

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



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Order Instituting Rulemaking to Continue
Implementation and Administration, and Consider
Further Development of, California Renewables
Portfolio Standard Program.

Rulemaking 15-02-020
(Filed February 26, 2015)

**COMMENTS OF THE INDEPENDENT ENERGY PRODUCERS
ASSOCIATION ON LEAST-COST/BEST-FIT REFORM**

**INDEPENDENT ENERGY PRODUCERS
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On June 22, 2016, Administrative Law Judge Anne Simon issued a ruling calling for comments on a staff paper prepared by the Commission's Energy Division on reform of the least-cost/best-fit (LCBF) methodology for evaluating bids submitted in solicitations to procure products from resources that are eligible under the state's Renewables Portfolio Standard (RPS). The Independent Energy Producers Association (IEP) appreciates the ruling's focus on improving the RPS LCBF methodology, because the annual RPS solicitations are the primary tools by which the utilities (and by extension the Commission) seek to procure a balanced and useful portfolio of renewable resources to meet the goals of the RPS in light of other procurement processes and statewide policies.

Consideration of the appropriate reforms to the LCBF methodology is particularly important at this time due to the planned replacement of the output of the Diablo Canyon nuclear facility with clean energy. While intermittent solar and wind energy facilities may not seem to be the best candidates to replace a 2,200 MW baseload facility, RPS-eligible renewable resources are not limited to wind and photovoltaic technologies; they include a broad range of

baseload, intermittent, and flexible technologies. Accordingly, a properly constructed portfolio of renewable resources has the potential to match up well with the impending need to replace Diablo Canyon. However, the procurement of the renewable resources making up this portfolio should not await final closure of the Diablo Canyon units in 2024 and 2025. Procurement ought to begin as early as 2018, for two reasons. First, the schedule of procurement should account for the 24-36 months required to complete a RPS procurement process at the Commission (*i.e.*, to move from RPS Procurement Plan submittal and approval, to undertaking and processing the Request for Offers (RFO), through Commission approval of a contract). Second, RPS procurement processes beginning in 2018 should be shaped to meet Senate Bill (SB) 350's intermediate goal of 40% renewable energy by 2024.¹ The current round of LCBF reform must consider the need to replace Diablo Canyon's capacity and to comply with SB 350 so that the adopted LCBF reforms can govern renewables procurement in the 2018-2020 timeframe.

While future LCBF reform and the critical issues raised in the staff paper are important, the Commission should take three additional actions that affect LCBF bid evaluation, renewables procurement, and policy implementation.

- The Commission should assess the extent to which changes to the LCBF methodology adopted and implemented in the past have affected procurement outcomes. As noted in the staff paper, LCBF reform has been a continuous process since 2002. Notably, the 2012 LCBF reforms were significant and should have impacted procurement outcomes in 2013-2015. In the context of the Commission's consideration of additional LCBF reforms and what "best fit" means, an assessment of the extent to which the 2012 reforms actually changed

¹ Pub. Util. Code § 399.15(b)(2)(B).

procurement outcomes in aggregate (*e.g.*, by resource type) would be informative.

As part of this assessment, the Commission should evaluate (1) the number of bids in each RFO, (2) the proportion of bids by each renewable technology, (3) the proportion of shortlisted projects by technology, and (4) the proportion of completed projects by technology.

- The Commission should assess how the utilities and the California Independent System Operator (CAISO) anticipate and manage forecasted conditions of overgeneration, and how this information impacts the application of the LCBF methodology in actual procurement. This assessment should include a determination of the extent of the utilities' contractual economic curtailment rights, the potential for emergency or reliability curtailments initiated by the CAISO, and the extent to which these tools are expected to be effective in managing forecasted overgeneration.
- The answers to the questions the staff paper poses to utilities will be valuable to the overall discussion of LCBF reform. To further transparency while maintaining consistency with the rules regarding confidentiality (*e.g.*, Decision (D.) 06-06-066, the Commission should require the utilities to draft answers to each of the questions posed in the staff paper so that they can be viewed in unredacted form by all parties to facilitate a robust discussion of all the issues raised in this proceeding.

In advance of having an opportunity to review and assess the utilities' responses to the staff paper's questions, IEP will not comment on all of the questions but will offer the following thoughts for the Commission's consideration.

I. THE NEED FOR LCBF REFORM

Consideration of LCBF reform is graphically illustrated by the now-familiar duck curve developed by the CAISO. This graphic reveals how changes in demand (driven significantly by the growth of behind-the-meter rooftop solar) and changes in the resource mix (including RPS resources that have been subject to LCBF consideration) have created sharp ramps in net demand that are forecasted to become even sharper in future years. At this point, the duck curve might be attributed either to a lack of consideration “best fit” in resource procurement or factors unrelated to the RPS (*e.g.*, increasing behind-the-meter generation and changing net load impacts). Depending on which of these explanations is correct, the form and substance of LCBF reform may take on different characteristics.

Irrespective of the impact of RPS procurement on the duck curve, the evidence suggests that a key component of LCBF, namely “best fit,” has been reduced to secondary consideration in bid evaluation.² This phenomenon has occurred in spite of the near-continuous LCBF reforms, particularly those accomplished in 2012. As noted in the staff paper, the LCBF reforms of 2012 (D.12-11-016) adopted the Net Market Value and the Adjusted Net Market Value calculations, “explicitly defining a core set of LCBF elements and basic analytical framework for aggregating those elements.” Accordingly, it is important and timely to ask, *Did the past reforms, particularly those in 2012, succeed and, if so, are the reforms raised in the staff paper sufficient, by themselves, to mitigate the duck curve?* In the context of LCBF reform, it is time to focus on how best to bring “best fit” back into the procurement equation.

² IEP distinguishes between reforms designed to effect a better match of resource development to the needs of the grid (“best fit”) and simple updates to various factors used to assess “least cost” (*e.g.*, energy cost, capacity cost, transmission cost, and integration cost).

II. GUIDING PRINCIPLES

IEP's comments on LCBF reform are guided by two basic principles: transparency and stability.

A. Transparency

With regard to reform of the LCBF methodology, developers of renewable generation resources have one primary and essential question for utilities procuring renewable resources: “What specifically is it you want?” The renewable generation industry is positioned to provide the utilities the types of products and resources they want when and where they want them. However, the lack of clear market signals early in the development process and the lack of transparency about the relative value of the various factors embedded in the LCBF bid evaluation methodology contribute to the unfortunate and unproductive “guessing game” faced by renewable developers today, and this uncertainty has significant implications for transmission planning and interconnection queue management.

The lack of transparency in the LCBF methodology is partly due to the utilities' reluctance to reveal to market participants the relative values it assigns to the factors it uses in bid selection. It is important to clarify that renewable generation developers need information only about the *relative* value of various factors, not the *actual* values assigned to individual variables in a utility's proprietary model. For example, if Factor A is worth 10 and Factor B is worth 5, the RFO process would be better informed if bidders knew that Factor A was valued twice as high as Factor B.

In the past, utilities seemed to fear that revealing too much information about their resource needs would lead to “gaming” by bidders and inefficient procurement. Yet, today all aspects of electricity markets, particularly the renewable energy market, are highly competitive, and withholding information about the utility's needs leads only to inefficient procurement and

misdirection of bids. Rather than being opaque or coy about its needs, a utility should tell the market what attributes it values and how it values those attributes relative to other attributes it considers, and then let the competitive market respond with the most innovative and efficient ways to provide those attributes.

In similar contexts, the Commission has required the utilities to provide a higher level of transparency. In the Renewable Auction Mechanism (RAM)³ and Solar Photovoltaic programs,⁴ for example, the utilities were required to develop maps or other presentations that clearly identified how much generation capacity could be accommodated on specific distribution circuits and substations without the need for upgrades, or were otherwise required to identify the preferred locations for optimizing the locational value of the project. As far as IEP knows, the release of this information did not result in gaming or distortion of the solicitations. Instead, bidders were able to identify the locations that were likely to provide the greatest value and require the least cost and least delay.

The lack of transparency arguably is a contributing factor to the growing misalignment of generation products to needs. If the utility has a need for #2 pencils, it should not issue a solicitation for “cylindrical graphite recording devices.” Similarly, if a utility has a need for resources in a certain location, it should not issue a generic solicitation and hope that some of the bids are for projects in the desired location. Instead, the utility should clearly state that the resource should be sited in the desired location, or at least clarify how projects in other locations will be evaluated by quantifying the cost of transmission from other locations to the desired project site.

³ D.10-12-048, pp. 70-72, 92 (Conclusion of Law No. 44).

⁴ D.09-06-049, p. 42; D.10-04-052, pp. 80-01 (Ordering Paragraphs Nos. 9, 10); D.10-09-016, pp. 48-49 (Ordering Paragraphs Nos. 4, 5).

B. Regulatory and Contractual Stability

The Commission can and should revise and update Time of Delivery (TOD) factors to reflect changes in the grid. The staff paper notes that TOD factors can provide an incentive for greater energy deliveries when demand is high, and that TOD factors should be adjusted as load patterns change. However, the necessity of responding to changing demand patterns should not undermine the integrity of existing power purchase agreements (PPAs) between suppliers and buyers during the term of the agreements. Changing TOD factors or other crucial terms while the PPA is in effect will complicate the project's financing and the forecasting of the project's output. More generally, financing of RPS projects will be more difficult and more costly if the Commission allows the utilities to apply changed TOD factors in approved PPAs.

III. ALIGNMENT OF PROCUREMENT AND DELIVERABILITY STATUS

The issue of deliverability status is a focus of the staff paper in its discussion of the valuation of projects with energy-only deliverability. Since its inception in 2002, the RPS was designed as an energy-based procurement obligation (kWh). Over time, faced with a resource adequacy (RA) obligation, the utilities sought the ability to count RPS resources against their RA obligations. As the RPS obligation grew as a percentage of retail sales, the utilities increasingly sought to acquire as much RA value as they could from the procurement of RPS resources. As a result, RPS RFOs sent signals to the marketplace that greater RA capacity, *i.e.*, full or partial deliverability, from RPS resources would be more highly valued. In response to this market signal, RPS developers increasingly asked for evaluation of Full Capacity Deliverability Status (FCDS) in their interconnection studies.

As a practical matter, renewable generation developers today face a “chicken or egg” conundrum with regard to deliverability status. To be eligible to bid in an RPS RFO,

developers need to be in the CAISO queue and have completed their Phase 2 interconnection studies. Reaching this point requires significant capital investment. It also requires the developer to choose a deliverability status, *i.e.*, energy-only or FCDS, for evaluation in the interconnection studies. FCDS may require additional capital commitments for transmission upgrades needed for full deliverability. Transmission planning might also be impacted by projects' choice of deliverability status. Under the cluster approach to CAISO interconnection studies, changing one project's deliverability status might affect other developers' projects. Developers are compelled to make choices regarding deliverability status early, and these choices are difficult to change later if buyers' needs change.

IV. RESPONSES TO QUESTIONS

IEP offers the following responses to certain of the questions posed in the staff paper.

A. Capacity Price

The Commission has posed to the utilities a number of questions related to the development of estimates of future capacity prices and capacity valuation. The answers to these questions will be critical to the dialog regarding future LCBF reform. IEP plans to respond in reply comments after having assessed the utilities' responses to these questions.

B. TOD Factors

In **Question 4**, the staff paper instructs parties to “clearly distinguish between the function of TOD factors used to rank bids through in LCBF criteria and TOD factors included in contracts and used as the basis for payments.”

The TOD factors used in PPAs should reflect how the buyer values deliveries at the time procurement is taking place. At the time an RPS solicitation is issued, the TOD factors in the bidding protocols or pro forma PPA should be identical to the TOD factors used to

evaluate the resulting bids. Bidders can and will respond to the incentives represented by the TOD factors. If the buyer values deliveries in late afternoon more highly and sets the TOD factors accordingly, for example, solar photovoltaic project developers will respond by orienting their panels to the west or integrating storage into the facility to increase production when deliveries are most highly valued.

Once the TOD factors are incorporated into a signed PPA, they should not be subject to change over the term of the PPA. Stability of the terms of the PPA is required for efficient development and financing of generation projects, as discussed above. Succeeding tranches of renewable PPAs will reflect any changes in the buyer's valuation of deliveries over time, and the resulting diversified portfolio should help avoid the technology concentrations that led to the duck curve.

Question 5 asks, "How effective are TOD factors at incentivizing renewable energy resources to shift the timing of their production?" To state the obvious, the effectiveness of TOD factors depends on the size of the incentive. A TOD factor of 1.0, as SDG&E has proposed, would have no effect on the timing of production. If the TOD factor is large enough, *i.e.*, if the buyer values deliveries at certain times highly, then developers of renewable energy projects will respond in innovative and creative ways. Solar and wind energy projects, for example, are sometimes said to be immune to production incentives, but solar panels can be oriented to maximize production at certain times. Solar and wind facilities can use storage to shift deliveries from times when TOD factors are low, *i.e.*, when the buyer's valuation of deliveries is low, to times when deliveries are more highly valued. Incentives created by TOD factors can also lead to technological innovation that cannot presently be imagined.

As noted above, closing the Diablo Canyon nuclear facility may create the need for a broader portfolio of resources to replace this 2,200 MW baseload facility. This emerging need should be considered when evaluating the most effective TOD factors for future renewable procurement.

Finally, the Commission should take this opportunity to review the TOD factor changes that have been made over the years and to assess their impact on procurement outcomes. This review need not be complicated, but it would be helpful to know whether changes in TOD factors in the past have resulted in noticeable changes in the aggregate resource mix in successor RPS solicitations.

C. Valuation of Energy-Only Deliverability Status

The staff report notes that despite the fact that “the CAISO system has the potential to absorb over 20,000 MW of renewable resources with energy-only deliverability status, . . . no IOUs have PPAs approved through the Commission’s RPS program with energy-only resources.”⁵ This is hardly surprising in light of the requirements and incentives regarding full deliverability that have been incorporated into the RPS program over the last decade.

Utilities meet their RPS obligations by retiring the required amount of Renewable Energy Credits (RECs), based on their total retail energy sales. RECs are created when Eligible Renewable Energy Resources, as defined by the California Energy Commission, generate energy, and the most valued Portfolio Compliance Categories established in Public Utilities Code section 399.16 bundle MWh of renewable energy with the associated RECs. As a result, the focus of the utilities’ RPS procurement is on energy. Nevertheless, renewable resources have some amount of Net Qualifying Capacity (NQC) that can help utilities meet their obligations to procure capacity under the Commission’s Resource Adequacy program. A resource’s NQC is

⁵ Staff Paper, p. 13.

affected by its level of deliverability, and the NQC of a renewable resource is maximized if it obtains FCDS.

Thus, currently the incentive for a renewable resource to obtain FCDS, rather than energy-only deliverability status, is high for both buyers and sellers. The utility-buyer benefits because (1) there is greater assurance that the renewable energy and RECs it purchases under the PPA will actually be delivered without running into transmission constraints, and (2) the project acquires a higher NQC that the utility can use to meet its RA obligations. The seller benefits (1) from greater assurance that its energy will be delivered and (2) frequently from higher TOD factors, resulting in higher revenues. To cite one example, Southern California Edison Company's RAM 4 pro forma PPA offered a TOD factor of 2.77 for resources with FCDS during the summer on-peak period, when solar facilities achieve their maximum production. The TOD factor for energy-only resources for the same period was 1.11.

The staff paper notes that the Commission has determined that TOD factors for RPS resources should reflect the need for additional capacity.⁶ Accordingly, the utilities' LCBF methodology appears to have valued RPS resources with FCDS more highly, resulting in the apparently exclusive procurement of resources with FCDS. The staff paper now asks, logically enough, whether FCDS, which maximizes the *capacity* value of renewable resources, is needed in all cases for procurement of RPS-eligible *energy* and RECs, and whether energy-only deliverability might be the LCBF choice in some cases.

The staff paper asks several questions on this topic:

Question 12: Would enabling owners of energy-only resources to bid the cost of the transmission upgrade required to convert their projects to full capacity deliverability status be a reasonable approach for mitigating the potential risk that an increase in

⁶ Staff Paper, p. 9, citing D.06-05-039, p. 69.

energy-only resources could lead to a decline in system-wide resource adequacy?

Question 13: Do current policies and practices permit a project owner to convert an existing project with energy-only deliverability status to a full capacity project in order to offer that project as a capacity resource? If no, what changes would be required to enable such an action? If yes, what policy or market practices would facilitate the ability of project owners to undertake such an action?

Question 14: What changes, if any, to resource adequacy accounting would best support an economically optimal level of energy-only project procurement?

As noted above, the effort to answer these questions soon runs into a chicken or egg dilemma. To help ensure project viability, the Commission currently requires bidders in RPS solicitations to have completed a Phase 2 interconnection study. At the start of the interconnection study process, however, the sponsors of the project must elect which status, energy-only, FCDS, or partial capacity deliverability status, will be studied for the project. The sponsor must also make a deposit of \$150,000 to cover the costs of the interconnection study.⁷ Within ten days of the release of the Phase 1 Interconnection Study Results Meeting, a resource may switch from FCDS to energy-only deliverability status or partial capacity deliverability status or reduce the fraction of partial capacity deliverability status, but the resource cannot at that point switch from energy-only status to FCDS.⁸

The Phase 1 study attempts to provide an estimate of the cost of upgrades for the study cluster's deliverability request and sets the maximum cost responsibility for each project. However, bidders won't receive the final assessment of the cost of the upgrades required for FCDS until the completion of the Phase 2 interconnection study. Moreover, the costs of upgrades for FCDS will not be studied or calculated for bidders who have elected energy-only

⁷ CAISO Tariff, Appendix DD, § 3.5.1(i).

⁸ CAISO Tariff, Appendix DD, § 6.7.2.2.

status for the interconnection (Question 12). A project with energy-only status may seek FCDS through the CAISO's annual deliverability study process, but it will be awarded FCDS only to the extent that capacity is available on the existing transmission system; no costs of upgrades will be calculated⁹ (Question 13).

The answer to Question 14 has some far-reaching implications. Resource adequacy accounting is appropriate for its primary purposes of ensuring that the CAISO has enough generation resources, in the locations it needs them, with the operational characteristics that it needs to balance supply and demand and reliably operate the grid. The CAISO adjusts a resource's Qualifying Capacity, as defined by criteria adopted by the Commission, to reflect the level of deliverability, *i.e.*, the resource's ability to deliver energy when needed. What may need adjustment is how the utility values FCDS versus energy-only status in the LCBF methodology. The Commission previously rejected proposals to require FCDS status for RPS resources,¹⁰ but the utilities' LCBF approach has effectively accomplished the same result. And it is now becoming apparent that the LCBF methodology did not accurately determine the best-fit resources from a system perspective; hence, the duck curve.

Part of the problem may be that the bids in RPS solicitations are structured as energy bids, as a price per kWh. The LCBF methodology must then value the capacity (kW) implicit in the bid, which will include consideration of the resource's deliverability status and NQC. The Commission has stated that it expected that "IOUs incorporate RA adequacy into their LCBF methodologies. Thus, IOUs are able to assess the RA value differential, if any, of a project interconnecting at energy-only versus full deliverability."¹¹ The results of the LCBF methodology over the last few years suggest that the utilities may be valuing capacity too highly,

⁹ CAISO Tariff, Appendix DD, § 9.2.

¹⁰ D.11-04-030, pp. 20-22.

¹¹ D.11-04-030, p. 22.

at least in some locations. If utilities were more transparent about how they value capacity in specific locations (similar to the RAM and solar photovoltaic program information), sellers would be better able to provide capacity and FCDS where needed, and to site lower-priced energy-only renewable energy project in areas where capacity is less valued.

V. CONCLUSION

For the reasons stated in these comments, the Independent Energy Producers Association respectfully urges the Commission to incorporate the important principles of transparency and regulatory and contractual stability into its consideration of LCBF reform. In addition, IEP urges the Commission to:

- Assess the extent to which previous changes to the LCBF methodology have affected the results of subsequent solicitations;
- Review how the utilities' contractual curtailment rights are managed to respond to forecasted overgeneration; and
- Require the utilities' responses to the staff paper's questions to be presented in an unredacted form that all parties can view.

Respectfully submitted this 22nd day of July, 2016 at San Francisco, California.

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By /s/ Brian T. Cragg

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VERIFICATION

I am the attorney for the Independent Energy Producers Association in this matter. IEP is absent from the City and County of San Francisco, where my office is located, and under Rule 1.11(d) of the Commission's Rules of Practice and Procedure, I am submitting this verification on behalf of IEP for that reason. I have read the attached "Comments of the Independent Energy Producers Association on Least-Cost/Best-Fit Reform," dated July 22, 2016. I am informed and believe, and on that ground allege, that the matters stated in this document are true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 22nd day of July, 2016, at San Francisco, California.

/s/ Brian T. Cragg
Brian T. Cragg