowered (MW)				627.4		

Attachment 2

CalWEA Attachment 2: RESOLVE RUN SUMMARY

Supporting spreadsheets available at: <http://www.calwea.org/public-filings>

Case number	Case name	RESOLVE case name	Case description	Levelized Total Resource Cost (\$/MM)	Difference from Reference	
1	IRP Reference	42mmt_Ref_20170831	IRP Reference 42 MMT	\$44,326	\$0	
2	CalWEA NM Wind Tx Pre PTC Expiration	calwea_42mmt_NMWind_LowerTxCost_2018	Reference 42 MMT with 3000 MW New Mexico wind built pre PTC expiration and CalWEA Tx assumptions	\$44,323	(\$3)	
3	CalWEA Retire Existing Wind & No Repowers	calwea_42mmt_Ref_norepowers	Reference 42 MMT with 1131 MW of existing CAISO wind removed	\$44,512	\$186	Difference from No Repowers case
4	CalWEA Retire Existing Wind & Repowers	calwea_42mmt_Ref_repowers	Reference 42 MMT with 1131 MW of existing CAISO wind removed and allowed to be repowered	\$44,476	\$150	(\$36)
5	IRP Low BTM PV	42mmt_Ref_low_btmapv_20170831	Reference 42 MMT with Low BTM PV	\$43,644	(\$682)	Difference from IRP Low BTM PV case
6	CalWEA Low BTM PV & NM Wind Tx Pre PTC Expiration	calwea_42mmt_NMWind_LowerTXCost_2018_low_btmapv	Reference 42 MMT with Low BTM PV, 3000 MW New Mexico wind built pre PTC expiration and CalWEA Tx assumptions	\$43,629	(\$697)	(\$15)
7	CalWEA Zero Exports	calwea_42mmt_Ref_ZeroExports	Reference 42 MMT with Zero Exports	\$44,483	\$157	Difference from CalWEA Zero Exports case
8	CalWEA Zero Exports & NM Wind Tx Pre PTC Expiration	calwea_42mmt_NMWind_LowerTxCost_2018_ZeroExports	Reference 42 MMT with Zero Exports, 3000 MW New Mexico wind built pre PTC expiration and CalWEA Tx assumptions	\$44,445	\$119	(\$38)
9	CalWEA No In-State Wind	calwea_42mmt_Ref_NoInStateWind	Reference 42 MMT without In-State Wind Candidate Resources	\$44,361	\$35	

Attachment 3

Revision No.
1
Date & Time
Initials

BOARD AGENDA ITEM

STAFFING SUMMARY SHEET

SSS No. 15-079

Committee Meeting & Date
Energy Resources & Customer Services – September 30, 2015
Board Meeting Date
October 1, 2015

Please use a separate sheet if you have any comments.

TO	MAIL STOP	ACTION	INITIAL*	DATE	TO	MAIL STOP	ACTION	INITIAL*	DATE		
1. Gary Lawson	A404	Conc	<i>GL</i>	9/23/15	7.						
2. Jessica Kasparian	A404	Conc	<i>JK</i>	9/23/15	8. Nicole Howard	A312	Conc	<i>NH</i>	9/25/15		
3. Mark Alberter	B257	Conc	<i>MA</i>	9/24/15	9. Frankie McDermott	A312	Conc	<i>FM</i>	9/25/15		
4. Steve Sorey	A404	Conc	<i>SS</i>	9/24/15	10. Paul Lau	A312	Conc	<i>PL</i>	9/25/15		
5. Bryan Swann	A451	Conc	<i>BS</i>	9/24/15	11. Legal	A311	CONC	<i>LL</i>	9/25/15		
6. Scott Martin	A451	Conc	<i>SM</i>	9/24/15	12. General Manager	A312	APPR	<i>GM</i>	9/25/15		
Consent Calendar <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, schedule a dry run presentation.					Budgeted <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If no, explain in Cost/Budgeted section.)						
FROM (IPR) Cesar Beltran					DEPARTMENT Energy Trading and Contracts			MAIL STOP A404		EXT. 6925	DATE SENT 9/22/15

NARRATIVE:

Requested Action: Authorize the CEO and General Manager, or his delegate, to execute a renewable Power Purchase Agreement (PPA) with Grady Wind Energy Center LLC (an affiliate of Pattern Renewables LP) for approximately 200MW of wind power at a levelized cost estimated to be \$52/MWh over a 25-year period.

Summary: Early this year SMUD received unsolicited offers from three different developers, actively marketing five wind energy projects that were scheduled to become operational in the next few years. The prices offered were low, reflecting market drop in renewable pricing due to manufacturing cost reduction for wind turbines, larger scale of projects, federal tax credit, and high available wind energy, especially in the New Mexico region (two projects are from New Mexico).

SMUD performed an evaluation of the five projects and determined that the New Mexico project to be developed by Grady Wind Energy Center LLC (an affiliate of Pattern Renewables LP) provided the best value to SMUD. SMUD subsequently negotiated a PPA with Grady Wind Energy Center LLC, under which SMUD will purchase 200MW of wind power, including the energy, capacity, and environmental attributes at a cost expected to be \$52/MWh levelized over the 25-year term of the PPA. The project is expected to be in commercial operation by December 31, 2016.

Seller delivers energy into the California Independent System Operator (CAISO) over transmission lines in New Mexico and Arizona, for delivery at the CAISO Four Corners Delivery Point. SMUD is obligated to pay the difference (or receive the benefit) between price energy sold into the CAISO and the PPA price (same model as Solano and Highwinds Projects). Additional key terms include: (1) Renewables Portfolio Standard (RPS) Product Content Category 1 (Bucket 1) RECs, (2) SMUD receipt of project capacity benefit (Resource Adequacy) and (3) CAISO Economic Bid curtailment to avoid CAISO "negative pricing" episodes.

PPA also contains seller options to: (1) Delay project by 1 year based on federal tax credit availability and (2) Substitute the Grady Project for an adjacent wind project under CPUC review, at a \$0.10/MWh discount and option to add additional capacity if project becomes available due to CPUC disapproval (unlikely).

SUBJECT	Grady Wind Energy Center LLC Renewable Energy PPA for Wind Power	ITEM NO. (FOR LEGAL USE ONLY)
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ITEMS SUBMITTED AFTER DEADLINE WILL BE POSTPONED UNTIL NEXT MEETING.

Board Policy: SD-7, Environmental Leadership and helping to reduce SMUD's carbon footprint by generating electricity with renewable wind & SD-9, Resource Planning and making a contribution to SMUD's 33% RPS goal by purchase of wind energy.
(Number & Title)

Benefits: Provides for continued delivery of competitively priced renewable power. This purchase of power goes to meeting SMUD's 33% RPS goal (and the SB 350 mandate for 50% by 2030) and reducing our carbon footprint.

Cost/Budgeted: Starting in 2017 approximately \$43 Million for deliveries each year of renewable power escalated at 1.5% annually during the twenty-five (25) year term of the project, for a levelized cost estimated to be \$52/MWh.

Alternatives: Find another source for renewable energy.

Affected Parties: Energy Trading & Contracts and Grady Wind Energy Center LLC.

Coordination: Cesar Beltran

Presenter: Cesar Beltran

SUBJECT

Grady Wind Energy Center LLC Renewable Energy PPA for Wind Power

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