BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Reliable Electric Service in California in the Event of an Extreme Weather Event in 2021.	Rulemaking 20-11-003 (Filed November 19, 2020)

COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION ON ORDER INSTITUTING RULEMAKING EMERGENCY RELIABILITY

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I. Introduction

The California Independent System Operator Corporation (CAISO) submits its comments on the *Order Instituting Rulemaking Emergency Reliability* (OIR) issued by the California Public Utilities Commission (Commission) on November 19, 2020.

The CAISO greatly appreciates the Commission's OIR establishing this proceeding and providing a procedural venue through which the Commission can direct incremental procurement under its existing resource adequacy program. This OIR is crucial to ensure the State can immediately address the resource planning recommendations from the joint Preliminary Root Cause Analysis (PRCA) for summer 2021. The CAISO submits these comments in the spirit of collaboration with a fundamental goal of advancing the reliable decarbonization of the California grid.

The Commission, the California Energy Commission (CEC) and the CAISO prepared the PRCA, which identified important changes to the resource adequacy program to consider the evolution of the generation fleet necessary to support the State's decarbonization goals. The PRCA found that the heat events this past summer resulted in demand for electricity that exceeded the existing resource planning targets and clearly recommended a transition to planning targets that will better support a reliable, clean, and affordable electric resource mix to meet demand in the early evening hours. The PRCA indicated that the current 15% planning reserve margin (PRM), which is instrumental in setting the procurement targets and CAISO backstop authority, was not sufficient to

cover net demand during the critical hours after the load peaked. During these hours, which the CAISO refers to as the net demand peak period, the load levels decreased but did not drop as fast as the energy output from solar resources.

The current 15% PRM covers a 6% operating reserve requirement and a 9% allowance for a combination of forced outages and higher than average load. The PRM currently applies to a monthly "1-in-2" peak demand forecast taken from the CEC's hourly forecast. This construct has not kept up with the performance of the evolving fleet and changes are necessary to ensure the State can continue to operate the electric grid reliably without having to shed load during heat events. The CAISO recognizes that a complete transition to alternative planning targets that consider the net demand after peak are not feasible to achieve by next summer. However, as noted in the PRCA, immediate action is necessary to prevent similar circumstances from threatening near-term reliability. The joint entities and the State should be focused on updating the resource and reliability planning targets to better account for heat storms and the transitioning resource mix necessary to meet the clean energy goals during critical hours.[1]

With this in mind, the CAISO suggests changes to the Commission's resource adequacy program to expedite the regulatory and procurement processes to procure additional resources by summer 2021. Specifically, the CAISO proposes to increase the PRM to 20% for the months of June through October 2021 and apply the PRM to both the gross peak as well as the most critical hour after peak when solar production is very low or zero.

An increase in the PRM to 20% is necessary to reflect the forced outage rate of resources shown in the CAISO's analysis as previously submitted to the Commission.[2] Further, to assist the Commission in its efforts to undertake needed incremental procurement for next summer, the CAISO has prepared a resource stack analysis that identifies additional resource procurement needs. The stack analysis compares existing and soon-to-be online resources plus an average level of resource adequacy imports against the suggested 20% PRM that considers the most critical hour after peak.

[1] PRCA Letter from the CAISO, Commission, and CEC to the Governor at 3.

[2] *See* the CAISO's August 7, 2020 Initial Track 3.B Proposals and Comments on Additional Process, p. 10. http://www.caiso.com/Documents/Aug7-2020-InitialTrack3BProposals-Comments-AdditionalProcess-ResourceAdequacy-R19-11-009.pdf.

The CAISO's stack analysis identifies the need to procure as soon as possible to address a resource gap in the existing fleet that ranges from 450 to 3,300 MW from July through September 2021 based on the 20% PRM. The greatest system resource needs occur in September and will require incremental capacity beyond the currently available and soon-to-be online net qualifying capacity. The CAISO's stack analysis also reveals that although the needed capability may be available in the existing fleet for June and October, because the current PRM construct does not capture the most critical hour after peak, it is not clear this capacity will be procured and available absent the changes the CAISO proposes to the PRM for next summer. Therefore, the Commission should work to adopt the changes to the PRM for June through October to secure resources physically capable of providing energy or curtailing load for a minimum of four consecutive hours, between 4 p.m. to 9 p.m.

The analysis supports the need for four major actions that need to be taken as soon as possible to assist the State in avoiding load shedding events in summer 2021. First, the State must secure imports backed by firm transmission rights and not recallable by the host balancing authority when system conditions are tight throughout the West. Second, the State should access any additional capability from the existing gas fleet that may be available with upgrades to existing facilities. These first two actions will secure needed incremental capacity missing from the existing fleet, which the analysis shows is particularly acute in the months of July through September. The CAISO notes as well that preparations for contracting for such resources should be expedited to the maximum extent possible. Third, the State must seek to secure resources that are leaning towards retirement, but are still needed to meet system or local reliability needs. The proposed PRM changes will enable procurement of resources that may otherwise be at risk of retirement and will minimize actions outside of the resource adequacy program to secure those resources. Finally, the State must ensure storage resources are installed, charged and ready to perform during the net demand peak period. Although, much of the storage resources have already been contracted for, the proposed PRM changes will signal the need for new contractual arrangements that support storage resources being charged and available during the net demand peak period. The CAISO stands ready to work with storage providers and load serving entities to ensure a successful summer 2021 storage

operation and explore longer-term enhancements to support the commercial and operational success of storage as a key reliability resource for California.

The incremental procurement required in this proceeding should be part of the Commission's resource adequacy program for 2021 overall so that procured capacity is subject to the same downstream requirements under the CAISO's tariff and associated processes—such as the must-offer requirements and the ability for the CAISO to backstop for deficiencies under the Capacity Procurement Mechanism (CPM).[3] Because it is crucial that the incremental procurement occur prior to the time the load serving entities must submit their monthly showings under the Commission's resource adequacy program, the Commission should issue a proposed decision for June through October 2021 procurement by mid-March, to ensure the Commission can vote on a final decision at its April 15, 2021 business meeting.

The changes adopted in this proceeding should apply for calendar year 2021 and 2022. If the Commission does not extend the changes proposed and adopted in this proceeding to 2022, the Commission should adopt these same interim PRM changes in the annual resource adequacy proceeding for the 2022 compliance year. Incremental procurement for new capacity may have to be addressed simultaneously in the integrated resource plan (IRP) proceeding. Given the discussions in the resource adequacy proceeding and the CAISO's Resource Adequacy Enhancements Stakeholder initiative,[4] the CAISO expects a long-term, holistic solution to be in place for resource adequacy year 2023. That long-term solution will address unit-specific outages and other aspects of the PRM as well as system forecast demand basis.

Finally, the CAISO recommends the Commission limit the scope of discovery in this proceeding. The Commission Scoping Memo should specify that unit specific resource performance and bidding data are not discoverable within the scope of this proceeding. Although aggregated unit performance may be relevant to the issues under consideration in this proceeding, requests for individual unit performance are not likely to

[3] By increasing the Commission's resource adequacy requirement for its LSEs, the CAISO will also be able to validate compliance with the local regulatory authority's requirements via resource adequacy showings and use the CAISO's backstop CPM authority to address any deficiencies.

[4] Details regarding this stakeholder initiative is available at https://stakeholdercenter.caiso.com/StakeholderInitiatives/Resource-adequacy-enhancements.

lead to admissible evidence. Also, such data requests are likely to be unduly burdensome, expensive, and intrusive. The Commission should limit these burdensome data requests in the Scoping Memo, to allow the CAISO and other parties to focus on producing information that is relevant to forward-looking grid needs.

The CAISO welcomes feedback on these recommendations and looks forward to working closely with the Commission, the CEC, and parties to ensure the reliable operation of the electric grid through summer 2021.

II. Discussion

In this section, the CAISO responds to the specific questions posed in the OIR. The CAISO reproduces the relevant questions prior to providing its response. This section omits any questions for which the CAISO does not have a response at this time.

Question 1: Should the Commission consider directing the IOUs to design a new paid advertising program for distributing CAISO's Flex Alerts in various outlets, including social media? If so, how should the Commission authorize a budget dedicated to this purpose and what measures and budget level should be considered?

Yes, the Commission should direct the IOUs to design a new paid advertising program for distributing CAISO's Flex Alerts in various outlets, including social media and enhanced social media mechanisms. The outlets should include direct-to-customer messaging that the CAISO can trigger during a Flex Alert event. The budget should allow translating Flex Alerts messaging into multiple languages. In addition, the funding should enable modernized messaging, *e.g.*, using smart devices, to encourage consumers to take proactive steps toward reducing demand, such as pre-cooling homes during hours prior to the critical demand period. Testing may be necessary for new messaging to ensure comprehension and effectiveness.

Question 2: Should the Commission modify the Critical Peak Pricing (CPP) program to increase the number of allowed events per year, modify other attributes, or provide guidance on when the program should be dispatched?

Yes, the Commission should seek to modify the CPP and other similar programs that can reliably reduce load during the net demand peak period from 4 p.m. to 9 p.m. Such load reduction must be reliable and verifiable to inform and appropriately adjust the load forecast because CPP is a load modifying resource. The Commission should ensure

sufficient coordination and data sharing with the CEC so CPP and other load modifying programs are appropriately reflected in the demand forecast.

Question 3: Should the Commission explore potential options to encourage non-IOU LSEs to develop programs similar to CPP?

Yes. See response to Question 2. The Commission should coordinate with the CEC to ensure non-IOU LSEs demand forecasts consider similar pricing programs adopted by such entities.

Question 4: Should the Commission increase IOU marketing funds to increase enrollment in CPP or take other actions to increase customer participation in the program?

Yes. See response to Question 2 and 3.

Question 5: Should the Commission establish a new out-of-market and outside the RA framework emergency load reduction program (ELRP) that could be dispatched by CAISO/IOUs under specified conditions where participants are compensated only after the fact and based only on the amount of load reduction achieved during the dispatch window? If so, what are the key program design elements (e.g., dispatch conditions, compensation level, load reduction measurement considerations, target customer segments, etc.) that should be considered or incorporated? What other issues (such as interactions with existing supply-side and load-modifying programs) need to be considered in order to establish an ELRP? How should these issues be addressed?

The CAISO appreciates this innovative approach for meeting electric system needs and strongly agrees any such program must remain separate and distinct from the resource adequacy program. Although ELRP can help reduce load reduction during net demand peak period, it is critical such programs not reduce load serving entities' resource adequacy obligations because these resources are out-of-the-market. Furthermore, the ELRP should provide load curtailment rather than generation export, as the CAISO explains in response to Question 6.

The CAISO will work closely with the Commission and investor owned utilities (IOUs) to develop the appropriate dispatch trigger and dispatch window for the ELRP. As an example, the dispatch trigger could be a Warning or Stage 1 emergency or its equivalent.[5] The ELRP could have multiple dispatch windows. For example, one

[5] The North American Electric Reliability Corporation (NERC) uses slightly different terminology.

dispatch window could be from 5 a.m. through 9 p.m., while another narrower window could be set during the net demand peak period (*i.e.*, 4 p.m. to 9 p.m.). Customers could choose a dispatch window consistent with their energy needs, and the different options could have different compensation structures.

As discussed in greater detail in response to Question 13, the Commission should instruct resource adequacy compensated emergency demand response to be available for dispatch before the CAISO issues a Warning and preferably in the day-ahead timeframe. This will better ensure these resources are dispatched before the CAISO utilizes and depletes non-resource adequacy resources. The ELRP program could allow voluntary non-resource adequacy emergency load curtailment dispatch at a Warning or Stage 1 emergency, and compensate resources for the provided emergency load curtailment. The ELRP would provide "insurance value" beyond what is provided by resource adequacy, and in doing so, would protect against extreme events—like the one experienced in August 2020—that otherwise could lead to involuntary load shedding.

If the Commission implements an ELRP, it should ensure there is a process to verify associated load reduction given the after-the-fact financial settlement. In addition, there must be assurance that these load modifying actions are incremental to existing supply-side and load-modifying programs. The CAISO also will need hourly estimates of the potential demand reduction (in MW) and after-the-fact verification information regarding the ELRP to accurately inform its short-term load forecasting processes for day-to-day market operations. Lastly, the CEC may ultimately need such information to inform and appropriately adjust the long-term forecast used in the Commission and CAISO planning processes.

The CAISO defers to the Commission and IOUs regarding the appropriate target customer segments, but the CAISO understands that during the mid-August heat wave a broad range of participants—from data centers equipped with backup generation to military installations—provided a variety of helpful emergency load reductions.[6]

[6] PRCA, Section 5: Actions Taken During August 16 Through 19 to Mitigate Projected Supply Shortfalls.

Question 6: Should the Commission allow BTM hybrid-solar-plus-storage assets to participate and discharge their available capacity in excess of onsite load (and thus export to the grid) and receive compensation for the load reduction, including exported energy, under ELRP? Should this capability be expanded to include BTM stand-alone storage as well? Are there any Rule 21 or safety and reliability considerations that need to be addressed to permit storage, with or without NEM pairing, to export energy while participating in the ELRP? How should any safety and reliability issues be addressed?

As the CAISO noted in response to Question 5, the ELRP should not qualify as resource adequacy capacity, nor should it reduce LSE resource adequacy requirements. The ELRP's purpose should be to provide insurance value beyond the resource adequacy program. Furthermore, the ELRP must be verified as incremental load reduction compared to existing supply-side and load-modifying programs.

As proposed, the ELRP seems to be an out-of-the-market program, which may have a CAISO or IOU trigger, but it is not a market-integrated resource dispatched by CAISO systems or operators. Therefore, the CAISO would not directly compensate any "exported" energy as a sale of energy in the wholesale electricity market. If the "exported" ELRP energy is not settled by the CAISO—similar to a NEM transaction—then the Commission should ensure this energy is appropriately accounted for in load forecasts (as requested in response to Question 5) and that it meets and maintains the safety and reliability of the distribution system. The Commission should study energy exported onto both the distribution and transmission system under the appropriate interconnection processes, including Rule 21 safety and reliability considerations. Developing an emergency program in this proceeding should focus on creative funding opportunities to unlock latent and untapped load reduction capabilities, but it should not be used to bypass current reliability and safety processes.

Question 8: Should the Commission consider expedited procurement, including through the cost allocation mechanism for additional reliability procurement (*e.g.,* expansion of existing gas-fired resources) that could be online for Summer 2021 and 2022? If so, how could this occur in order for the additional capacity to be online on time to address summer reliability needs. If not, why not?

The CAISO strongly supports expedited reliability procurement of incremental physical resources that can address grid needs during the net demand peak period after the gross peak for summer 2021 and summer 2022. The Commission should order this

expedited procurement as soon as possible in order to allow load serving entities to contract for additional resources prior to summer 2021.

The PRCA correctly points to the net demand peak period as the most critical for system reliability. This period represents the most critical system conditions because significant renewable penetration has "shifted" the net demand peak to later in the day. The PCRA notes that "[o]n hot days, load later in the day may still be high, after the gross peak has passed, because of air conditioning demand and other load that was being served by behind-the-meter solar com[ing] back on the system."[7] To address this concern while maintaining reliability during the gross demand peak, it is critical that the Commission order expedited procurement for resources incremental to the existing fleet. However, these resources should not merely substitute for or replace existing capacity under contract, because existing capacity under contract remains necessary to meet the gross demand peak.

To ensure that the necessary resources are procured to meet both the peak and the most critical hour after peak, the CAISO recommends that the Commission adopt a 20% PRM for its load serving entities for the months of July through October 2021. As the CAISO explains in response to Question 9 below, this increased PRM should apply to both the peak demand hour and most critical hour after peak when solar production is very low or zero. Temporarily increasing the PRM will incentivize load serving entities to both procure additional resources and show those resources to the CAISO for resource adequacy purposes.

The interim update to the PRM the CAISO proposes in this proceeding will provide a mechanism for contractual arrangements necessary to provide resources a reasonable assurance of recovering the costs of any necessary capital investments to produce additional capability. For example, to the extent additional investments are ncessary to capture additional capacity from the existing gas fleet, the incremental procurement directed by the Commission would enable those arrangements. Similarly, the procurement directives would enable any additional investments needed to ensure imports are backed by firm transmission and non-recallable energy.

[7] PRCA, p. 79.

The CAISO understands that it may be difficult for load serving entities to conduct additional procurement to meet a 20% PRM by summer 2021, but the increased PRM will allow the CAISO to use its CPM to backstop for additional capacity in the month-ahead timeframe if load servings entities are unable to meet the 20% PRM for 2021. Increasing the PRM and providing for appropriate cost recovery measures, will ensure that the Commission, load serving entities, and the CAISO have the tools to procure all available resources necessary to meet summer 2021 needs.

Question 9: If the CEC, CAISO, or the CPUC conducts additional analyses regarding Summer 2021 load forecasts, should the Commission consider a mechanism to update RA requirements in April for the summer of 2021 or would it be appropriate for CAISO to use its capacity procurement mechanism (CPM) to procure additional capacity for the summer of 2021, should it be deemed necessary?

The CAISO supports immediate, interim resource adequacy program changes to enable additional resource adequacy procurement for summer 2021 and 2022. Although the Commission should make additional changes to the resource adequacy program beyond 2022, the specific, additional changes the CAISO recommends herein would only apply for 2021. Discussions in the Commission's resource adequacy proceeding and the CAISO's Resource Adequacy Enhancements stakeholder initiative indicate a more long-term, holistic solution is expected to be in place for resource adequacy year 2023 and beyond.

The CAISO requests the Commission take the following actions for 2021: (1) temporarily increase the PRM to 20% for the months of July through October for the peak and most critical hour after peak to ensure necessary incremental capacity is procured; (2) immediately authorize procurement through the resource adequacy program based on the CAISO's 2021 resource stack analysis; and (3) develop a schedule that permits a final decision no later than the April 15, 2021, business meeting.

Increasing the PRM is a foundational element of the CAISO's proposal. As the CAISO explained in response to Question 8, the increased PRM will incentivize load serving entities to both procure additional resources and show those resources to the CAISO. Acknowledging that it likely will be difficult for load serving entities to conduct additional procurement to meet a 20% PRM by summer 2021, the increased PRM will

allow the CAISO to use its CPM to backstop for additional capacity in the month-ahead timeframe if load serving entities are unable to meet the 20% PRM for 2021. Without increasing the PRM, the CAISO's CPM backstop authority is limited to the operational timeframe. If the Commission increases the PRM, the CAISO can use its CPM to backstop to meet the higher requirement in the month-ahead timeframe.

The Commission Should Temporarily Increase the Planning Reserve Margin to 20%

The PRCA recognized that current resource planning levels are not designed to fully meet an extreme heat storm like the one experienced in mid-August 2020. This has led to LSEs procuring insufficient resources to meet demand in the early evening hours. The CAISO agrees with revising the existing 15% PRM to better account for both unit-specific forced outages and higher than average load.

In the long-term, the CAISO supports adopting a new "bottom-up" approach to establishing a reliable PRM considering unit-specific forced outage rates.[8] This approach would establishes minimum system resource adequacy requirements based on unforced capacity (UCAP) values for generators to maintain reliability. This approach is necessary to equitably address the growing number of local regulatory authorities and their potential variance in PRM targets. A resource adequacy requirement based on UCAP should also help mitigate the potential for capacity leaning among load serving entities. The CAISO's proposal can also accommodate a higher than 1-in-2 load forecast level. The CAISO is advancing its proposal in both the resource adequacy proceeding and the CAISO stakeholder process and is targeting implementation for the 2023 resource adequacy year.

However, to address the immediate summer 2021 needs, the CAISO proposes that the Commission temporarily implement a 20% PRM for both the peak and the most critical hour after peak when solar production is very low or zero. This will ensure sufficient procurement occurs to meet summer 2021 reliability needs and will provide the CAISO with an adequate basis to use its CPM backstop authority in the month-ahead timeframe. In addition, by requiring a 20% PRM at both the peak and most critical hour

[8] CAISO, Aug 7, 2020 Initial Track 3.B Proposals and Comments on Additional Process, R.19-11-009, August 7, 2020.

after peak, load serving entities will be precluded from substituting new incremental capacity in place of existing resource adequacy capacity that would otherwise be under contract.

The current 15% PRM accounts for a 6% operating reserve requirement and a 9% allowance for a combination of forced outages and higher than average load. The Commission should increase the PRM to 20% for June through October 2021. This 20% PRM reflects a 6% operating reserve requirement, 10% for forced outages, and 4% for higher than average 1-in-2 system load. As noted in CAISO's Resource Adequacy Enhancements stakeholder process, the average forced outage rate on the CAISO system is approximately 10%.[9] The 4% allowance for higher than average load is approximately the difference between a 1-in-2 and 1-in-5 system demand.[10]

The Commission Should Apply the 20% Planning Reserve Margin from June Through October 2021 to the Peak and Most Critical Hour After Peak

Consistent with current practice, the 20% PRM should apply to the peak hour. Additionally, the Commission should apply the 20% PRM to the most critical hour after peak when load is still relatively high, but intermittent resource generation is below its capacity value and output is rapidly declining. The PRCA specifically points to the net demand peak period—the peak of load net of solar and wind generation resources—as an especially challenging period for grid operations during the August 2020 heat storm. Significant renewable penetration has "shifted" the peak to later in the day and "[o]n hot days, load later in the day may still be high, after the gross peak has passed, because of air conditioning demand and other load that was being served by behind-the-meter solar comes back on the system."[11] To immediately address this need, the Commission should

[9] *See* http://www.caiso.com/InitiativeDocuments/Presentation-ResourceAdequacyEnhancements-Sep15-17WorkingGroup.pdf at slide 47 for the CAISO demonstration of this estimate. See also CAISO's proposal for developing resource-specific outages in: CAISO, Aug 7, 2020 Initial Track 3.B Proposals and Comments on Additional Process, R.19-11-009, August 7, 2020.

[10] The 20% PRM is also directionally consistent with Energy Division staff analysis presented at the Track 3.B resource adequacy workshop. CPUC Energy Division Staff, Presentation 3: 2022 Loss of Load Expectancy Study Preliminary Results, Track 3.B Workshops: Day 2, November 23, 2020. Analysis focused on 2022 and did not consider maintaining non-spinning reserves.

[11] PRCA, p. 79.

ensure capacity and energy procurement resulting from this OIR can physically provide energy or load curtailment during the net demand peak period as described below.

To address 2021 resource needs, the Commission should target the required procurement for the months of June through October, rather than the summer months period of May through October typically used in the resource adequacy proceeding. Although May is also a critical month for resource needs, this slight adjustment recognizes the timing in this proceeding likely does not allow for additional resource adequacy procurement for May 2021. However, if the Commission adopts a decision by April 15 or earlier, it could still be possible to increase resource adequacy capacity shown on supply plans for June 2021 (due 45 days before June 1).

The Commission Should Authorize Procurement Immediately Based on Guidance Provided by CAISO Analysis

As noted in response to Question 8, the CAISO strongly supports expedited reliability procurement for incremental physical resources that can address grid needs during the most critical hour after peak. To support procurement, the CAISO submits herewith a stack analysis focused on meeting load plus a 20% PRM during the most critical hour after peak for each month June through October 2021. The CAISO conducted its analysis on the hour that ends (hour ending, HE) at 8 p.m. Pacific Daylight Time (PDT) because solar generation is or is almost at zero by the end of the hour but the load remains relatively high compared to the peak.[12] Table 1 below shows this relationship. In July and August, the load for HE 8 p.m. PDT is over 1,000 MW lower than the peak of the month, which occurs an hour or two earlier. For June, September, and October, the difference is much smaller.

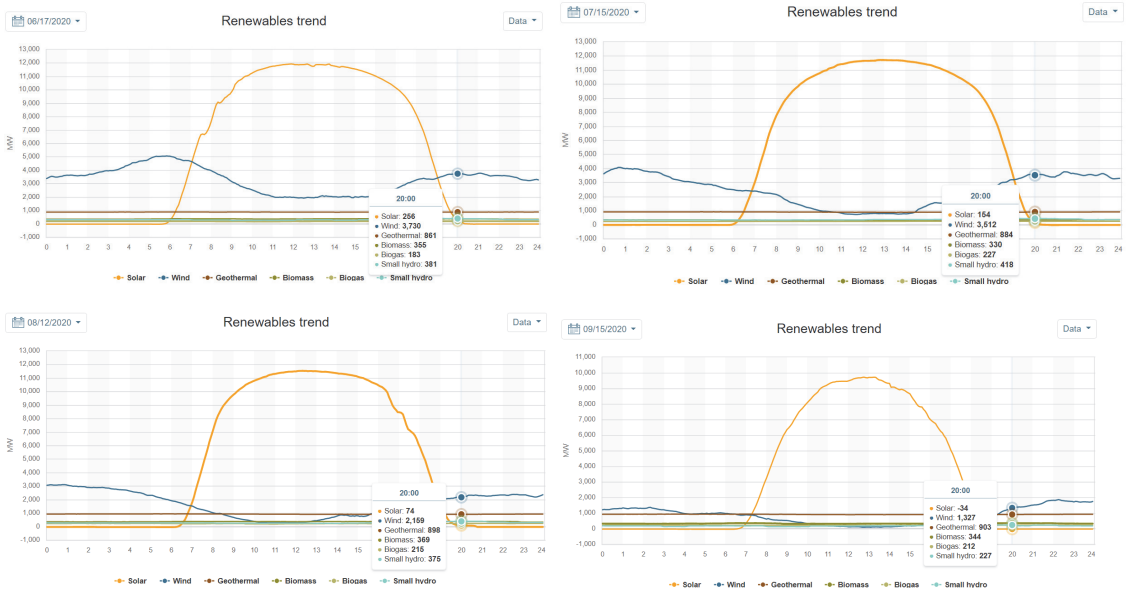
[12] The net demand peak does not always occur between 7 p.m. and 8 p.m. PDT. All times throughout this filing are noted in PDT.

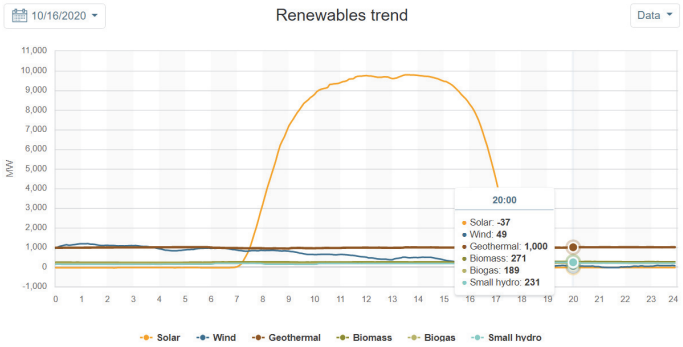
Table 1: Comparison of June-October 2021 Peak Demand and Load for HE 8 p.m. PDT

Month	Peak demand (MW)	Peak demand hour ending (PDT)	Load for HE 8 p.m. PDT	Peak demand minus HE 8 p.m. PDT load ([B] - [D])
[A]	[B]	[C]	[D]	[E]
June	41,421	7 p.m.	41,104	317
July	44,485	6 p.m.	43,306	1,179
August	44,679	6 p.m.	43,644	1,035
September	45,184	7 p.m.	44,861	323
October	37,271	8 p.m.	37,271	0

Figure 1 below shows five illustrative snapshots of renewable generation in the CAISO market from the middle of each month from June through October 2020. Each figure shows that by 8:00 p.m. PDT (shown as military time 20:00) solar generation declines from a peak of approximately 10,000 MW or more to less than 300 MW.

Figure 1: Illustrative Snapshots of Renewable Generation in CAISO Footprint mid-June-October 2020





For simplicity and as a conservative measure, the CAISO assumed zero solar generation in the stack analysis. For all other resources, the analysis reflects the 2021 net qualifying capacity (NQC) values available for each month, resources that are expected to be online by summer 2021 by month, and resource adequacy imports based on the historical average from 2015 through 2020 for each month. The total resource stack is compared to the California Energy Commission's (CEC's) 2019 Integrated Energy Policy Report (IEPR) mid-mid managed 2021 hourly demand forecast for the CAISO footprint plus a 20% PRM.[13] Attachment A contains inputs, assumptions, and a description of the methodology, and Attachment B contains the spreadsheets.

Figure 2 below shows the stacked resource columns for June through October 2021 compared with the load for HE 8 p.m. PDT plus a 20% PRM. Table 2 below provides the numerical comparison between the total resource stack versus the load for HE 8 p.m. PDT plus a 20% PRM. For illustrative purposes the table also includes a 15% PRM applied to the load for HE 8 p.m. PDT.

[13] Note that the CEC IEPR data is in Pacific Standard Time, which does not reflect daylight saving.

Figure 2: June – October 2021 Resource Stack vs. Load for HE 8 p.m. PDT Plus 20% PRM

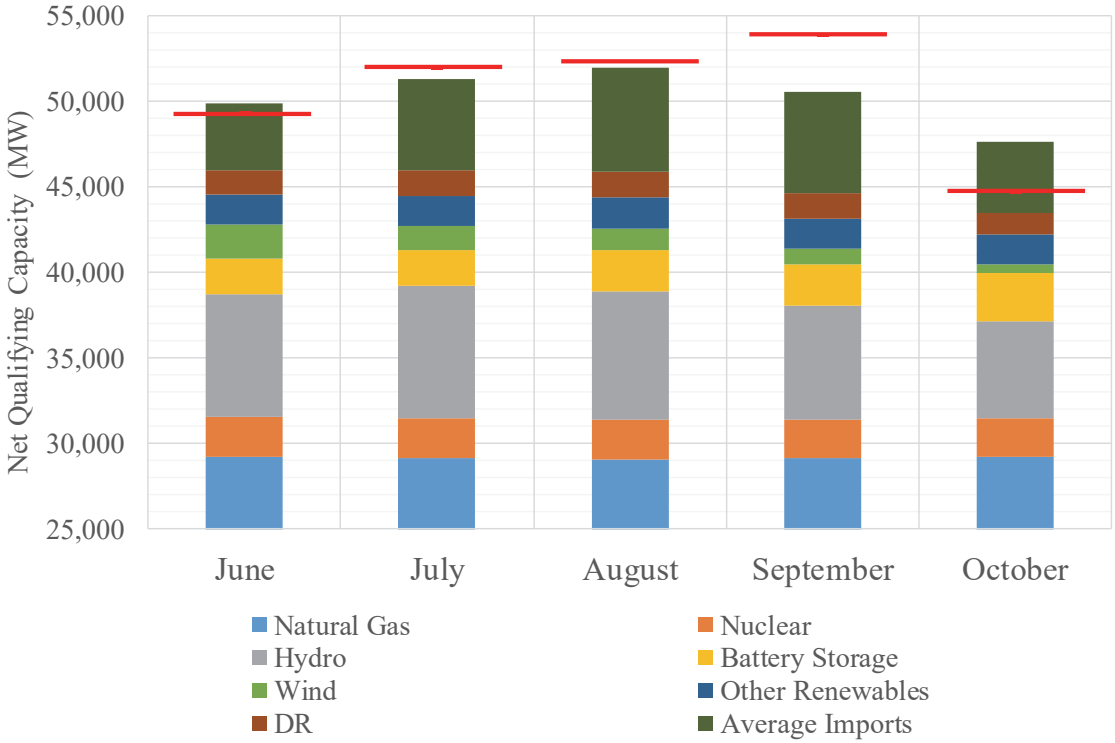


Table 2: Comparison of 2021 Total Resource Stack and Load for HE 8 p.m. PDT Plus 15% and 20% PRM

Month	Total resource stack with average RA imports (MW)	15% PRM plus load for HE 8 p.m. PDT	20% PRM plus load for HE 8 p.m. PDT	Total resource stack minus 15% PRM plus load ([B] - [C])	Total resource stack minus 20% PRM plus load ([B] - [D])
[A]	[B]	[C]	[D]	[E]	[F]
June	49,855	47,270	49,325	2,585	530
July	51,241	49,802	51,967	1,439	(726)
August	51,921	50,191	52,373	1,730	(452)
September	50,518	51,591	53,834	(1,073)	(3,316)
October	47,601	42,861	44,725	4,740	2,876

The results show a distinct difference between the five months. For June and October, the 20% PRM level (shown as horizontal red lines in Figure 2) is below the total resource stack. This signals that for June and October there may be sufficient net qualifying capacity (NQC) available for procurement to satisfy a 20% PRM. In other

words, for these two months load serving entities may be able to contract with existing resources to sufficiently respond to the most critical hour after peak. Table 2 contains the exact numbers. The Commission should order procurement immediately to ensure load serving entities can contract with available resources that can effectively serve load and meet the increased PRM at peak and during HE 8 p.m. PDT. As with all resource adequacy capacity, the Commission should ensure load serving entities procure resources physically capable of providing energy or curtailing load for a minimum of four consecutive hours, between 4 p.m. to 9 p.m. Although the stack analysis shows the required flexibility is possibly available given the resources listed on the 2021 NQC list, it is not certain that they will be procured to meet both peak and the most critical hour after peak. This illustrates why it is important that the Commission require the incremental procurement for the months of June and October.

On the other hand, the resource stacks in July through September fall below the 20% PRM level for HE 8 p.m. PDT as shown on Figure 2. This means there is insufficient capacity to meet the requirement even when including all of the resources on the NQC list, new resources expected online by summer 2021, plus an average level of resource adequacy imports. For July and August the shortfall between the total resource stack capacity and the load plus 20% PRM is approximately 700 MW and 450 MW, respectively, (shown as a negative value in Table 2, column [F]). However, the gap for September is over 3,300 MW (shown as a negative value in Table 2, column [F]) based on a 20% PRM. Even with the current 15% PRM there is almost a 1,100 MW shortfall in September (shown as a negative value in Table 2, column [E]). The gaps for the months of July through September must come from capacity not currently in the resource stack. The Commission should authorize procurement as soon as possible for: (1) resource-specific imports with firm transmission that are non-recallable by the host balancing authority; (2) expedite any incremental procurement from Decision (D.) 19-11-016; (3) incremental physical capacity from existing and new resources; and (4) incremental load curtailment.

The Commission Should Authorize Procurement Through the Resource Adequacy Program

The Commission should use the resource adequacy program to direct procurement of the additional capacity to ensure there is downstream coordination with CAISO processes such as CPM and resource adequacy validation. First, the Commission should encourage load serving entities to show all owned or contracted capacity to the CAISO so that such resources are reflected as resource adequacy capacity in the CAISO's systems. If capacity is not specifically identified as resource adequacy capacity, market participants can designate that capacity in support of their export self-schedules, which will have a higher priority in the CAISO day-ahead and real-time markets than exports that are not so designated. Designating the resources as resource adequacy capacity will help ensure energy is offered and prioritized to serve internal CAISO load rather than being offered as non-resource adequacy resources that could be used to explicitly support exports.

Second, increasing the PRM and procuring resources through the resource adequacy program means that the Commission is leveraging the appropriate "front stop" mechanism to increase the resource adequacy requirement. If there is insufficient resource adequacy procurement to meet the revised RA requirements, the CAISO can then use its CPM authority to backstop for any RA deficiencies. If the timing of this OIR does not allow for changes to the resource adequacy program to fully take effect and/or allow for additional procurement prior to summer 2021, the CAISO will work with the Commission to consider other options for procuring the resources necessary to maintain reliability.

The Commission Should Develop a Schedule that Allows for Adoption of a Final Decision No Later Than the April 15, 2021 Business Meeting

The Commission should expedite the schedule for this proceeding to ensure there is sufficient time for load serving entities to procure the additional resources required to maintain reliability for June through October 2021. The current schedule targets a Proposed Decision no later than April 30, 2021, which means the Commission cannot approve a decision until its June 3, 2021 business meeting, at the earliest. The CAISO urges the Commission to issue a proposed decision no later than mid-March so that it can

adopt a final decision no later than its April 15, 2021 business meeting, preferably earlier.[14]

Question 10: Should the Commission undertake a stack analysis of the amount of resources that would be necessary for Summer of 2021?

See response to Question 9.

Question 11: Should the Commission consider requiring that load serving entities expedite the IRP procurement they have scheduled to come online? How would the Commission provide equitable incentives so that the expedited process does not disproportionately increase costs for that LSE? If so, please explain how this would work. If not, why not?

Yes, the Commission should require load serving entities to expedite the IRP procurement they have scheduled to come online. For 2021, there likely is limited ability to advance online dates, but even expediting on-line dates by one month—from August to July—will be helpful in meeting the proposed 20% PRM. Expediting online dates is likely more feasible for 2022 and 2023. Otherwise, the Commission will have to rely on the updates the CAISO proposes to the PRM for next summer to provide the incentives for any capital investments needed to expedite resources coming online for summer 2021.

Question 12: Are there other opportunities for increasing supply for the summer of 2021 and/or reduce demand that the CPUC has not considered? If so, please provide details of these supply or demand resources and please explain how they can address reliability needs in the timeframe discussed in this OIR.

See response to Question 9.

Question 13: Should the Commission consider revisions to the reliability DR programs (Base Interruptible Program-BIP, Agriculture Pump Interruptible-API, AC cycling) that allow these programs to be triggered before the Warning stage (*e.g.*, after an Alert in the day-ahead timeframe)? If so, under what conditions and how would this work? If not, why not?

The Commission should require reliability demand response resource (RDRR) programs to bid into the CAISO's day-ahead market so they can be considered in both the integrated forward market and residual unit commitment processes. Currently RDRR is activated only in real-time after the CAISO calls a Warning Stage event or higher.

[14] Based on the current Commission voting meeting schedule, there is only one meeting in April 2021. *See*: https://www.cpuc.ca.gov/General.aspx?id=6442466589

This leaves little time for CAISO to integrate RDRR into the market and for consumers to prepare for load curtailment. Specifically not having access to RDRR in the day-ahead market means other resources, including non-resource adequacy resources, clear the market and receive market awards before programs the Commission has expressly funded for this purpose. In fact, appeals for voluntary public conservation via Flex Alerts are often sent out in the day-ahead timeframe before these fully funded programs are used.

The Commission should require these programs be shown on resource adequacy supply plans and bid into the day-ahead and real-time markets on a daily basis. As designed, the resources already bid in at very high prices (*e.g.*, $950/MWh) so they only clear the market in extreme circumstances if needed. Moreover, if RDRR is not emergency-triggered, the CAISO can pre-dispatch the resources and provide customers with earlier notification.

Question 14: Are there other changes to the BIP that would make it more effective to meet load under a variety of conditions during the summer of 2021 (*e.g.*, expansion of the 2% cap, mid-year enrollment, trigger notification time, etc.)?

See response to Question 13. Regardless of the changes, BIP and RDRR should be shown on resource adequacy supply plans. The Commission should not expand the 2% cap on BIP resources if the program continues to count as resource adequacy capacity *and* maintains an emergency-only trigger, even if the trigger is earlier than a Warning. It is imprudent to expand the resource adequacy program to include resources that are dispatchable only during emergency events. The Commission struck the appropriate balance in this OIR in categorizing ELRP as outside of the resource adequacy program, so this pool of emergency-only load curtailment does not erode the integrity of the resource adequacy program.

Question 18: Should the Commission consider measures to minimize potential attrition and loss of capacity in existing utility DR programs, such as increasing incentives, reducing dispatch activity limits, and clarifying expectations regarding when programs are dispatched?

The CAISO supports increasing incentives, reducing dispatch activity limits, clarifying expectations, and other efficiency improvements. The goals of this OIR should be to increase the Commission's and CAISO's ability to conduct resource planning and

grid operations under conditions of increased uncertainty and variability. The Commission should expand demand response programs to provide more flexibility (*e.g.*, more calls, longer durations) and optionality (*e.g.*, include weekend response). Customer fatigue and attrition should be addressed in other ways such as creating larger customer pools and rotating through them to limit the exposure for any particular pool, while ensuring overall program flexibility and optionality. Similarly, storage-backed and price-responsive programs may offset attrition.

III. Conclusion

The CAISO appreciates the opportunity to submit these comments in the spirit of collaboration with a fundamental goal of advancing the reliable decarbonizing the California grid. The CAISO looks forward to working with the Commission, CEC, and parties to implement the necessary steps to maintain system reliability.

Respectfully submitted

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ATTACHMENT A

CAISO Inputs, Assumptions and Methodology for Resource Stack Analysis

Attachment A

CAISO Inputs, Assumptions and Methodology for Resource Stack Analysis

The CAISO prepared a resource stack analysis that identifies additional resource procurement needs for the 2021 summer months. The stack analysis compares existing and soon to be online resources plus an average level of resource adequacy imports against an increased planning reserve margin (PRM) that considers the most critical hour after peak. Table A-1 below summarizes the input assumptions for Table 1, Table 2, and Figure 2 for June through October 2021. For completeness, the CAISO workbook (Attachment B) also includes May 2021 data and analysis.

Table A-1: CAISO Load and Resource Assumptions for Stack Analysis

System Requirement	
System Requirement	CAISO proposed 20% planning reserve margin applied to load for the peak hour and hour ending (HE) 8 p.m. Pacific Daylight Time (PDT). Current system requirement is based on a 15% PRM applied to load for the peak hour.
Load	• California Energy Commission 2019 Integrated Energy Policy Report (2019 IEPR) 1-in-2 system peak Mid-Mid Load • Used 2021 forecast for HE 8 p.m. Pacific Daylight Time (PDT) which is HE19 Pacific Standard Time (HE19 PST) in 2019 IEPR data. IEPR dataset is entirely in PST, which does not consider daylight saving. https://efiling.energy.ca.gov/GetDocument.aspx?tn=231555&DocumentContentId=63372

Planning Reserve Margin (PRM)	20%comprised of:
	• 6% for operating reserves
	  ○ https://www.nerc.com/pa/Stand/Glossary%20of%20Terms/Glossary_of_Terms.pdf
	  ○ https://www.nerc.com/_layouts/15/PrintStandard.aspx?standardnumber=BAL-002-WECC-2a&title=Contingency%20Reserve&jurisdiction=United%20States
	• 4% for load above 1-in-2 system demand
	  ○ Reflect the approximate difference between a 1-in-2 and 1-in-5 peak forecast. For example, CAISO footprint coincident peak for 2021 is 45,184 MW for the 1-in-2 forecast. The 1-in-5 forecast from the same data set is 47,108 MW, or 4.3% higher. An increase from the 1-in-2 to the 1-in-10 forecast reflects a 6.6% increase in the peak demand.
	  ○ https://efiling.energy.ca.gov/GetDocument.aspx?tn=232306&DocumentContentId=64306
	• 10% for forced outages
	  ○ See slide 47: http://www.caiso.com/InitiativeDocuments/Presentation-ResourceAdequacyEnhancements-Sep15-17WorkingGroup.pdf. See also CAISO's proposal for developing resource-specific outages in: CAISO, Aug 7, 2020 Initial Track 3.B Proposals and Comments on Additional Process, R.19-11-009, August 7, 2020

Generation	
Net Qualifying Capacity	Final Net Qualifying Capacity (NQC) Report for Compliance Year 2021: http://www.caiso.com/Documents/NetQualifyingCapacityList-2021.xlsx (Version dated November 13, 2020.) Resource IDs from the NQC list were cross-referenced with CAISO MasterFile for resource category verification.
Gas Generation	
Existing Gas Generation	Existing generators from 2021 NQC list based on values for each month of analysis. Includes once-through cooling (OTC) units: Alamitos Units 3, 4, and 5; Huntington Beach Unit 2; Ormond Beach Units 1 and 2; and an extension of Redondo Beach Units 5, 6, and 8. Does not include Announced Retired and New Units. Dynamic scheduled generators included in Imports.

New Units	Based on CAISO confidential interconnection queue information. Only includes aggregate of new resources with expected in-service date (ISD) prior to each month.
Hybrid resources	
Hybrid resources	For this expedited analysis, hybrid resources are reflected as the individual components of the hybrid system. In future, the CAISO may improve the analysis to reflect the hybrid system.
Hydro (including Pumped Storage)	
Large Hydro	>30 MW hydro resources within the CAISO footprint. Qualifying capacity based on 2021 NQC list based on monthly values. Dynamic scheduled generators included in Imports.
Small Hydro	≤30MW, RPS eligible resources within the CAISO footprint. Qualifying capacity based on 2021 NQC list based on monthly values.
Pumps with net qualifying capacity	Pumps designated to provide ancillary services with an NQC value. Qualifying capacity based on 2021 NQC list based on monthly values.
Pumped Storage	Includes Eastwood, Helms, Lake Hodges, and San Luis.
Nuclear	
Nuclear	Diablo Canyon only. Qualifying capacity based on 2021 NQC list based on monthly values. Dynamic scheduled generators included in Imports.
Solar	
Existing Solar	Total installed values from 2021 NQC list based on monthly values. Qualifying capacity based on effective load carrying capability for each month from D.19-06-026. For HE 8 p.m. PDT assumed generation is zero.
Incremental Solar	Based on CAISO confidential interconnection queue information. Only includes new resources with expected in-service date (ISD) prior to each month. Qualifying capacity based on effective load carrying capability for each month from D.19-06-026. For HE 8 p.m. PDT assumed generation is zero.

Wind	
Existing Wind	Total installed values from 2021 NQC list based on monthly values. Qualifying capacity based on effective load carrying capability for each month from D.19-06-026.
Incremental Wind	Based on CAISO confidential interconnection queue information. Only includes new resources with expected in-service date (ISD) prior to each month. Qualifying capacity based on effective load carrying capability for each month from D.19-06-026.
Other Renewables	
Other Renewables	Includes Biomass, Biogas, Geothermal, Heat recovery, Waste and Other. Qualifying capacity based on 2021 NQC list based on monthly values.
Battery	
Existing batteries	Total installed values from 2021 NQC list based on monthly values.
Incremental batteries	Based on CAISO confidential interconnection queue information. Only includes new resources with expected in-service date (ISD) prior to each month.
Demand Response	
Demand Response	Demand response is the sum of two data sources: (1) Total proxy demand response (PDR) from 2021 NQC list based on monthly values; and (2) CPUC credited historical 2020 investor owned utility demand response without PRM adjustment by month. This credit is assumed to approximate NQC capacity.
Imports (based on total maximum import capability of 10,805 MW)	
Contracted resource adequacy imports	Based on average of historical contracted imports from 2015 through 2020 for each month, which includes both drought and non-drought years. Includes Palo Verde and Hoover and dynamically scheduled resources. Average values are: June: 3,922 MW July: 5,340 MW August: 6,095 MW September: 5,921 MW October: 4,171 MW