BEFORE THE ENERGY COMMISSION
OF THE STATE OF CALIFORNIA

Energy Reliability	21-IEPR-04

I. Introduction

The California Independent System Operator (CAISO) submits comments on the December 3, 2021 *Integrated Energy Policy Report (IEPR) Commissioner Workshop on Supply-Side Demand Response: Reliability and Resource Planning, Market Opportunity, and Issues*.

The CAISO appreciates the California Energy Commission's (Commission) hard work and thoughtfulness in leading the demand response qualifying capacity working group[1] and the opportunity to participate in the IEPR workshop and provide comments.

The CAISO continues to support Effective Load Carrying Capability (ELCC) as the preferred resource adequacy counting methodology for demand response resources with limited availability or output. ELCC best captures demand response resource reliability contributions and interactive effects with other resources on the system. The CAISO has worked with Pacific Gas & Electric Corporation (PG&E) to propose a variation of ELCC called the "Load Impact Protocol (LIP) Profile Informed ELCC." The CAISO supports this approach as the preferred counting methodology for demand response resources for resource adequacy year 2023. Importantly, this approach meets the CAISO's principles to support an exemption from the CAISO's resource adequacy availability incentive mechanism (RAAIM). In contrast, counting methodologies that measure demand response resources' capability without also examining their contribution to reliability would not qualify for RAAIM exemption. Finally, the CAISO believes the "heat map" approach discussed in the workshop is based on flawed assumptions and the Commission should not adopt it.

[1] Docket 21-DR-01 "Supply Side Demand Response."

II. Background

Demand response is, and will continue to be, an important resource for ensuring reliability in an increasingly decarbonized grid. Over the years, the CAISO has made several enhancements to integrate demand response resources into its market and allow them to provide energy and ancillary services. To operate the grid reliably, the CAISO must be able to rely on the capacity shown by load serving entities and suppliers in annual and monthly resource adequacy plans, including demand response resources.

Capacity valuation is a critical piece of the resource adequacy program, which was created to ensure the safe and reliable operation of the grid in real-time by providing sufficient resources to the CAISO when and where needed.[2] A key purpose of the resource adequacy program is to ensure there is sufficient capacity and reserves for the CAISO to balance supply and demand across the grid. Any resource providing resource adequacy capacity to the CAISO has an obligation to offer that capacity into the CAISO market so that the CAISO can manage and dispatch the system reliably. Resource qualifying capacity values shown to the CAISO via resource adequacy supply plans inform the CAISO of capacity it can expect to rely upon to meet its operational and reliability needs.

The resource adequacy program was originally designed to meet the peak load of each month plus a planning reserve margin. However, the proliferation of intermittent and use-limited resources has required capacity counting methodologies to evolve to better capture the reliability contribution of certain resources. For example, the California Public Utilities Commission (CPUC) updated its resource adequacy capacity valuation methodologies for wind and solar to use an effective load carrying capability (ELCC) approach.[3] Resource adequacy counting methodologies for hydro resources have also evolved over time to reflect potential drought conditions.[4] The CPUC's integrated resource planning (IRP) process also applies ELCC to four-hour duration storage resources. Furthermore, the CAISO has proposed enhanced counting methodologies to reflect unit-

[2] https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/resource-adequacy-homepage.
[3] Decision Adopting Local and Flexible Capacity Obligations for 2018 and Refining the Resource Adequacy Program (D.17-06-027), June 29, 2017, p. 19.
[4] Decision Adopting Local Capacity Obligations for 2021-2023, Adopting Flexible Capacity Obligations for 2021, and Refining the Resource Adequacy Program (D.20-06-031), June 25, 2020, p. 22.

specific forced outages.[5] These efforts help ensure that the actual reliability contribution of different resources are considered in resource planning and procurement processes, and are ultimately reflected in the resource adequacy fleet shown to the CAISO. Although counting methodologies for many resource types have evolved over time, demand response counting has not evolved to reflect changing grid realities.

The CAISO continues to advocate for improvements in calculating demand response qualifying capacity in the resource adequacy program. In particular, the CAISO believes an enhanced counting methodology for demand response should:

1. Represent accepted industry-leading practices recognizing demand response resources' limited and variable output nature;
2. Assess demand response resources' contribution to reliability across the year or seasons; and
3. Assess demand response resources' interactive effects with other resources as incremental amounts of energy and use-limited resources begin to add less and less incremental capacity value to the system.

The ELCC methodology best meets these objectives. The ELCC methodology meets the first principle as it is not a new approach in the resource adequacy program or in the industry. The CPUC has effectively used it since the 2018 resource adequacy compliance year pursuant to Public Utilities Code Section 399.26(d).[6] ELCC has gained traction across the United States, and several independent system operators, regional transmission organizations, and utilities already use, or are considering a transition to, ELCC for renewable energy and energy limited resources.[7]

Consistent with the second principle, planning assumptions must recognize that demand response resources are availability-limited, use-limited, and have variable output. Availability-limited means the resource is not available 24 hours a day. Use-limited means the resource is subject to limited calls or run hours over a period of time. Variability means

[5] Draft Final Proposal – Phase 1 and Sixth Revised Straw Proposal, December 17, 2020, p. 73. Available at: http://www.caiso.com/InitiativeDocuments/DraftFinalProposal-SixthRevisedStrawProposalResourceAdequacyEnhancements.pdf.
[6] CPUC Decision (D.)17-06-027.
[7] CAISO uses ELCC for wind and solar. MISO uses ELCC for wind. PJM recently adopted ELCC methodologies for wind, solar, storage and other resource types with limited energy or availability. SPP and NWPP are actively exploring use of ELCC methodologies.

that the potential load reduction available from demand response resources may fluctuate across the day based on load patterns. Any approved qualifying capacity valuation methodology must appropriately consider the limited availability and variable nature of demand response and how these operating limitations impact system reliability at different times of the day and year.

Regarding the third principle, planning assumptions must recognize the proliferation of variable and use-limited resources on the grid. In 2020, half of the resource adequacy capacity in CAISO's market was classified as use-limited. This "saturation" of resources with limited output can result in incremental amounts of similar resource types (*i.e.*, resources with similar hours of operation and characteristics) adding less incremental capacity value to the system. For example, the CAISO could not reliably operate the grid if the resource adequacy fleet was solely comprised of resources available only from 4-9 pm. Resources with limited availability, including demand response, do not operate in isolation, and capacity values should reflect the interactive effects with other resources on the system.

III. Discussion

A. The CAISO supports a "Load Impact Protocol (LIP) Profile Informed ELCC" as the preferred resource adequacy counting methodology for resource adequacy compliance year 2023 for demand response resources with limited availability or output.

The CAISO continues to support ELCC as the preferred resource adequacy counting methodology for demand response resources with limited availability or output. This approach best captures demand response resource reliability contributions and interactive effects with other resources on the system. The CAISO has worked with Pacific Gas & Electric Corporation (PG&E) to propose a variation of ELCC called the "Load Impact Protocol (LIP) Profile Informed ELCC" to reflect the variable, use-limited, and availability-limited nature of demand response.

The LIP process evaluates the load reduction capability of demand response resources. However, capability is not the same as a qualifying capacity value. The load drop that demand response can produce (*i.e.*, capability) is not always equivalent to the reliability benefit the resource provides to the grid. For this reason, the CAISO proposes assessing the reliability impact of demand response's capabilities using a loss of load

expectation to calculate the ELCC of demand response. While an ELCC study typically uses nameplate capacity, the Load Impact Protocol (LIP) Profile Informed ELCC would use resource availability (LIP profiles) as a proxy for the nameplate of demand response.

The CAISO has developed a process guide to facilitate the CPUC Energy Division Staff's calculation of demand response's ELCC.[8] This effort will leverage the CPUC's existing modeling tool, which it currently uses to develop ELCC values for the resource adequacy program and in its IRP proceeding.[9] The CAISO is hopeful the LIP Profile Informed ELCC can be used to establish demand response qualifying capacity for the 2023 resource adequacy year and then be refined further to inform program design in time for the investor owned utility (IOU) 2023-2027 program applications.

The LIP Profile Informed ELCC approach would also allow demand response providers, including IOUs and third party (*i.e.*, non-IOU) providers, to leverage the existing CPUC LIP process. Beyond a demand response provider's existing LIP report, demand response providers (or their consultants) would prepare LIP profiles for the programs they offer.

The LIP Profile Informed ELCC approach would not preclude third party (*i.e.*, non-IOU) demand response providers from using the LIP process. Today, third parties use the LIP process to facilitate bilateral contracting with load-serving entities under CPUC jurisdiction. The LIP Profile Informed ELCC approach could be an option for both IOU and non-IOU third party demand response providers for resource adequacy year 2023. Using the LIP Profile Informed ELCC approach for resource adequacy year 2023 would allow parties to understand better its potential for long term use and provide insights into potential refinements.

[8] DR ELCC Guide - Using LIP-informed Profiles to Calculate DR ELCC in SERVM, December 8, 2021, Available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=240947&DocumentContentId=74800

[9] This tool is the Strategic Energy & Risk Valuation Model (SERVM).

B. The "Load Impact Protocol (LIP) Profile Informed ELCC" methodology would meet the CAISO's principles to qualify for a RAAIM exemption.

A qualifying capacity methodology that recognizes demand response's variable and use-limited nature also meets CAISO's principles to qualify for a RAAIM exemption. The CAISO identified the following principles for establishing qualifying capacity within its Variable Output Demand Response policy[10] which, if met, would qualify resources for a RAAIM exemption:

1. Assesses the resource's contribution to reliability across all hours of the year or seasons as a variable-output resource; and
2. Assesses the resource's interactive effects with other similarly-situated resources.

The LIP Profile Informed ELCC methodology meets the CAISO's principles to qualify for a RAAIM exemption.

C. Proposals that do not capture the variable nature of demand response and contributions to reliability do not meet CAISO's principles for qualifying for a RAAIM exemption.

Proposals that merely measure resource capability, but not the resource's contribution to reliability, miss the reflection of demand response as a variable output resource, its use limitations, and the interactive effects with other use-limited resources. Both the California Efficiency + Demand Management Council (CEDMC) proposal and the resource adequacy program's current LIP-based qualifying capacity methodology fall short in this respect. These proposals estimate resource capability but do not reflect resources' contribution to reliability. Neither of these options consider the use-limitations, limited-energy, or variable nature of most demand response in establishing qualifying capacity values. They also fail to account for reliability impacts when there is a saturation of use-limited resources on the system. As a result, these approaches do not accurately assess demand response resources' contribution to reliability.

[10] Decision on RAAIM Exemption Option for Variable-Output Demand Response, July 7, 2021, Available at: http://www.caiso.com/Documents/Decision-RAAIM-Exemption-Option-Variable-Demand-Response-Resources-Memo-July-2021.pdf.

D. The "heat map" qualifying capacity approach does not meet CAISO's principles for qualifying for a RAAIM exemption. Furthermore, the proposed "heat map" approach relies on an illustrative example and would not accurately value demand response contribution to reliability.

The "heat map" approach discussed by PG&E [11] would not meet the CAISO's principles for qualifying for a RAAIM exemption. The "heat map" approach amounts to an administrative de-rate based on an example. The ELCC heat map created by Energy and Environmental Economics, Inc. (E3) is an illustrative example only and is not rooted in actual demand response program data.[12] Additionally, the E3 heat map does not account for the variable output of demand response as the de-rates reflected in the heat map are relative to a "perfect" demand response resource with 24 x 7 availability and perfect response when called upon. In actuality, many demand response resources have variable output and provide limited energy. The intent of the heat map was to illustrate the impact of constraints on capacity values (the maximum number of calls per year and the maximum duration of each of those calls) as well as to show: (1) the impact between first-in and last-in ELCC values, and (2) the saturation effect as more use-limited and availability-limited resources come online in later years. The heat maps also provided examples of how a demand response resource's ELCC could be increased by more calls and increased duration. Ultimately, however, these heat maps do not reflect actual demand response program data and do not adequately capture the variable nature of demand response. Therefore, the heat map approach would not count for RAAIM exemption under CAISO's principles.

The E3 heat map does not represent a true ELCC study and would not accurately reflect the reliability contribution of demand response. To create a heat map based on actual demand response program data would require running an ELCC study to calculate actual ELCC values. Since a refreshed ELCC study is necessary as a basis for the heat map approach, the CAISO believes using the actual ELCC study to determine ELCC values for demand response represents a superior approach to calculating average ELCC performance in the heat map approach.

[11] The IOUs withdrew this proposal at the December 13, 2021 CEC working group meeting.
[12] *See* slide 34 of http://www.caiso.com/Documents/Presentation-ELCCStudyResults-DemandResponseResources-Jun24-2021.pdf.

IV. Conclusion

The CAISO supports a Load Impact Protocol (LIP) Profile Informed ELCC as the preferred resource adequacy counting methodology for demand response resources with limited availability or output, for resource adequacy year 2023. Importantly, this approach meets the CAISO's principles to qualify for RAAIM exemption. In contrast, counting methodologies that measure resource capability rather than capturing contribution to reliability should not qualify for RAAIM exemptions under the CAISO's principles. Finally, the proposed "heat map" approach is based on flawed assumptions and the Commission should not adopt it.

Respectfully submitted,

By: *<u>/s/ Jordan Pinjuv</u>*
Roger E. Collanton
General Counsel
Anthony Ivancovich
Deputy General Counsel
Jordan Pinjuv
Senior Counsel
California Independent System Operator Corporation
250 Outcropping Way
Folsom California 95630
Tel.: (916) 351-4429
jpinjuv@caiso.com

Date: December 17, 2021