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BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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)

**ADMINISTRATIVE LAW JUDGE'S RULING ACCEPTING INTO
THE RECORD ENERGY DIVISION STAFF PAPER ON
LEAST-COST BEST-FIT REFORM FOR RENEWABLES PORTFOLIO
STANDARD PROCUREMENT AND REQUESTING COMMENT**

Background

The procurement process for compliance with the renewables portfolio standard (RPS) program¹ has included almost from its inception the use by the investor-owned utilities (IOUs) of a least-cost best-fit (LCBF) methodology for evaluation of bids. The LCBF methodology is periodically reviewed by the Commission and has been the subject of several statutory revisions.²

Energy Division staff has developed a paper on LCBF reform that proposes a set of objectives, presents a draft work plan, and identifies a number of questions for party comment. This paper, "Energy Division Staff Paper on

¹ The RPS program is currently codified at Pub. Util. Code §§ 399.11-399.32. All further references to sections are to the Public Utilities Code, unless otherwise specified.

² The history of LCBF in the RPS program is reviewed in the Staff Paper, at 1-2. The most recent statutory directives related to LCBF are found in Senate Bill (SB) 2 (1X) (Simitian), Stats. 2011, ch. 1, and SB 350 (De León), Stats. 2015, ch. 547.

Least-Cost Best-Fit Reform" (June 6, 2016) (Staff Paper) is attached to this ruling as Attachment A and is hereby accepted into the record of this proceeding.

Comments

In order to make it easier for parties to connect the questions to the information in the Staff Paper on the topics related to LCBF reform, the questions for comment are embedded in the Staff Paper itself, and are not repeated in this ruling. Comments should address each question presented. It is not necessary to reproduce the question, but responses should be numbered to match the questions addressed, or otherwise clearly identify the issue being discussed.

Comments should be as specific and precise as possible. Legal arguments should be supported with specific citations. Where appropriate and useful, quantitative examples should be provided. For all information provided, parties should explicitly include all assumptions and data sources used, including links. For any supporting calculations or work papers, parties should include Excel workbooks with live, working formulas rather than hard-coded values.

Comments should be complete in themselves and should not incorporate by reference any other materials. Other materials necessary to the response should be attached, or, if the materials are available on a web site, the link to the materials should be given. All comments should use publicly available materials. All comments should specifically identify, with respect to each question, whether any potential sources of information addressed in the response to the question are confidential.

Parties may identify and comment on issues that are not addressed in the questions set out in the Staff Paper. Commenters doing so should clearly identify and explain the relevance of the additional issue(s).

Note that one task (identified as Question 1) asks for a joint proposal from the three large IOUs for a standardized methodology and set of inputs and assumptions for estimating future capacity prices.³ The submission of the joint proposal and party comments responding to it are subject to a different schedule from the comments and reply comments on all the other questions (numbered 2-18) set out in the Staff Paper.

Comments on Questions 2-18 may be filed and served not later than July 22, 2016. Comments may not exceed 40 pages. Reply comments of not more than 25 pages may be filed and served not later than August 9, 2016.

The joint IOU proposal identified in Question 1 must be filed and served not later than September 8, 2016. Comments on the joint proposal, not to exceed 40 pages, may be filed and served not later than September 30, 2016. Reply comments of not more than 20 pages may be filed and served not later than October 14, 2016.

IT IS RULED that:

1. The Energy Division Staff Paper on Least-Cost Best-Fit Reform (June 6, 2016) (Staff Paper) is accepted into the record of this proceeding.
2. Comments on Questions 2-18 set out in the Staff Paper may be filed and served in accordance with the instructions in this ruling not later than July 22, 2016. Comments may not exceed 40 pages.
3. Reply comments on Questions 2-18 may be filed and served not later than August 9, 2016. Reply comments may not exceed 25 pages.

³ This task is analogous to the task identified in the Administrative Law Judge's Ruling Accepting into the Record Revised Energy Division Staff Paper on the Use of Effective Load Carrying Capability for Renewables Portfolio Standard Procurement and Setting Schedule (March 9, 2016).

4. The joint proposal of the three large investor-owned utilities identified in Question 1 set out in the Staff Paper must be filed and served not later than September 8, 2016.

5. Comments on the investor-owned utilities' joint proposal, not to exceed 40 pages, may be filed and served not later than September 30, 2016. Reply comments of not more than 20 pages may be filed and served not later than October 14, 2016.

Dated June 22, 2016, at San Francisco, California.

/s/ ANNE E. SIMON

Anne E. Simon
Administrative Law Judge

Attachment A

Energy Division Staff Paper on Least-Cost Best-Fit Reform

1. Introduction

The legislation creating the Renewables Portfolio Standard (RPS) program in California in 2002 (SB 1078) required the Commission to develop a process for ranking and selecting “least cost and best fit” (LCBF) renewable resources to fulfill program obligations.¹ In D.03-06-071,² the Commission began implementing the requirements of SB 1078. That decision established the structure of the RPS solicitation process, requiring utilities to file annual procurement plans and requiring review and CPUC approval of the winning RPS bids that were ultimately executed by the utilities. The decision also established the first set of criteria for a LCBF ranking and selection process, which included energy cost, capacity cost, transmission cost, and integration cost.³ This and subsequent decisions have given substantial flexibility to utilities to develop their own individual LCBF methodologies for evaluating bids, provided that a transparent rationale was also provided and shared with their respective Procurement Review Groups.

LCBF was further refined through several additional Commission decisions as key LCBF issues were vetted through the stakeholder process. For example, in D.04-07-029, the Commission defined the quantitative criteria in LCBF as curtailability, dispatchability, local reliability, and repowering.⁴ All other bid attributes, such as resource diversity, benefits to minority and low income communities, and

¹ The text of SB 1078 is available at: http://www.leginfo.ca.gov/pub/01-02/bill/sen/sb_1051-1100/sb_1078_bill_20020912_chaptered.html.

² *Order Initiating Implementation of the Senate Bill 1078 Renewable Portfolio Standard Program* (June 19, 2003, R.01-10-024)

³ *Order Initiating Implementation of the Senate Bill 1078 Renewable Portfolio Standard Program* at 30 (June 19, 2003, R.01-10-024)

⁴ *Opinion Adopting Criteria for the Selection of Least-Cost and Best-Fit Renewable Resources* at 28, FOF 27 (July 8, 2004, R.04-04-026)

environmental stewardship, were defined as qualitative.⁵ In D.05-12-042, the Commission adopted utility-specific Time-of-Delivery (TOD) factors that allowed utilities to differentiate bids' capacity and energy costs by time of day and year. In D.09-06-018, the Commission adopted project viability as part of the LCBF criteria.⁶ In D.11-04-030, the Commission denied a request by one utility to disallow energy-only bids.⁷

As the RPS program and renewables market matured, the Commission began to develop a more consistent framework to standardize certain aspects of the LCBF process and criteria across utilities. In D.12-11-016, the Commission adopted the Net Market Value (NMV) and Adjusted Net Market Value (ANMV) calculations, explicitly defining a core set of LCBF elements and basic analytical framework for aggregating those elements.⁸ In the decision, the Commission continued to allow utilities substantial flexibility in the implementation of the adopted calculations, including the ability to develop their own approaches to calculating the individual LCBF elements (except for transmission and integration costs); and the ability to incorporate additional elements. For example, the decision allowed PG&E to use what it calls Portfolio-Adjusted Value (PAV), which includes location, resource adequacy, and project output uncertainty.⁹

In the past several years, both the Commission and parties to the RPS proceeding have noted a need to revisit the least-cost and best-fit (LCBF) methodologies several times,

⁵ *Opinion Adopting Criteria for the Selection of Least-Cost and Best-Fit Renewable Resources* at 28, FOF 28 (July 8, 2004, R.04-04-026)

⁶ *Decision Conditionally Accepting 2009 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan Supplements* at 21 (June 8, 2009, R.08-08-09)

⁷ *Decision Conditionally Accepting 2011 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan Supplements* at 20 (April 20, 2011, R.08-08-009)

⁸ For an RPS bid, $NMV = (\text{energy value} + \text{capacity value}) - (\text{post-TOD adjusted PPA price} + \text{transmission network upgrade costs} + \text{congestion costs} + \text{integration costs})$. Adjusted $NMV = NMV + \text{ancillary services value}$.

⁹ *Decision Conditionally Accepting 2012 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan Off-Year Supplement* at 45 (November 14, 2012, R.11-05-005)

including in D.12-11-016,¹⁰ D.13-11-024,¹¹ and D.14-11-042.¹² More recently, in D.15-12-025, the Commission indicated that several specific issues related to the utilities' LCBF methodologies would be addressed in the LCBF reform activity scoped into the current RPS proceeding (R.15-02-020), including TOD factors, portfolio optimization, greenhouse gas emissions, and consistency with the RPS Calculator.¹³ The most recent amended scoping memo for the RPS proceeding explicitly includes "revising and updating the least-cost best-fit (LCBF) methodology for evaluating RPS-eligible procurement, including revisions mandated by SB 2 (1X) and SB 350."¹⁴

Consequently, staff have developed a set of proposed objectives (below) and a draft work plan for LCBF reform activity over the next year (see Table 1).

2. Objectives of LCBF Reform

The objectives of LCBF reform proposed by staff are as follows:

1. Ensure compliance with statutory requirements, particularly SB 2 (1X) and SB 350
2. Improve market efficiency by increasing transparency and consistency of LCBF methodologies used for bid evaluation across utilities and CPUC proceedings

¹⁰ *Decision Conditionally Accepting 2012 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan Off-Year Supplement* at 45 (November 14, 2012, R.11-05-005)

¹¹ *Decision Conditionally Accepting 2014 Renewables Portfolio Standard Procurement Plans and an Off-Year Supplement to 2013 Integrated Resource Plan* at 27 (November 24, 2014, R.11-05-005)

¹² *Decision Conditionally Accepting 2013 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan and On-Year Supplement* at 53 (November 20, 2013, R.11-05-005)

¹³ *Decision Accepting Draft 2015 Renewables Portfolio Standard Procurement Plans* at 93 (flat TOD factors), 100 (consistency with RPS Calculator), 101 (portfolio optimization), 102 (GHG), 103 (consistency with RPS Calculator), (December 17, 2015, R.15-02-020)

¹⁴ *Amended Scoping Memo and Ruling of Assigned Commission* at 3 (February 5, 2016, R.15-02-020)

3. Lay a foundation for interaction between RPS program and integrated resource planning (IRP)
 - a. Quantify the contributions of baseload resources
 - b. Explore benefits of quantifying GHG reduction
 - c. Contribute to the development of an appropriate framework for avoiding disproportionate rate impacts

The issues included in LCBF reform are based on the statutory requirements mandated by recent legislation (SB 2 (1X), SB 350); issues identified by parties in the 2015 RPS procurement plan process;¹⁵ and other emerging issues in renewable resource planning, procurement, and grid integration. The draft work plan separates the issues into three separate tracks.

A subset of Track 1 LCBF issues have been introduced in the 2016 RPS procurement plan process (workforce development, disadvantaged communities, and project viability). Exploration of another Track 1 LCBF issue, effective load carrying capability (ELCC), was initiated in October 2015 when a staff paper on the subject was entered into the record by ruling.¹⁶ A subsequent ruling and staff paper directed utilities to develop a proposal for a common ELCC methodology.¹⁷

This paper initiates exploration of the three remaining Track 1 LCBF issues: capacity price, TOD factors, and valuation of deliverability status (energy-only). For each issue, a brief description of the issue is presented below along with a request for specific types of information or comments on specific questions. In some cases, responses are only requested from utilities; in others, all parties may respond. For all information

¹⁵ *Decision Accepting Draft 2015 Renewables Portfolio Standard Procurement Plans* at 93 (flat TOD factors), 100 (consistency with RPS Calculator), 101 (portfolio optimization), 102 (GHG), 103 (consistency with RPS Calculator, (December 17, 2015, R.15-02-020)

¹⁶ *Ruling of the Assigned Administrative Law Judge Accepting into the Record Energy Division Staff Paper on the Use of Effective Load Carrying Capability for Renewables Portfolio Standard Procurement and Requesting Comment* (October 9, 2015, R.15-02-020)

¹⁷ *Administrative Law Judge's Ruling Accepting into the Record Revised Energy Division Staff Paper on the Use of Effective Load Carrying Capability for Renewables Portfolio Standard Procurement and Setting Schedule* (March 9, 2016, R.15-02-020)

provided, parties should explicitly include all assumptions and data sources used, including links. For any supporting calculations or work papers, parties should include Excel workbooks with live, working formulas rather than hard-coded values.

After reviewing party comments on this paper, as well as the utilities' previously provided common ELCC proposal and the capacity price proposal sought in Question 1, below, staff anticipate holding a public workshop later this year to further review four inter-related Track 1 LCBF issues with parties:

1. ELCC;
2. capacity price;
3. TOD factors; and
4. valuation of deliverability status.

Table 1. Draft Energy Division Staff Work Plan for LCBF Reform

Track	Activity	Issue	Quarter	Year
1	ALJ Ruling 1	ELCC (complete)	1	2016
	RPS Plans ACR	<ul style="list-style-type: none"> workforce development project viability 	2	
	ALJ Ruling 2	<ul style="list-style-type: none"> capacity price energy only TOD 		
	Workshop 1	<ul style="list-style-type: none"> ELCC capacity price energy only TOD 	3 or 4	
	Post-Workshop Ruling	topics from Workshop 1	3 or 4	
	RPS Plans Decision	topics from RPS Plans ACR	4	
	LCBF Decision 1	topics from ALJ Rulings 1-2	TBD	
2	ALJ Ruling 3	<ul style="list-style-type: none"> air quality and environment ancillary services consistency with RPS Calc 	3	2016
	Workshop 2	topics from ALJ Ruling 3	TBD	
	Post-Workshop Ruling	topics from ALJ Ruling 3	TBD	
3	ALJ Ruling 4	<ul style="list-style-type: none"> GHG disadvntgd communities integration adder optimal portfolio resource diversity 	1	2017
	Workshop 3	topics from ALJ ruling 4	TBD	
	LCBF Decision 2	topics from ALJ rulings 3-4	TBD	

3. Capacity Price

In utilities' LCBF methodologies, capacity value is assigned to each bid by multiplying the project's net qualifying capacity (NQC) with estimated capacity prices over the expected lifetime of the contract. A recent ruling and staff paper directed utilities to jointly develop a proposal for a standardized methodology and set of inputs and

assumptions for calculating NQC using an ELCC approach.¹⁸ Staff proposes that utilities extend that effort by addressing the second term of the capacity value calculation – the capacity price. To do so, staff requests that utilities undertake two additional activities to be completed in parallel with each other and with the development of an ELCC approach: 1) jointly develop a proposal for a public, standardized methodology and set of inputs and assumptions for estimating future capacity prices; 2) provide detailed, comprehensive work papers showing how each utility calculates future capacity prices for the purpose of evaluating RPS bids.

The specific questions that the two new activities should address are described below.

1. Utilities Only: Similar to the proposals being developed for a standardized ELCC methodology, utilities should develop a joint proposal for a standardized methodology and set of inputs and assumptions for estimating future capacity prices. The joint proposal should include
 - a. standardized inputs and assumptions;
 - b. draft capacity prices; and
 - c. a benchmarking report.

The joint proposal should include all the requested information listed under question 2. The benchmarking report should compare the draft capacity values with those in the RPS Calculator and any other useful public source of capacity values, along with an explanation of any major deviations. Energy Division staff will compare the public values developed by utilities with the individual utilities' own values to assess whether they are reasonably similar.

Utilities should contact Energy Division staff with any clarifying questions about the details of the information requested.

2. Utilities Only: What inputs, assumptions, methods, and tools do utilities currently use within their individual LCBF methodologies to develop capacity

¹⁸ *Administrative Law Judge's Ruling Accepting into the Record Revised Energy Division Staff Paper on the Use of Effective Load Carrying Capability for Renewables Portfolio Standard Procurement and Setting Schedule* (March 9, 2016, R.15-02-020)

prices to determine the capacity value of each bid? Include the following information:

- d. Assumptions and calculations for short and long term avoided cost, including derivation of forward capacity price curves for both system and local capacity; detailed description of any modeling tools used; and derivation of resource balance table. Include all demand and supply side assumptions.
- e. Pricing of all new capacity contracts executed since 2006, including both system and local capacity. Indicate the name of the generating resource, the technology type, the forecasted or actual commercial online date, the date of authorization, and the capacity price.
- f. Weighted average pricing for both system and local resource adequacy contracts entered in 2013, 2014, 2015, and 2016.

To establish a record on which to base potential future guidance on the capacity prices in utilities' LCBF methodologies, parties and utilities should also provide the information requested below.

3. All Parties: What are the benefits and risks to ratepayers and to RPS program outcomes of relying on public forward capacity price curves for assigning capacity value to bids in utilities' LCBF methodologies? What approaches could be used to maximize the benefits and minimize the risks?

4. Time of Delivery Factors

Time of Delivery (TOD) factors have been addressed in several previous Commission decisions on RPS procurement. In D.04-07-029, the Commission approved PG&E's use of TOD factors for determining the market value of a bid and directed Energy Division to further explore its potential to be used in procurement of RPS resources.¹⁹ The potential advantages of TOD factors cited by parties and noted by the Commission in that decision included: "a more accurate estimation of the value of capacity [...] and better fit with one of the utilities' proposed method of evaluating RPS bids." The

¹⁹ *Opinion Adopting Criteria for the Selection of Least-Cost and Best-Fit Renewable Resources* at 25, FOF 32, COL 9 (July 12, 2004, R.04-04-026)

decision also suggested that advantages of using TOD factors also included “precision and transparency.”

In D.05-12-042, the Commission adopted the IOU-specific TOD factors proposed by each IOU,²⁰ adopted a recommendation to approve utilities’ TOD factors during its review of utilities’ RPS procurement plans,²¹ and directed the utilities to develop a method for benchmarking and evaluating utilities’ TOD factors using publicly available data.²² In D.06-05-039, the Commission approved updated TOD factors²³ and reviewed the results of the benchmarking exercises performed by the utilities, but concluded that none of the benchmarking methodologies were appropriate for the Commission to adopt.²⁴ In this decision, the Commission indicated that “TOD factors should recognize the extent of the need for additional capacity.”²⁵

In D.09-06-018, the Commission declined to direct utilities to submit additional TOD benchmarking studies. In D.11-04-030, the Commission accepted SDG&E’s proposal to use TOD factors that include capacity costs.²⁶ In D.12-11-016, the Commission approved utilities’ updated TOD factors, including SCE’s separate values for resources

²⁰ *Interim Opinion Adopting Methodology for 2005 Market Price Referent* at 21, FOF 7-14 (December 19, 2005, R.04-04-026)

²¹ *Interim Opinion Adopting Methodology for 2005 Market Price Referent* at 22 (December 19, 2005, R.04-04-026)

²² *Interim Opinion Adopting Methodology for 2005 Market Price Referent* at COL 3 (December 19, 2005, R.04-04-026)

²³ *Opinion Conditionally Approving Procurement Plans for 2006 RPS Solicitation, Addressing TOD Benchmarking Methodology, and Closing Proceeding* at 67 (May 26, 2006, R.04-04-26).

²⁴ *Opinion Conditionally Approving Procurement Plans for 2006 RPS Solicitation, Addressing TOD Benchmarking Methodology, and Closing Proceeding* at COI 30 (May 26, 2006, R.04-04-26).

²⁵ *Opinion Conditionally Approving Procurement Plans for 2006 RPS Solicitation, Addressing TOD Benchmarking Methodology, and Closing Proceeding* at 69 (May 26, 2006, R.04-04-26).

²⁶ *Decision Conditionally Accepting 2011 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan Supplements* at 47 (April 20, 2011, R.08-08-009)

interconnecting with energy-only and full-capacity deliverability status.²⁷ While affirming utilities' right to develop its own values, the Commission also indicated in this decision that it was open to re-examining the methodologies used by utilities to derive the TOD factors.²⁸ Similarly, D.13-11-024 approved a new set of TOD factors, including four sets for SDG&E, and re-stated the Commission's willingness to examine TOD methodologies in the RPS proceeding.²⁹

In D.14-11-042, the Commission approved the updated TOD factors proposed by the utilities, including PG&E's proposal to differentiate TOD factors by deliverability status and SCE's reversion to a single set of TOD factors regardless of deliverability status, but declined to approve a uniform TOD factor of one proposed by SDG&E for use in contracting.³⁰ This decision also approved the proposal to grant utilities the authority to apply Commission-approved TOD factors to all RPS procurement programs. In granting SCE's request to revert to a single set of TOD factors, the Commission noted that SCE's experience with TOD factors differentiated by deliverability status appeared to distort the market signal associated with the value of deliverability status and also to disadvantage wind resources.³¹ In declining SDG&E's proposal for a flat TOD factor in contracts, the Commission noted that additional information was needed regarding the impact of such an approach.³²

²⁷ *Decision Conditionally Accepting 2012 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan Off-Year Supplement* at 36 (November 14, 2012, R.11-05-005)

²⁸ *Decision Conditionally Accepting 2012 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan Off-Year Supplement* at 38 (November 14, 2012, R.11-05-005)

²⁹ *Decision Conditionally Accepting 2013 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan and On-Year Supplement* at 34 (November 20, 2013, R.11-05-005)

³⁰ *Decision Conditionally Accepting 2014 Renewables Portfolio Standard Procurement Plans and an Off-Year Supplement to 2013 Integrated Resource Plan* at 23 (November 24, 2014, R.11-05-005)

³¹ *Decision Conditionally Accepting 2014 Renewables Portfolio Standard Procurement Plans and an Off-Year Supplement to 2013 Integrated Resource Plan* at 25 (November 24, 2014, R.11-05-005)

³² *Decision Conditionally Accepting 2014 Renewables Portfolio Standard Procurement Plans and an Off-Year Supplement to 2013 Integrated Resource Plan* at 26 (November 24, 2014, R.11-05-005)

Most recently, in D.15-12-025, the Commission approved the TOD factors proposed by PG&E and SCE, granted PG&E's request to revert to a single set of TOD factors regardless of deliverability status,³³ and again rejected SDG&E's request to use a flat TOD factor in contracting. The Commission decision also deferred consideration of this issue to when LCBF reform is considered in the RPS proceeding.

The Commission also recently instituted a new proceeding addressing time-of-use (TOU) periods.³⁴ Although related concepts, tools, and methodologies may be introduced and vetted in that proceeding, its focus in the near term is on the process for setting periods used for customer rates rather than the process for setting periods and factors relevant to resource procurement contracts.³⁵

Therefore, to establish a record on which to base potential future guidance on the use of TOD factors in the RPS program, and to ensure consistency with other potential related changes to utilities' LCBF methodologies, parties should address the questions below.

4. All Parties: TOD factors were initially approved by the Commission in part to provide an estimate of the capacity value of an offer in an RPS solicitation. Do TOD factors still serve this, or another useful function? Identify the specific RPS program goals that may be served by TOD factors and clearly articulate how TOD factors do or do not help achieve them. Explain how TOD factors may, or may not, overlap with other elements of utility LCBF methodologies, including capacity value calculations. 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.
5. All Parties: One function of TOD factors could be to provide a market signal to incent production at times that it has the greatest expected value to the grid.

³³ *Decision Accepting Draft 2015 Renewables Portfolio Standard Procurement Plans* at 92 (PG&E), 93 (SDG&E), Order 7 (SCE) (December 22, 2015, R.15-02-020).

³⁴ *Order Instituting Rulemaking to Assess Peak Electricity Usage Patterns and Consider Appropriate Time Periods for Future Time-of-Use Rates and Energy Resource Contract Payments* (December 28, 2015, R.15-12-012)

³⁵ *Scoping Memo and Ruling of Assigned Commissioner and Assigned Administrative Law Judge* at 11 (May 3, 2016, R.15-12-012)

How effective are TOD factors at incentivizing renewable energy resources to shift the timing of their production? Please provide quantitative estimates of how different TOD factors might affect the timing of energy production by different RPS-eligible resources. For each estimate provided, specify the resource type and ensure that that the effect is both physically plausible for that resource type and economically feasible given a reasonable estimate of the costs that enable the shift to occur (such as storage).

6. Utilities Only: One function of TOD factors used as the basis for payment could be to reduce RPS contract costs by attempting to align contract costs with expected wholesale market revenue at different times throughout the year in order to minimize net costs to ratepayers. How effective have TOD factors been historically at minimizing net costs? Utilities should provide quantitative documentation of how closely TOD factors in signed contracts have correlated with actual historical costs.

5. Valuation of Energy Only Deliverability Status in RPS Procurement

In D.11-040-030, the Commission declined to adopt a recommendation by SCE that the RPS program require projects to obtain full capacity deliverability status. Among its reasons for rejecting SCE's proposal, the Commission stated that "it is not clear that the cost to build additional facilities (e.g., transmission for deliverability) will be lower than costs related to curtailment."³⁶

In 2015, CAISO used RPS portfolios generated by Energy Division using the RPS Calculator to perform a study of the ability of its transmission system to absorb a portfolio of RPS resources with energy-only deliverability status.³⁷ CAISO's study

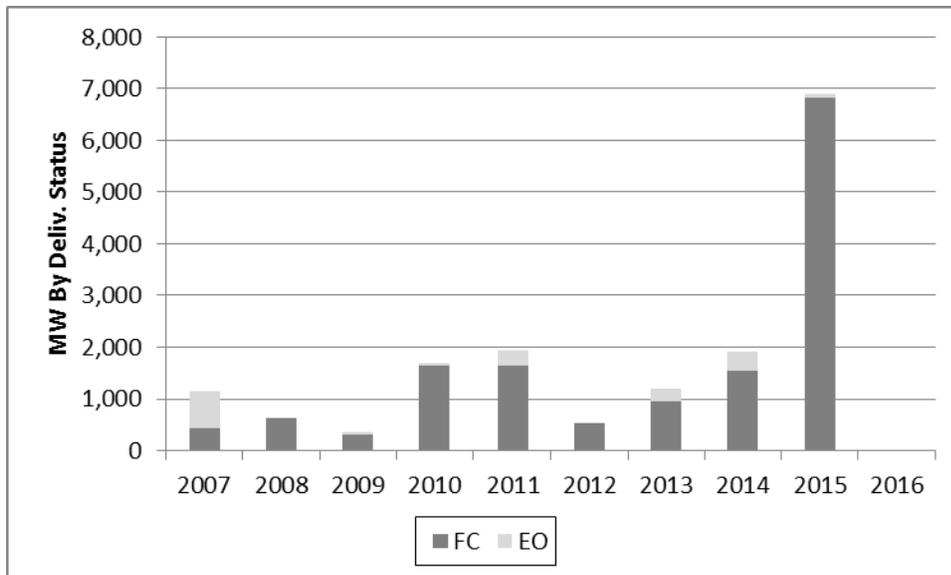
³⁶ *Decision Conditionally Accepting 2011 Renewables Portfolio Standard Procurement Plans and Integrated Resource Plan Supplements* at 20 (April 20, 2011, R.08-08-009)

³⁷ For background on the RPS Calculator and CAISO's study, see materials under "50% RPS Energy Only Special Study Teleconference (6/29/2015)" at http://www.cpuc.ca.gov/RPS_Calculator and *Administrative Law Judge's Ruling Accepting into the Record Energy Division Staff Paper on Draft 2016 RPS Portfolios for Generation and Transmission Planning and Requesting Comments*, Attachment A at 3 (March 14, 2016, R.15-02-020), available at <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=10351>. For detailed results of

Footnote continued on next page

indicated that the CAISO system has the potential to absorb over 20,000 MW of renewable resources with energy-only deliverability status. Although the theoretical ability of the CAISO transmission system to accommodate new energy-only resources appears large, and energy-only projects have the potential to reduce transmission-related costs associated with achieving future RPS compliance goals, historically the proportion of projects requesting interconnection as energy-only projects has been very small (see Figure 1). Moreover, no IOUs have PPAs approved through the Commission’s RPS program with energy-only resources.

Figure 1. MW of Solar, Wind, and Geothermal Projects in CAISO Interconnection Queue 2007-2016 (by year of request and deliverability status)



Source: CAISO Interconnection Queue, 4/22/16. Latest report available at: <https://www.caiso.com/planning/Pages/GeneratorInterconnection/Default.aspx>

The potential cost benefits of increasing the proportion of projects with energy-only status that are used to comply with RPS program targets has prompted Energy Division to initiate a closer examination the treatment of deliverability status in the RPS procurement process. To establish a record on which to base potential future guidance

CAISO’s study, see its *2015-2016 Transmission Plan* at 205 (<https://www.caiso.com/Documents/Board-Approved2015-2016TransmissionPlan.pdf>)

on the valuation of energy-only projects in utilities' LCBF methodologies, parties and utilities should provide the information described below.

Questions for All Parties:

7. How would an increase in energy-only projects affect financial, reliability, or RPS-compliance related risks, including risks to existing, online projects? Do the risks differ for projects at different stages in the development cycle (e.g., online projects, projects under development, future projects)? Describe each identified risk and how an increase in energy-only projects would increase or decrease that risk.
8. Are there any actions, such as changes to policies or business practices, that the Commission, utilities, or entities (such as the California Independent System Operator) could take to facilitate the development of energy-only projects or mitigate the financial, reliability, or RPS-compliance risks posed by energy-only projects? Please describe any suggested action in detail and explain how it will facilitate the development of energy-only projects or mitigate risks associated with an increase in energy-only projects.
9. Do utilities' most recent LCBF methodologies accurately weight the likely costs and benefits to ratepayers of energy-only projects relative to full capacity deliverability projects? If any of the utilities' LCBF methodologies do not accurately weight the likely costs and benefits of energy-only projects, please identify the methodology, describe the problem, and how the methodology should be changed to improve the problem.
10. What are the most significant barriers to developing renewable energy projects with energy-only deliverability status and winning bids in the RPS program?
11. What information would be likely to improve a renewable energy project development team's ability to confidently determine whether the value of FCDS status is worth the cost of obtaining it? What types of analysis or studies would be needed to generate the required information? Describe the types of analysis, including any modeling tools, data inputs, and assumptions, that would be helpful.
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 energy-only resources could lead to a decline in system-wide resource adequacy?

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?
14. What changes, if any, to resource adequacy accounting would best support an economically optimal level of energy-only project procurement? (Note that some issues relevant to the consideration of energy-only projects in LCBF reform are also relevant to the Commission's resource adequacy (RA) proceeding. Parties' views on this question will be useful in considering LCBF reform, but are not part of the record of the RA proceeding.)

Question for Utilities:

Utilities should provide a written description of how the deliverability status of a bid impacts its least-cost and best-fit ranking. Identify each least-cost best-fit criterion that could be affected by deliverability status, including both quantitative and qualitative elements. For criteria that are affected by deliverability status, explain the directional impact of each type of deliverability status on a bid's ranking (energy only, fully deliverable, partially deliverable). Describe all plausible potential interactions among criteria could influence the directional impact of deliverability status on project ranking. Include answers to the following questions:

15. In the context of evaluating bids, does full capacity deliverability status serve as a useful indicator or proxy for specific benefits or other attributes of a renewable energy resource? For example, does full capacity deliverability status suggest that a project is less likely to contribute to local congestion? Please describe which benefits or attributes full capacity deliverability serves as an indicator for, and why.
16. What conditions or circumstances that might lead the IOU to place more qualitative or quantitative value on a particular deliverability status?
17. How are congestion costs in different areas determined? List all inputs and assumptions used to calculate congestion costs. Provide work papers documenting the approach used to calculate congestion costs.

18. Is there any information currently unavailable to utilities that would improve utilities' ability to evaluate the impact of a project's deliverability status on its net market value? Describe what information would be helpful, how it would help, and, if known, how it could be obtained.

(END OF ATTACHMENT A)