

**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 18-07-003
(Filed July 12, 2018)

**REPLY COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM
OPERATOR CORPORATION**

Roger E. Collanton
General Counsel
Anthony J. Ivancovich
Deputy General Counsel
Anna A. McKenna
Assistant General Counsel
Jordan Pinjuv
Senior Counsel
California Independent System
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 351-4429
Fax: (916) 608-7222
Email: jpinjuv@caiso.com

Attorneys for the California Independent
System Operator Corporation

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I. Introduction

Pursuant to the Administrative Law Judge’s Ruling Requesting Comments on Staff Proposal on Effective Load Carrying Capability, Time of Delivery Factors, and Project Viability, dated September 12, 2018 (September 12 Ruling), the California Independent System Operator Corporation (CAISO) hereby submits its reply to opening comments submitted on the September 12 Ruling and attached Staff Proposal. The CAISO provides responses to specific questions listed in the Staff Proposal regarding the effective load carrying capability (ELCC) for the renewable portfolio standard (RPS).

II. Discussion

A. The Commission Should Use Consistent ELCC Methodologies in its Planning and Procurement Activities.

The CAISO strongly supports party comments urging the Commission to use consistent methodologies in its procurement and planning proceedings and is encouraged that this RPS proceeding is seeking to coordinate with the integrated resource plan (IRP) proceeding.¹ However, the CAISO has significant concerns with the ELCC methodology used in the IRP proceeding and notes that related ELCC discussions in the resource adequacy proceeding appear to be uncoordinated with this proceeding. Though the Commission has not decided on a specific ELCC methodology in the resource adequacy proceeding, the IRP proceeding seems to presuppose the outcome by using Energy Division staff’s proposed ELCC approach as the foundation for the Reference System Plan and potentially for the forthcoming Preferred System

¹ See opening comments of Large Scale Solar Association (LSA), Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E), as examples.

Plan. The CAISO believes significant corrections should be made to the IRP loss of load expectation (LOLE) and ELCC methodologies and then appropriately adopted into this RPS proceeding.

The September 12 Ruling cites Energy Division staff's IRP LOLE analysis, which itself leans heavily on work previously conducted in the Commission's resource adequacy proceeding.² The Commission has not yet adopted an ELCC methodology in the resource adequacy proceeding. The Commission has adopted ELCC values for resource adequacy purposes, but it did not adopt a specific methodology, but rather interim ELCC values as a transitional measure.³ Until an ELCC methodology is adopted in the resource adequacy proceeding, any resulting ELCC values in the RPS proceeding would inappropriately and prematurely presuppose the outcome of the ongoing ELCC discussion in the resource adequacy proceeding.

The CAISO also requests the Commission clarify its reference to the IRP's use of marginal ELCC calculations. Specifically, the September 12 Ruling notes that "D.18-02-018 direct[s] Energy Division staff to conduct a marginal ELCC study through a production cost modeling process when reviewing Load Serving Entity (LSE) IRP portfolios as part of the Preferred System Plan."⁴ However, the most recent ruling in the IRP proceeding notes that the methodology for each month is to "calculate the average portfolio ELCC of wind and utility solar"⁵ and "that the production cost modeling exercises above do not include any marginal ELCC studies."⁶

B. CAISO Responses to Specific Questions Regarding ELCC Methodology.

In the sections below, the CAISO reproduces selected questions posed in section 4 of Attachment A to the September 12 Ruling and provides related responsive comments.

Question 1. Provide comments on Staff's proposal and explain why you do or do not agree with the proposal.

The CAISO agrees with SDG&E that the Commission should use an annual LOLE,

² Email from Administrative Law Judge Peter Allen, "RE: R.17-09-020 RA – ELCC," on September 28, 2018 requesting party feedback on whether a workshop is needed to discuss the forthcoming Energy Division proposal on ELCC.

³ Decision 17-06-027, June 29, 2017, p. 20.

⁴ September 12 Ruling, p. 11.

⁵ IRP Ruling, p. A-11 to A-12.

⁶ IRP Ruling, p. A-10.

rather than a monthly figure, to derive ELCC values.⁷ As the CAISO has explained in comments submitted in the integrated resource plan (IRP) proceeding, Energy Division staff's methodology for calculating LOLE decreases the system reliability target from a 1-day-in-10 years loss of load expectation (*i.e.*, 0.1 LOLE) to a 3 days-in-10 years LOLE (*i.e.*, 0.3 LOLE) based on flawed reasoning. As such, the resulting ELCC values should not be used in procurement or this RPS proceeding.

In the IRP proceeding, Administrative Law Judge Fitch issued a Ruling Seeking Comments on Production Cost Modeling on September 24, 2018 (IRP Ruling). In a footnote, the IRP Ruling described its monthly LOLE methodology as follows:

Specifically, the monthly LOLE target was created by first taking the industry standard 0.1 LOLE annual target and assuming that most of those events map to the four peak months of June through September, or one third of the year. *Assuming a similar target reliability for the rest of the year would mean that total LOLE over the entire year should have a target of $0.1 \times 3 = 0.3$ [emphasis added].* Thus, monthly LOLE studies would have a monthly target LOLE of $0.3/12 = 0.025$, *i.e.* a target range of 0.02 to 0.03.⁸

Using such criteria to determine the ELCC and resource adequacy procurement, the system would be expected to have 3 days of loss of load in 10 years. The CAISO opposes decreasing the widely accepted 1 day-in-10 years industry LOLE target.⁹ There has been no analysis presented to support a 3 days-in-10 years LOLE.

Energy Division staff argues that the 1 day-in-10 years LOLE target may no longer be appropriate because “[t]oday’s computers perform simulations, not simple calculations, and perform simulations of each hour of the year thousands of times with multiple stochastic variables” whereas in the past, planners could only focus on weekday peak hours because they lacked sufficient computing power.¹⁰ This is not a proper logical conclusion. The North American Reliability Corporation (NERC) explains the methodological focus on peak hours as follows:

The general principle is to start with a full year (or more) of data and calculate

⁷ See SDG&E opening comments, p. 2.

⁸ *Id.*, p. A-7.

⁹ <https://www.nerc.com/files/IVGTF1-2.pdf>, p. 9.

¹⁰ California Public Utilities Commission Energy Division, “Proposal for Monthly Loss of Load and Solar and Wind Effective Load Carrying Capability Values for 2018 Resource Adequacy Compliance Year,” February 24, 2017, p. 6.

LOLE for each time period. During off-peak periods and times when there is excess generating capacity available, LOLE values will usually be zero. Non-zero LOLE values occur during peak periods and near-peak periods, and possibly during times that large amounts of capacity are undergoing scheduled maintenance and is therefore unable to provide capacity.¹¹

In other words, the eight off-peak months, as defined in the IRP Ruling, should have no contribution to LOLE (0.0 LOLE), to produce a 0.1 LOLE over the entire study year. Energy Division staff implies that the LOLE risk in the non-peak months existed prior to the advent of newer computing technologies, but in prior studies this risk was ignored. Based on this assumption, Energy Division staff erroneously calculated a “monthly LOLE target by taking the 0.1 LOLE target over the four peak months of June through September (equal to one third) of the year and spreading that level of LOLE across the year (translating to three times that level over the year).”¹² This leads to a lower overall 3 days-in-10 years reliability target, which is neither appropriate nor prudent as a utility practice. It is critical to note that the industry developed the 1 day-in-10 years target based on legacy power systems that were dominated by conventional resources with high availability factors.¹³ Any change in the LOLE target must consider variable energy resource integration needs, energy limited resources, the impact of conventional generation retirements, and conventional generation outage patterns.¹⁴

Energy Division staff’s methodology is also inconsistent as it attempts to apply a day or event-based reliability metric to an hourly model.¹⁵ The “day” in the LOLE metric is not equivalent to 24 hours. In fact, the reliability metric assumes that the loss of only one peak load hour is equivalent to a single day of lost load. Energy Division staff’s current methodology ignores the fact that the system and economic impacts of multiple hours of loss of load in the same day are much more severe than a single hour. Much more analysis and discussion is needed to consider how to align a day or event-based metric with hourly modeling.

¹¹ <https://www.nerc.com/files/IVGTF1-2.pdf>, p. 10.

¹² California Public Utilities Commission Energy Division, “Proposal for Monthly Loss of Load and Solar and Wind Effective Load Carrying Capability Values for 2018 Resource Adequacy Compliance Year,” February 24, 2017, p. 7.

¹³ <https://www.nerc.com/files/IVGTF1-2.pdf>, p. 9.

¹⁴ <https://www.nerc.com/files/IVGTF1-2.pdf> and http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2018-10-09/09242018%20Capacity%20Value%20of%20Resources%20with%20Energy%20Limitations.pdf.

¹⁵ There have been studies conducted about the conversion of LOLE targets using only peak load to LOLE targets using hourly load. See R. Billinton, R. N. Allan, *Reliability Evaluation of Power Systems*, Plenum Press, New York and London (second edition, 1996).

Energy Division staff's IRP ELCC analysis should be considered preliminary and subject to further methodology refinements and coordination in the resource adequacy proceeding. Energy Division staff's conclusion in the IRP production cost modeling that significant amounts of storage may increase the ELCC of wind and solar are speculative, especially given staff's caveats. For example, Energy Division staff notes the ELCC analysis presented in the IRP proceeding "does not represent an adequate reliability assessment, as [Commission] staff did not explicitly evaluate sub-hourly flexibility (ramping) needs nor Local Resource Adequacy (RA) needs."¹⁶ The CAISO agrees and emphasizes that the system ELCC values derived from Energy Division staff's analysis are portfolio-dependent and that the IRP resource portfolio includes the entire existing thermal generation fleet net of announced retirements.

In addition, Energy Division staff's observed increases in wind and solar ELCC values with the addition of storage assume that the solar and storage resources work in tandem to lower LOLE. However, storage resources procured in local capacity areas may be reserved for contingency use and, therefore, will not be optimized with solar or wind at the system level. Furthermore, ELCC values will not be equivalent in each local area because each area has unique load shape and resource portfolio. As currently modeled, the IRP approach reduces reliability while overestimating ELCC values.

Question 2. The IRP Staff Proposal on Production Cost Modeling (September 2017) and D.18-02-018 direct Energy Division staff to conduct a marginal ELCC study through a production cost modeling process when reviewing Load Serving Entity (LSE) IRP portfolios as part of the Preferred System Plan.²² It is proposed herein that the IOUs perform an updated marginal ELCC study in 2018 for use in future RPS procurement. If the ELCC for RPS procurement proposal is adopted, should the marginal ELCC study used for IRP Preferred System Plan also be used in RPS procurement? If so, in what capacity should the IRP study be used in relation to RPS procurement? Should the ELCC study performed by IRP staff be used as the primary marginal ELCC study in the future? Provide a justification for your response.

For the reasons provided in response to question 1 above, the CAISO does not support using the outputs of the IRP proceeding ELCC values for RPS.

Question 6. At the January 18, 2018 workshop, parties discussed the potential differences between a monthly vs. annual ELCC on RPS bid ranking results. The Commission requests that the IOUs investigate the sensitivity of RPS bids' NMVs to changes in the ELCC study through utilizing two ranking systems: one using only

¹⁶ IRP Ruling, Attachment B, p. 64.

annual marginal ELCC values and one using monthly marginal ELCC values, and provide the results in comments. The IOUs may use representative bid data obtained through a prior solicitation. *In their response, the IOUs should include work papers showing their calculations.*

CAISO supports annual ELCC values per the response provided to question 1 above.

III. Conclusion

The CAISO strongly recommends that the Commission coordinate its LOLE and ELCC methodologies across its many planning and procurement proceedings. Failure to properly coordinate could lead to ineffective procurement and potential reliability issues in the future. The CAISO looks forward to collaborating with the Commission to develop an effective ELCC framework.

Respectfully submitted,

By: /s/ Jordan Pinjuv

Roger E. Collanton
General Counsel
Anthony J. Ivancovich
Deputy General Counsel
Anna A. McKenna
Assistant General Counsel
Jordan Pinjuv
Senior Counsel
California Independent System
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 351-4429
Fax: (916) 608-7222
Email: jpinjuv@caiso.com

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