Stakeholder Comments Template

Energy Storage and Distributed Energy Resources (ESDER) Phase 4

This template has been created for submission of stakeholder comments on the Straw Proposal for ESDER Phase 4. The paper, stakeholder meeting presentation, and all information related to this initiative is located on the initiative webpage.

Upon completion of this template, please submit it to initiativecomments@caiso.com. Submissions are requested by close of business **May 17, 2019**.

Submitted by	Organization	Date Submitted
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Please provide your organization's general comments on the following issues and answers to specific requests.

1. **Non-Generator Resource (NGR) model SOC parameter**

2. **Bidding requirements for energy storage resources**

3. **DR operational characteristics**

    a. Please provide comments on the CAISO's three options.

4. **Variable output DR**

    a. CAISO requests additional detail and reasoning from stakeholders who believe a more appropriate method exists for determining QC than applying an ELCC methodology.

    CLECA does not support application of an Effective Load Carrying Capability (ELCC) methodology to determine the qualifying capacity (QC) of demand response. To answer this question fully, we begin by reviewing the

CPUC's Resource Adequacy (RA) program.[1] We then consider how resources are counted under the CPUC's RA program. The RA program is focused on showing a sufficient amount of resources to meet the peak load during each month based upon a 1 in 2 weather-adjusted forecast.[2] Each load serving entity (LSE) must show that it has sufficient resources to meet its forecasted peak plus a planning reserve margin for each month.[3]

The CPUC has adopted a manual on how each type of resource's QC is determined for use in the RA program.[4] For dispatchable generation, except wind and solar, the QC is based on the maximum power plant output in response to tests performed by the CAISO. For non-dispatchable hydro and geothermal resources, the QC is based on a three-year average of historical production data. The QC for cogeneration and biomass is based on historical scheduling and bidding data. For demand response resources, except those procured from the Demand Response Auction Mechanism (DRAM), the QC is based on the Commission-approved Load Impact Protocols (LIPs).[5]

With the exception of dispatchable generation, the CPUC requires examining historical data performance during the hours of 4 - 9 pm for each month.[6] This is also when the peak, or the net-load peak, is most likely to occur.[7] The approach for wind and solar is very different, which will be discussed in more detail later.

Therefore, the RA program forecasts a peak for each month, which will typically occur in the hours of 4 - 9 pm. LSEs must show they have sufficient capacity that is available from 4 - 9 pm to meet the monthly peak plus a planning reserve margin. The RA program thus recognizes that,

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[1] For more information see https://www.cpuc.ca.gov/ra/
[2] For simplicity, the discussion will look at system only and ignore local or flexibility requirements.
[3] The planning reserve margin takes into account load variation, operating reserves, and unit forced outages.
[4] CPUC, Qualifying Capacity Methodology Manual Adopted 2017, page 7.
[5] Since DRAM is a pilot, it is using contract capacity for the qualifying capacity. The CPUC's RA proceeding is reviewing how the QC of resources under DRAM should be counted.
[6] CPUC, 2019 Filing Guide for System, Local and Flexible Resource Adequacy (RA) Compliance Filings
[7] The Net Peak = Peak Load – Wind – Solar. With ample supply of solar, there has been more concern about have sufficient generation to me the net load peak which occurs in the evening hours until 9 pm.

while the load forecast is for the top hour in the month, it is unknown when that hour will occur. Accordingly, the qualifying capacity methodologies, with the exception of wind and solar, focus on their ability to provide capacity during the availability assessment hours of 4 - 9 pm.

For wind and solar resources, California law requires the use of the ELCC methodology to determine the QC for the CPUC RA program.[8] The calculation of ELCC is very different than the other methods to calculate QC. The determination of ELCC is a complex approach that requires the use of computer models that utilize stochastics to take into account a distribution of possible outcomes. For example, the modeling would analyze various load forecasts, unit forced outage rates, and wind and solar output shapes. The stochastic model is then used to determine when loss of load expectation (LOLE) occurs. To calculate ELCC, a resource is removed to determine the impact on LOLE, and then a reference resource is added back until the original LOLE is obtained.[9] Often the reference resource is called perfect capacity as it represents a resource with 100% availability. The ratio of perfect capacity to the tested resource is the ELCC. An ELCC of 50% means twice as much of the target resource is needed to impact the LOLE as the same amount as the perfect resource. It is important to note that the ability of the target resource to meet the monthly or annual peak is irrelevant to the ELCC calculation. This is because due to the availability of other resources or unit maintenance, the LOLE hours may not always occur during the monthly peaks. In addition, LOLE will not occur in every month; for a summer-peaking system, there may be zero LOLE for winter months.

In a system of predominantly thermal resources that are available 8760 hours a year which are procured to meet the annual peak, there is an expectation that the highest LOLE would be at the time of the annual peak

[8] California Public Utilities Code § 399.26 (d).
[9] Alternatively a resource could be added, and then load added until the LOLE returns to the original amount.

because that is the point in time with the lowest operating reserve margin. In this case, the ELCC value would be highly correlated to the annual peak. In a system with ample resources that have variable output whose output is mutually correlated, it is possible that the correlation between peak load and LOLE may disappear. Suppose the California summer load peaks (not net load peaks) were not in the late afternoon but instead occurred at noon. Because the existing system has a large amount of solar supply to meet the peak load and solar's maximum output is at noon, the resulting LOLE at noon could be zero. This result has an important implication for calculating an ELCC. If no LOLE is measured at the time of a noon peak, then the value of another resource providing capacity at noon would have zero ELCC because the LOLE is also zero. However, that does not mean that particular resource has no ability to meet the hypothetical noon peak, it just means that it cannot reduce LOLE. This is an important point; the ELCC is not a measurement of a resource's ability to provide capacity and energy, it is a measurement of a resource's ability to improve reliability as measured by the modeling of LOLE. Because the RA program is looking at the resource's ability to meet the monthly peaks, and not the LOLE, using ELCC may not be the best approach to calculate qualifying capacity.

From 2012-2018, the CPUC RA program looked at the availability of non-dispatchable and demand response resources from 4 - 9 pm for November through March and 1 - 6pm for April through October.[10] To recognize that the growth of behind the meter solar has moved the peak, as well as the net load peak, later in the day, in 2018 the CPUC moved the assessment hours to 4 - 9 pm year round.[11] This change also brought the CPUC assessment hours in alignment with the CAISO's assessment hours for when capacity must be available. The load impact protocols also examine the deliverability of demand response from 4 - 9 pm.

[10] CPUC D.18-06-030, page 40.
[11] CPUC D.18-06-030, page 43.

Until 2017, the time of the historical CAISO peaks occurred from 3-5 pm.[12] However, in 2018 the annual peak occurred at 17:33, which was 39 minutes later than the previous latest occurrence of the annual peak.[13] This movement also reflected the need to meet a net load peak occurring after the regular load peak. The period of 4 - 9pm is when LOLE is most likely to occur, because the ample solar generation is no longer available in the evening. This result is confirmed by Southern California Edison's (SCE) analysis of LOLE for use in setting time of use costing periods, which found the majority of LOLE to occur from 4 - 9 pm.[14] The CPUC policy on setting costing periods is that they should be forward looking. As a result, the CPUC approved setting the on-peak costing period to 4 - 9 pm for SCE. The CPUC also approved the same hours for the on-peak period for Pacific Gas and Electric. Therefore, both the CPUC and CAISO have determined that the most critical hours for having capacity available are from 4 to 9 pm.

CAISO appears to claim that the LIP examine the wrong hours in the following statement: "The ELCC evaluates a resource's ability to reduce the LOLE, rather than evaluating a resource's maximum load impact capability based on historic events that may or may not align with future system reliability needs."[15] The LIP looks at the resource's ability to reduce demand during the assessment hours of 4 - 9 pm, which is also the same period of hours in CAISO's assessment hours.[16] Therefore, the CAISO is mistaken in its assumption that the LIP does not look at the hours of future availability needs.

Next the CAISO seeks a reliability ELCC valuation of a portfolio of DR resources instead of a DR resource's individual impact on reliability.

[12] CAISO, Peak Load History.
[13] In 2013, the peak occurred at 16:54
[14] SCE, SCE-2 Phase 2 of 2018 General Rate Case Marginal Cost and Sales Forecast Proposals, November 1, 2017. Page 28.
[15] Page 21.
[16] The LIP uses historical data in the regression models, but that information is adjusted for the assessment hours forecast. For example, the historical performance of an air-conditioning cycling program event that occurred from 1-4pm, would be adjusted for the difference in temperature and customer loads that would be expected to be achieved in DR response from 4-9pm.

This does not make sense. One of the short-comings of the CPUC's ELCC calculations of wind and solar is that it lumps together different technologies and locations into an average value for wind or solar. An LSE can acquire a lower-cost resource with lower performance yet claim the higher average ELCC. This leads to overstating its true reliability contribution. The CPUC is looking into taking into account regional and technological differences in calculating ELCC for wind and solar. Since not all DR programs are the same, the ELCC would need to distinguish among the various DR resources.

The CAISO implies that the CPUC uses ELCC for wind and solar because it is an industry standard, but that is incorrect. California state law requires using ELCC for wind and solar which replaced the prior methodology examining performance during a set of assessment hours. The implementation of the ELCC for wind and solar has been a subject of controversy over the modeling assumptions, including the artificial removal of resources in order to obtain LOLE in every month. Without this adjustment it would not be possible to calculate monthly ELCC values for the RA program. A LOLE study is typically used to analyze the reliability of a system. While ELCC is a valuable tool to understand a resource's impact on reliability to the system, it is not necessarily a good fit for the CPUC's RA program that requires specific resource accounting for meeting monthly peak load.

CLECA supports continued research on ELCC and its use to evaluate resources from a planning perspective. However, the CAISO has not performed any analysis that shows using ELCC would produce better results than the current LIP for demand response for the CPUC's RA Program. Adopting a theorical approach without testing its results would be imprudent.

CLECA appreciates that the CAISO is willing to allow variable demand response resources to bid an amount that reflects their capability based upon a forecast. This would remove the current discriminatory treatment to demand response since CAISO already allows the use of forecasts for wind and solar. However, making the use of a forecast conditional on the CPUC approving ELCC for demand response does not give the appearance that the CAISO is supportive of CPUC policy preference for demand response resources by improving their ability to bid into the market. The accounting for resources from a planning perspective for RA is different than the daily operational function. The amount that a resource should be allowed to bid into the market should be based on how it can reasonably be expected to perform and not on a static planning value.

In summary, CLECA recommends the CAISO continue to perform research on the applicability of ELCC for demand response resources and then present the results in a stakeholder process for review. The CAISO should implement its proposal to allow demand response resources to bid an amount that is based upon a local regulatory agency forecast, and not hold it hostage to a separate RA accounting issue.

b. CAISO requests stakeholder feedback on controls needed to ensure that forecasts accurately reflect a resource's capability.

The current LIP methodology has been vetted and reviewed by stakeholders and approved by the CPUC; it is the best option for developing a forecasting tool for real-time performance. Because any change in historical performance is incorporated into the performance of future customer participation, there is a self-control into the process to yield reasonable results. However, the LIP is used for the IOU DR programs and not by resources under the Demand Response Auction Mechanism (DRAM) pilot. The issue of qualifying capacity for DRAM is an issue in the CPUC resource adequacy track and the issue of a forecast for bidding should be included in the scope of work for this stakeholder process. CLECA supports having an accurate forecast for both IOU and DRAM DR resources as the forecast impacts both cost and reliability of the grid.

5. **Non-24x7 settlement of behind the meter NGR**
   a. As a behind the meter resource under the non-generator resource model, any wholesale market activity will affect the load forecast. How will load serving entities account for changes to their load forecast and scheduling due to real time market participation of behind the meter resources?
   b. How would a utility distribution company prevent settling a resource at the retail rate when the behind-the-meter device is participating in the wholesale market?
   c. If a behind-the-meter resource is settled only for wholesale market activity, what would prevent a resource from charging at a wholesale rate and discharging to provide retail or non-wholesale services? How would this accounting work?

6. **Additional comments**

Please offer any other feedback your organization would like to provide from the topics discussed during the working group meeting.