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COMMISSION REPORT

Qualifying Capacity of Supply-Side Demand Response Working Group Interim Report

Gavin Newsom, Governor

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ABSTRACT

This report provides the California Energy Commission's (CEC) interim findings and recommendations from the CEC's working group on supply-side demand response to the California Public Utilities Commission (CPUC), as requested by the CPUC in Decision 21-06-029.

Demand response is the practice of providing customers with incentives to reduce or shift electricity use from peak demand periods. For purposes of this report, there are two primary categories of demand response: supply-side demand response and load-modifying demand response. Supply-side demand response resources are integrated into wholesale energy markets of the California Independent System Operator. Load-modifying demand response is typically driven by time-variant rates, and any associated load reduction is counted in reduced peak demand forecast. Only supply-side demand response, and not load-modifying demand response, is the subject of this report.

Demand response provides California with various benefits, including providing greater reliability to the grid and helping prevent outages. Improving the counting conventions for the qualifying capacity of supply-side demand response, which are values based on what the resource can produce during periods of peak electricity demand, may help demand response ensure reliability in California. This report recommends changes to the counting conventions for the qualifying capacity of supply-side demand response, specifically changes that can be implemented in 2022 to support resource adequacy for 2023. New counting options are recommended for the investor-owned utility and third-party demand response providers, including a backup option in case either new option cannot be implemented in the time available. The report also includes recommendations regarding a process going forward to develop permanent changes to the counting conventions for the qualifying capacity of supply-side demand response for 2024 and beyond.

Keywords: Supply-side demand response, resource adequacy, qualifying capacity, reliability

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EXECUTIVE SUMMARY

This report provides the California Energy Commission's (CEC) interim findings and recommendations from the CEC working group on supply-side demand response to the California Public Utilities Commission (CPUC), as requested in CPUC Decision 21-06-029.

Demand response provides California with benefits that include providing greater reliability to the grid and helping prevent outages. However, in recent years the California Independent System Operator (California ISO), CPUC, demand response providers and other stakeholders have identified issues with the methods and process used to calculate and assign qualifying capacity for demand response resources. These issues include the need to improve the counting conventions for the qualifying capacity of supply-side demand response to help demand response ensure reliability. The working group considered changes to the counting conventions for the qualifying capacity of supply-side demand response resources to better allow energy planners to rely on demand response resources.

These issues are intertwined with California's resource adequacy framework, which is a program administered by the CPUC and the California ISO to ensure that sufficient resource capacity is secured to support safe and reliable operation of the electricity grid.[1] Supply-side demand response operates within the resource adequacy program and is subject to the rules of that framework for calculating qualifying capacity, which are values based on what the resource can produce during peak electricity demand periods. In the case of a demand response resource, this is the amount of load reduction it can produce rather than an amount of generation as with a power plant. The working group considered changes to the counting conventions for the qualifying capacity of supply-side demand response resources.

For purposes of this report, there are two primary categories of demand response: supply-side demand response and load-modifying demand response. Of these two, only supply-side demand response is the focus of this report. Supply-side demand response resources are integrated into wholesale energy markets and can be called on to reduce demand when needed for economic or reliability reasons. In contrast, load-modifying demand response is typically driven by time-variant rates and any associated load reduction is counted in reduced peak demand forecast. Load-modifying demand response is not the subject of this report.

The report recommends changes to California counting conventions for the qualifying capacity of supply-side demand response, specifically changes that can be implemented in 2022 to support resource adequacy for 2023. New counting options are recommended for the investor-owned utility and third-party demand response providers, including a backup option in case either new option cannot be implemented in the time available. The report also includes findings and recommendations regarding a path forward to develop permanent changes to the counting conventions for the qualifying capacity of supply-side demand response for 2024 and beyond.

1 See https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/resource-adequacy-homepage.

CHAPTER 1: Introduction

Purpose and Scope

This report provides interim findings and recommendations from the California Energy Commission (CEC) stakeholder working group[2] on qualifying capacity of supply-side demand response to the California Public Utilities Commission (CPUC), as requested by the CPUC in Decision 21-06-029. While a permanent solution was originally intended to be devised for resource adequacy year 2023, incompatibilities between the CEC working group's timeline and that of related proceedings and processes precluded a permanent solution in this time frame, as discussed later in the report.[3] Therefore, the report scope focuses primarily on recommendations for qualifying capacity methods for the interim (resource adequacy year 2023). However, this report also includes findings and recommendations regarding a path forward to develop a permanent qualifying capacity method for resource adequacy year 2024 and beyond.

Importance of Demand Response

Demand response is increasingly important for utilities and wholesale market operators to balance electricity supply and demand, especially under critical grid conditions. Demand response can alleviate the stress on the electricity grid, reduce operational costs and greenhouse gas emissions, and play a critical role in ensuring grid reliability and price stability.

Customers of all types, from residential to commercial and industrial, can participate in demand response by reducing their electricity usage or shifting it to other times in the day. Although demand response is conventionally viewed as customers *decreasing* electricity usage, demand response can also help balance electricity supply and demand by *shifting* electricity usage to times when the grid has plentiful electricity generation from renewable resources like solar and wind.

Demand response increasingly holds the potential to provide California with economic and environmental benefits, including:

- Providing greater reliability to the grid and helping prevent rotating outages.
- Avoiding the purchase of high-priced energy.
- Avoiding the consumption of fossil fuels, which result in air quality issues and contribute to climate change.
- Aligning electric demand with renewable energy generation.
- Avoiding the over procurement of generation resources.

2 Please refer to Chapter 3 for more information on the stakeholder working group process.
3 Throughout this report, the term "resource adequacy year" is used to distinguish the year of compliance from the year in which specific planning actions and processes take place. For example, for resource adequacy year 2023, most compliance activities take place in 2022.

- Avoiding the construction of new generation and transmission infrastructure.

Taxonomy of Demand Response

Demand response programs in California are largely directed by the CPUC and administered by California's three regulated investor-owned utilities: Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric.[4] Independent commercial entities known as "third-party demand response providers" or "aggregators" also provide demand response services to investor-owned utilities and community choice aggregator customers.

Although there are many possible approaches to classifying demand response, one taxonomy divides demand response into two primary categories: dispatchable demand response and nondispatchable demand response.[5] For this report, dispatchable demand response is referred to as supply-side demand response and nondispatchable as load-modifying demand response. CPUC decisions in 2014 and 2015 split CPUC-jurisdictional demand response programs into supply-side demand response and load-modifying demand response. Supply-side demand response resources are designed to reduce demand when dispatched by the California ISO and are considered analogous to other "supply-side" generation resources like power plants. Only supply-side demand response, and not load-modifying demand response, is the subject of this report.

There are two types of California ISO-participating supply-side demand response resources: economic demand response, which bids into the market under normal operating conditions and is formally called a proxy demand resource, and emergency demand response, which is called upon only during supply-shortage conditions and is formally called a reliability demand response resource. Both types are dispatchable and counted for resource adequacy. Supply-side demand response resources are compensated for capacity by the load-serving entity and are compensated for energy by the California ISO if dispatched.

Economic demand response exists for investor-owned utility and CPUC jurisdictional third-party demand response providers.[6] Economic demand response is made up of various investor-owned utility demand response programs including air-conditioning cycling (typically operated as direct utility control of a customer air-conditioning system), capacity bidding program (typically operated as an aggregation of customer load reductions to respond to events), investor-owned utility local capacity requirement contracts, demand response auction

4 Demand response programs directed or administered by other local regulatory authorities, such as those operated by municipally owned utilities, are not the subject of this report.

5 Guernsey, Matt, Margo Everett, Bill Goetzler, Theo Kassuga, Nicole Reed Fry, and Rois Langner. May 11, 2021. *Incentive Mechanisms for Leveraging Demand Flexibility as a Grid Asset – An Implementation Guide for Utilities and Policymakers.* Prepared for National Renewable Energy Laboratory (NREL) by Guidehouse, Inc. May 11, 2021, https://www.energy.gov/sites/default/files/2021-06/GEB_Implementation_Guide_May_2021.pdf.

6 Electricity customers in California have the choice to participate in demand response programs provided by independent commercial entities, called "third-party demand response providers" or "aggregators." Third-party demand response providers include OhmConnect, Sunrun, Leapfrog Power, and CPower, among others.

mechanism (aggregated demand response bid directly into the California ISO market), and load-serving entity demand response resource adequacy contracts.

Demand response is unique among supply-side resources in the associated treatment as a resource adequacy resource. While some supply-side demand response resources are shown on supply plans, another larger portion is not and are instead treated through a process known as "crediting." Under crediting, the California ISO can count investor-owned utility demand response resources as a reduction in the amount of resource adequacy capacity required — that is, they are "credited" against the total demand instead of "shown" as resources to meet that demand. Investor-owned utility demand response program resources are credited, while the non-investor-owned utility demand response resources are shown as a contribution to resource adequacy requirements to the California ISO.

Reliability demand response resources consist of exclusively investor-owned utility demand response programs, including the base interruptible program and the agricultural and pumping interruptible program, both of which work directly with large customers to call on load reductions in emergencies. These reliability demand response resources can be triggered by the California ISO after a warning is declared. These programs are managed by the investor-owned utilities and are credited by the CPUC against the resource adequacy obligations of CPUC jurisdictional load-serving entities.

Load-modifying demand response is any program for demand flexibility not classified as supply-side demand response (that is, nondispatchable). Load-modifying demand response is typically driven by time-variant rates. Any associated load reduction is counted in reduced peak demand forecast. End-use customers are typically compensated via bill savings. Load-modifying demand response is not a subject of this report.

In terms of relative size, the amount of supply-side demand response far exceeds the amount of load-modifying demand response. The current CPUC jurisdictional demand response portfolio (as of 2021) consists of about 1,500 MW of supply-side demand response versus 85 MW of load-modifying demand response. A breakdown of this portfolio is provided in Table 1.

Table 1: August 2021 Demand Response Portfolio

Supply-Side Demand Response (~ 1500 Aug MWs)	Load-Modifying Demand Response

• Investor-owned utility managed demand response:
  ○ Emergency (804 Aug MW)
  ▪ Base Interruptible Program
  ▪ Agricultural & Pumping Interruptible Program
  ○ Economic (393 Aug MW)
  ▪ Capacity Bidding Program
  ▪ AC Cycling
  ▪ Local Capacity Requirement Contracts
• 3rd Party managed demand response:
  ○ Demand Response Auction Mechanism (206 Aug MW)
  ○ Community Choice Aggregator resource adequacy contracts (120 Aug MW)
	• Investor-owned utility managed demand response: (85 Aug MW)
	  ○ Permanent Load Shifting*
	  ○ Time of Use*
	  ○ Critical Peak Pricing
	  ○ Real Time Pricing
	
	* Load impact incorporated in reduced peak demand forecast

Source: California Public Utilities Commission

Demand Response and Reliability

Supply-side demand response can help utilities and the California ISO balance electricity supply and demand to maintain grid reliability, especially under critical grid conditions. Supply-side demand response is considered part of the supply stack (along with resources including solar, wind, energy storage, and natural gas-fired generation, among others) and is counted on to maintain reliability. As was noted in the Final Root Cause Analysis[7] of the August 14–15, 2020 (Root Cause Analysis) rotating outages, a significant portion of emergency demand response programs (that is, reliability demand response resources) provided load reductions when emergencies were called. Like other supply-side resources that support reliability, demand response resources operate within the resource adequacy framework and are subject to the accompanying rules for calculating qualifying capacity, described in the subsequent sections on resource adequacy and the qualifying capacity of demand response. However, the analysis conducted in the Root Cause Analysis pointed to questions about whether current qualifying capacity methods accurately capture the contribution of demand response to reliability. Some stakeholders raised arguments that demand response was undercounted, while others argued that it was overcounted.

7 Final Root Cause Analysis Mid-August 2020 Extreme Heat Wave. Prepared by the California ISO, CPUC, and CEC. January 13, 2021, http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf.

In response to the Root Cause Analysis, the CEC, California ISO, and CPUC took the following actions to begin to address the issue of supply side demand response and reliability:

- Demand response roundtable: The CEC, with the CPUC and the California ISO, hosted two roundtable discussions with demand response providers in the state. The roundtables were designed to understand the concerns providers have with conclusions in the Root Cause Analysis and how demand response programs are structured and obtain input on potential improvements. The demand response working group discussed in this report ultimately took up this effort.
- California ISO demand response program adjustments: Starting in the summer of 2021, the California ISO tested and adopted baseline methods using matched comparison groups and changes to the adjustment factors used in existing baseline calculations as permitted under the California ISO tariff. This process allowed a more accurate assessment of demand response load reduction during extreme events. The two baseline improvement tracks instituted for the summer included 1) exploring the use of comparison/control group method and 2) establishing a process and criteria for approved use of load adjustment factors outside of the min/max caps for summer 2021. The comparison group method has the potential for improving the accuracy of settlements for weather-sensitive resources but relies on nonparticipant usage data, the availability of which remains a barrier for widespread implementation.
- CPUC resource adequacy proceeding (Rulemaking 19-11-009): This proceeding considered several specific demand response-related issue areas identified in the Root Cause Analysis, including the issue of a better method for determining the qualifying capacity of demand response and the related issue of distribution and transmission loss factors associated with the current qualifying capacity approach.

Resource Adequacy

To ensure load-serving entities and the California ISO have the capacity to meet their reliability requirements, the CPUC and the California ISO jointly administer the resource adequacy program. California's resource adequacy program was implemented in 2006 and designed to ensure that load-serving entities secure sufficient resource capacity when and where needed to support safe and reliable operation of the California ISO grid.[8] The California ISO and local regulatory authorities establish system, local, and flexible capacity requirements for load-serving entities, and the load-serving entities in turn procure resource adequacy capacity through bilateral capacity contracts or their ownership or control of resources.

The CPUC sets and enforces the resource adequacy rules for its jurisdictional load-serving entities which include the investor-owned utilities, community choice aggregators, and electric service providers. Collectively, these jurisdictional entities represent 90 percent of the load within the California ISO service territory. Each October, CPUC-jurisdictional load-serving entities must submit filings to the CPUC's Energy Division demonstrating they have procured

8 Following the California Electricity Crisis in 2000–2001, the Legislature enacted Assembly Bill (AB) 380 (Núñez, Chapter 367, Statutes of 2005), which required the CPUC, in consultation with the California ISO, to establish resource adequacy requirements for CPUC jurisdictional load-serving entities.

90 percent of their system resource adequacy obligations for the five summer months (May–September) of the following year. Following this year-ahead filing, load-serving entities must demonstrate procurement of 100 percent of their system resource adequacy requirements on a month-ahead basis.

The scheduling coordinators for load-serving entities and the entities that supply resource adequacy capacity provide the California ISO with resource adequacy plans to demonstrate on an annual and monthly basis that they meet their resource adequacy requirements, and they are prepared to accept the California ISO tariff obligations of providing resource adequacy capacity.

The California ISO validates the resource adequacy plans to verify that load-serving entities have met their resource adequacy capacity. The California ISO notifies load-serving entities and suppliers of any deficiencies or inconsistencies. The California ISO can exercise its capacity procurement mechanism authority to backstop for any resource adequacy showing deficiencies and allocate the procurement costs to deficient load-serving entities.

Demand response is unique among supply-side resources. While some supply-side demand response resources are shown on supply plans, another larger portion is not and is instead treated through a process known as "crediting." Under crediting, the California ISO can count investor-owned utility implemented demand response resources as a reduction in the amount of resource adequacy capacity required — that is, they are "credited" against the total demand instead of "shown" as resources to meet that demand.

A credit is essentially an adjustment the local regulatory authority (e.g., the CPUC) has made to a load-serving entity's resource adequacy obligation, which can be neutral or decrease the obligation. Credits generally represent demand response programs and other programs that reduce load at peak times. The largest credited amount from a local regulatory authority is from the CPUC (for example, 1,482 MW for August 2020), which reflects the various supply-side demand response programs from the investor-owned utilities, including the emergency-triggered reliability demand response resources. Of this total credit, 1,472 MW reflects investor-owned utility emergency and economic demand response programs. Another 10 MW of credited demand response is attributed to non-investor-owned utility proxy demand resources. The non-investor-owned utility entities are CPUC jurisdictional third-party demand response providers.

For several years the California ISO has accommodated this practice whereby local regulatory authorities (such as the CPUC) provide proposed demand response to the California ISO for crediting before the resource adequacy showings process. The California ISO counts a local regulatory authority's credits when determining if a load-serving entity under that local regulatory authority's jurisdiction met its respective resource adequacy obligations. Crucially, these credited resource adequacy resources are not shown on supply plans and thus are not subject to the California ISO's tariff, which means they are not subject to the must-offer obligation (obligation to bid into the California ISO markets) and are not subject to the

resource adequacy availability incentive mechanism.[9] In December 2020, the California ISO sought to end this practice and require demand response resources to be shown on supply plans to provide greater assurance that these resources would be available to support reliability.

In contrast to demand response programs that are credited with contributions to reducing demand, the demand response capacity that is explicitly included on the supply plans of CPUC jurisdictional entities is much smaller. **Table 2** shows the total credited and shown demand response capacity for August 2020 for CPUC jurisdictional entities.

Table 2: August 2020 Credited and Shown Supply-Side Demand Response Resource Adequacy Capacity for CPUC Jurisdictional Entities

Demand Response Type	Implementer	Credited (MW)	Shown (MW)
Emergency (reliability demand response resources)	IOU	1,115	0
Economic (proxy demand resources)	IOU	358	0
Economic (proxy demand resources)	Non-IOU	10	243
Total		1,482	243

Source: *Final Root Cause Analysis Mid-August 2020 Extreme Heat Wave.* January 13, 2021.

There are differing perspectives on how the load reduction capability of supply-side demand response should be planned and counted. While the accounting system to measure the value of demand response has never been perfect, in part because it is hard to account for customers' actual behavior compared to their expected behavior, the extreme heat events in 2020 focused greater attention on the challenges with counting on and accounting for supply-side demand response. This renewed focus on the capacity value of demand response resulted in actions taken by the California ISO discussed in the following sections.

Existing Qualifying Capacity Process for Demand Response

To determine the capacity of each resource eligible to be counted toward meeting the CPUC's resource adequacy requirement, the CPUC develops qualifying capacity values based on what the resource can produce during peak electricity demand periods. The CPUC-adopted qualifying capacity counting conventions vary by resource type. For demand response, the qualifying capacity values are set based on historical performance using the load impact protocols, or LIP.

9 Through the RAAIM, the California ISO assesses nonavailability charges and provides availability incentive payments to resource adequacy resources based on whether the performance of these resources falls below or above, respectively, defined performance thresholds.

The load impact protocols were adopted by the CPUC in D.08-04-050 in 2008 and prescribe a set of guidelines for estimating the impact on load resulting from demand response activities. These guidelines established a consistent method for measuring actual historical performance of demand response resources and for forecasting anticipated future performance; however, it did not specify how load impacts should be applied for resource adequacy.

Demand response providers calculate resource capacity based on the expected load reduction capabilities of demand response resources under typical expected peak grid needs. In essence, the load impact protocols generate a model to estimate the load reduction of a demand response resource under varying conditions. This model might account for ambient temperature, day of the week, hour of the day, and month of the year, depending on the nature of the resources. To generate a qualifying capacity value, this model is applied to a set of conditions expected to reflect the peak grid need. These planning assumptions include the median peak temperature expected for each month on a weekday over the hours with the highest net demand. Demand response resources made of aggregations of small customers, such as residential "smart thermostat" programs, may be modeled as a demand reduction per customer, and the total capacity value is adjusted by the expected future participation.

Finally, the capacity value that gets adopted as the qualifying capacity for a given resource is provided by CPUC Energy Division staff. CPUC staff reviews load impact protocol reports with estimated capacity values and makes a "reasonableness determination" for each resource. For capacity values found unreasonable, CPUC staff may change assumptions regarding the expected load impacts or participation based on professional judgment. The resulting value is adopted as the qualifying capacity and represents the maximum capacity a demand response resource can provide in a resource adequacy capacity contract.

CHAPTER 2:
Context of Supply-Side Demand Response Qualifying Capacity Issues

The CPUC's Decision 21-06-029 requested the CEC establish a stakeholder working group process to address several interrelated issues regarding the qualifying capacity of supply-side demand response resources. To fully understand this request, a few pieces of additional context are required. This section summarizes each of these, starting with the California ISO proposed revision request 1280.

California ISO Proposed Revision Request 1280

On August 27, 2020, the California ISO submitted proposed revision request 1280 through its business practice manual change management process proposing revisions to its business practice manual for reliability requirements[10]. These revisions were intended to ensure that only capacity subject to the California ISO's resource adequacy tariff requirements count toward meeting the resource adequacy obligations of load-serving entities. That is, all supply-side demand response that counts toward a load-serving entity's resource adequacy requirements must appear on supply plans and be subject to the California ISO's tariff, including must-offer obligations.

Proposed revision request 1280 would have effectively ended the California ISO's accommodation of the crediting practice. Under this crediting practice, the CPUC provides load-serving entities with credits that reduce their resource adequacy obligations with demand response or similar resources that do not meet the normal California ISO tariff requirements and are not subject to the tariff's resource adequacy provisions. The proposed revisions would reject any credits that lower a resource adequacy requirement without the resource being shown on a California ISO supply plan and are not subject to the must-offer obligation. Implementation of proposed revision request 1280 would mean that demand response credits allocated to load-serving entities by the CPUC would no longer be accepted by California ISO.

Several stakeholders objected to proposed revision request 1280 during the California ISO business practice manual change management process and appealed proposed revision request 1280. On December 9, 2020, the California ISO Executive Appeals Committee issued a decision placing proposed revision request 1280 on hold to provide time for the California ISO and the CPUC to work collaboratively to resolve resource adequacy issues associated with supply-side demand response.

10 The California ISO business practice manual for reliability requirements may be found here: https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Reliability%20Requirements

CPUC Rulemaking 19-11-009

In November 2019, the CPUC opened Rulemaking 19-11-009 to oversee the resource adequacy program, consider changes and refinements to the program, and establish forward resource adequacy procurement obligations applicable to CPUC-jurisdictional load-serving entities beginning with the 2021 resource adequacy compliance year. This proceeding included the decision requesting the CEC convene a supply-side demand response qualifying capacity stakeholder process and began a process to restructure the resource adequacy program more broadly.

Decision 21-06-029

Decision 21-06-029 was issued in Rulemaking 19-11-009 on June 25, 2021, and is relevant to the subject of this report because it considered two topic areas associated with supply-side demand response: 1) reporting demand response resources on supply plans and 2) determining qualifying capacity of demand response resources. The latter topic area included the request for the CEC to launch a stakeholder working group process to develop recommendations on determining the qualifying capacity of demand response.

Demand Response on Supply Plans

In the Rulemaking 19-11-009 proceeding, the California ISO proposed to discontinue credits and require all resources counting as resource adequacy capacity to be shown on a California ISO supply plan based on the same arguments made in proposed revision request 1280 (discussed previously). The California ISO stated that unlike other resource adequacy resources, credited demand response resources are not shown on supply plans and not subject to California ISO tariff provisions, such as a must-offer obligation. The California ISO stated that these resources do not allow the California ISO to meet reliability needs and, if they fail to perform, are not subject to resource adequacy availability incentive mechanism charges.

CPUC Energy Division stated that it views demand response as a variable resource that should be treated as such in California ISO's system. In particular, they assert that demand response should be allowed to bid in different capacity amounts on different days and hours depending on operating conditions that affect load impact magnitude without exposure to resource adequacy availability incentive mechanism penalties. Energy Division proposed that investor-owned utilities be directed to move their demand response portfolios onto supply plans once the California ISO allows demand response to participate in its markets as a variable resource exempt from the resource adequacy availability incentive mechanism and demand response is permitted to bid variably. California ISO argued that adoption of an effective load carrying capability, or ELCC, method for demand response was a prerequisite for demand response to be exempt from the resource adequacy availability incentive mechanism.

In its decision, the CPUC was persuaded by parties' assertions that demand response is a variable resource with behavioral and weather-dependent characteristics and that demand response should be treated as such in California ISO's market. The CPUC stated that demand response should be permitted to bid different energy amounts associated with capacity on

different days and hours, depending on the operating conditions that affect the magnitude of load expected on a given day and hour.

Further, the CPUC did not agree with the California ISO that the resource adequacy availability incentive mechanism should apply to demand response resources. The CPUC found it unreasonable that demand response resources could be penalized through the resource adequacy availability incentive mechanism for bidding below the associated qualifying capacity value due to the conditions on a given day. The CPUC declined to adopt an effective load carrying capability based qualifying capacity method in the decision because of the lack of consensus from parties providing comments.

The CPUC concluded that once it confirms that California ISO permits demand response resources to bid variably in its markets and implements a Federal Energy Regulatory Commission-approved resource adequacy availability incentive mechanism exemption for demand response resources, each IOU will be directed to move its demand response portfolios onto California ISO supply plans.

Qualifying Capacity of Demand Response

In its filings in Rulemaking 19-11-009, the California ISO proposed that an effective load carrying capability method be used to determine the qualifying capacity of supply-side demand response, rather than a load impact protocols -based approach, because the California ISO believes that the load impact protocols-based approach overvalues the contribution of supply-side demand response to reliability. In support of its proposal, the California ISO cited an effective load carrying capability study prepared by Energy + Environmental Economics (E3) that analyzed 2019 bid data submitted by PG&E and SCE, subsequently updated with 2020 bid data, and found that the load impact protocols method valued demand response capacity contributions 19 to 23 percent more than the effective load carrying capability method.

The effective load carrying capability framework determines the equivalent quantity of "perfect capacity" (a hypothetical resource that can change output instantaneously and face no outages) that a variable or energy-limited resource provides over a year. The effective load carrying capability model inputs the capability profiles of demand response resources across all hours of the year, then runs electric reliability simulations over many years with varying weather conditions. The qualifying capacity of a resource is the capacity amount the resource contributes without increasing the probability of a forced outage. The California ISO has commented that the proliferation of intermittent and use-limited resources has required capacity counting methodologies to evolve to better capture the reliability contribution of certain resources, and that the CPUC updated its resource adequacy capacity valuation methodologies for wind and solar to use an effective load carrying capability approach.

Importantly, effective load carrying capability is designed to model the perfect capacity equivalent of a portfolio of resources, rather than individual resources. The effective load carrying capability of an individual resource changes depending on the other resources included in the resource mix and the sum of individual values will not sum to the total portfolio value. As a result, the final capacity values assigned to individual resources must be calibrated

to equal the portfolio value. This underappreciated final step can have significant impact on capacity values based on how the portfolio value is allocated to individual resources.

The California ISO effective load carrying capability proposal used aggregated demand response bids programs to generate the annual capability profile. Bids are a logical source of inputs for demand response availability because these bids form the basis for the California ISO to meet load in the operational space. Bids represent what the California ISO considers available for dispatch in energy markets even in cases where actual availability deviates from the bid; the California ISO can rely only on the amount bid. However, other parties identified problems with using bid data as inputs to an effective load carrying capability model, which led PG&E and SCE to develop an alternative effective load carrying capability, or ELCC, proposal.

PG&E and SCE's proposal, termed "load impact protocols-informed effective load carrying capability," or "LIP-informed ELCC," in this report[11], shares the reasoning behind effective load carrying capability; the significant difference is the use of modeled load impacts from the load impact protocols to generate the annual capability profile instead of bids. SCE submitted that such a method would sufficiently address the California ISO's concerns with the load impact protocols to enable it to revise its tariff to treat demand response as a variable resource. If the CPUC were to adopt this approach, PG&E recommended an exemption to the resource adequacy availability incentive mechanism, or RAAIM, for demand response on supply plans for 2022.

In the proceeding, some parties favored continued reliance on the load impact protocols-based approach, while others suggested that an effective load carrying capability approach be considered. The CPUC found that:

- Implementing a new interim effective load carrying capability approach for 2022 involved uncertainties and unanswered questions that must be addressed.
- The proposed method represents an abrupt change from the longstanding use of the load impact protocols.
- California ISO, SCE, and PG&E did not address how qualifying capacity for third-party and SDG&E demand response resources (those not included in the California ISO's original analysis) would be determined.

The CPUC concluded that there was an insufficient basis to adopt an effective load carrying capability method and declined to adopt any form of effective load carrying capability qualifying capacity method.

Rather than adopting a new qualifying capacity method for demand response in its decision, the CPUC instead opted to ask the CEC to launch a stakeholder working group process in the *2021 Integrated Energy Policy Report (IEPR)* and make "recommendations for a comprehensive and [measurement and verification] strategy, including a new capacity counting method for demand response addressing *ex post* and *ex ante* load impacts for

11 Originally called "load impact protocols plus effective load carrying capability," or "LIP + ELCC."

implementation as early as practicable. (35)" Specifically, the CPUC requested the CEC "make actionable recommendations" on the following issues:

1. Whether the California ISO's effective load carrying capability proposal is reasonable and appropriate to determine demand response qualifying capacity and what modifications, if any, should be considered.
2. "Whether the load impact protocols-informed effective load carrying capability proposal is reasonable and appropriate to determine demand response qualifying capacity and/or what modifications, if any, should be considered.
3. Whether other proposals that may be presented in the CEC's stakeholder process are reasonable and appropriate to determine demand response qualifying capacity.
4. Whether and to what extent alignment of demand response measurement and verification methods in the operational space for California ISO market settlement purposes with methods to determine resource adequacy qualifying capacity in the planning space should be achieved, and if so, how.
5. Whether, and if so what, enhancements to intracycle adjustments to demand response qualifying capacity during the resource adequacy compliance year, as adopted in D.20-06-031, are feasible and appropriate to account for variability in the demand response resource in the month-ahead and operational space.
6. Whether implementation of any elements of demand response qualifying capacity method modifications that might be adopted by the commission should be phased in over time.
7. Whether, and if so how, any changes to demand response adders should be reflected in demand response qualifying capacity methodology." (35–36).

In its decision, the CPUC requested the CEC to submit its recommendations for implementation in the 2023 resource adequacy year to the CPUC no later than March 18, 2022. The CPUC also requested, to the extent possible, that the CEC's recommendations include specific qualifying capacity values for consideration.

Decision 21-07-014

Decision 21-07-014, issued July 16, 2021, establishes a process and timeline for restructuring other aspects of the resource adequacy program within the CPUC proceeding. The decision adopts PG&E's "slice-of-day" proposal framework, with which the CEC's long-term demand response qualifying capacity method recommendations for resource adequacy year 2024 and beyond will need to be compatible.

PG&E's "slice-of-day" framework seeks to meet load in all hours of the day, not just during peak-demand hours. The proposal also seeks to ensure there is sufficient energy on the system to charge energy storage resources. The proposed framework would establish resource adequacy requirements for multiple slices of the day composed of one or more consecutive hours and across seasons composed of one or more months. The framework would establish a counting method to reflect the ability of a resource to produce energy during each respective slice.

The CPUC found that PG&E's slice-of-day proposal best addresses the concerns with the current resource adequacy framework and is best positioned to be implemented in 2023 for the 2024 compliance year. The decision directed parties to collaborate to develop a final restructuring proposal based on PG&E's slice-of-day proposal over at least five workshops through 2021 to early 2022 and develop a workshop report to be submitted into the resource adequacy proceeding in February 2022. The CPUC will consider the final proposed framework and intends to issue a decision in the third quarter of 2022 with details for implementation in 2023 for the 2024 resource adequacy compliance year.

CPUC Rulemaking 21-10-002

On October 11, 2021, the CPUC opened this proceeding to continue to address forward procurement obligations applicable to load-serving entities beginning with the 2023 resource adequacy year and consider broader structural reforms and refinements to the resource adequacy program. This rulemaking is intended to address the 2023 and 2024 resource adequacy years, as well as the local resource adequacy procurement obligations for the 2023–2026 compliance years. This rulemaking will also consider reforms and refinements to the resource adequacy program, including consideration of broader structural reforms. This proceeding is the successor to Rulemaking 19-11-009, which addressed these topics over the past two years. This proceeding is divided into an implementation track and a reform track. The implementation track is subdivided into phases 1, 2, and 3.

Assigned Commissioner's Scoping Memo and Ruling

On December 2, 2021, the assigned commissioner in this proceeding issued a scoping memo and ruling. As noted, this proceeding is divided into an implementation track (with phases 1, 2, and 3) and a reform track. The reform track encompasses consideration of a final proposed framework based on PG&E's "slice-of-day" proposal and the associated workshop report to be submitted into the resource adequacy proceeding in February 2022.

The issues within the scope of implementation track phase 2 includes qualifying capacity counting conventions — specifically, consideration of qualifying capacity proposals from the CEC's demand response working group report, as directed in Decision 21-06-029. The scoping memo and ruling established a schedule for implementation track phase 2.

The scoping memo and ruling notes that numerous parties commented that the CPUC should evaluate certain proposals in parallel or in a specific order — more specifically, that reform track proposals should be considered alongside or before certain implementation track proposals that may be affected, such as counting methods. The scoping memo and ruling recognize the benefit in aligning consideration of the reform track proposals and the CEC's working group report on the demand response qualifying capacity counting method, as directed in Decision 21-06-029. The scoping memo and ruling reiterates that Decision 21-06-029 directed a CEC working group report to be submitted into the resource adequacy proceeding by March 18, 2022. However, for the CPUC to consider the CEC's working group report in parallel with reform track proposals, the scoping memo, and ruling requests that the CEC submit its report into the resource adequacy proceeding in February 2022 rather than

March 2022. It is in response to this request that the CEC has accelerated the production of its working group report to enable its submittal to the CPUC in February.

CHAPTER 3:
CEC Stakeholder Process

In response to the June 2021 CPUC request in Decision 21-06-029, the CEC launched a stakeholder working group process in the *2021 IEPR* to make actionable recommendations on issues associated with the qualifying capacity of supply-side demand response. The request embedded in the decision called for "recommendations to the [CPUC] no later than March 18, 2022, as appropriate for implementation in the 2023 [resource adequacy] compliance year or thereafter" (78). The following summarizes the stakeholder process established by the CEC to respond to this request.

Staff Workshop Held on July 19, 2021

To launch the stakeholder working group process, the CEC held a staff workshop focused on qualifying capacity of supply-side demand response on July 19, 2021. The workshop was subsequently incorporated into the IEPR docket. This workshop served to publicly kick-off the stakeholder working group process requested by the CPUC. At this workshop CEC staff provided background on the CPUC's request and the CEC's plan to satisfy the request. CEC staff led a stakeholder discussion regarding the formation of one or more working groups and a workplan and schedule to satisfy the CPUC's request. CEC staff also announced the creation of a new CEC docket (Docket 21-DR-01) to compile meeting information and documents associated with the working group process.

Working Group Process

Immediately following the July 19 workshop, CEC staff formed two stakeholder working groups. One working group, called the "QC Methodology Working Group," was established to identify and define an array of methods for counting the qualifying capacity of supply-side demand response resources. The second working group, called the "Principles Working Group," sought to identify a set of principles that a qualifying capacity method should meet. Participation in both working groups was open to all interested stakeholders. The CEC publicly noticed the creation of an online form that let stakeholders indicate which working group they wanted to participate in and whether they would be interested in serving as a stakeholder lead of either working group. The response was positive, with most stakeholders opting to

participate in both working groups.[12] Two stakeholders volunteered and were selected as stakeholder leads for the two working groups.[13]

These two working groups began meeting August 2, 2021. Due to the limited amount of time available to respond to the CPUC request by March 2022, it was determined that the working groups would need to meet frequently. Thus, a working group meeting was held every Monday morning for two hours, with each working group meeting on alternate Mondays. Between August and October, each working group met five times. This frequency of working group sessions was successful and produced within just a few months an array of potential supply-side demand response capacity counting methods and a set of principles to evaluate the options. Based on this progress, CEC staff combined the two working groups in October 2021 into one working group to move to the next phase of effort. The new combined working group was named the "Supply-Side Demand Response Qualifying Capacity Working Group."

In October 2021, stakeholders communicated to CEC staff that due to timelines of other processes and proceedings, completing a permanent solution for resource adequacy year 2023 was infeasible. The qualifying capacity compliance schedule for resource adequacy year 2023 had already begun and the resource adequacy reform workshop process could significantly change the requirements of a demand response qualifying capacity method for resource adequacy year 2024. Accordingly, stakeholders noted any method adopted would likely be too late for implementation in resource adequacy year 2023 and incompatible for resource adequacy year 2024. In response, CEC staff suggested quickly developing interim recommendations (for resource adequacy year 2023 only) that could be adopted with minimal changes and moving the report deadline sooner.

To that end, in October 2021 the working group turned its focus to identifying interim options for the 2023 resource adequacy year. Over time, the working group coalesced on two interim proposals: load impact protocols informed effective load carrying capability, or LIP-informed ELCC, (originally termed load impact protocols plus effective load carrying capability, or LIP + ELCC) and an incentive-based approach modeled on other U.S. independent system operators or regional transmission operators such as PJM[14] and the New York ISO. The incentive-based "PJM/NYISO" approach was proposed by the California Energy + Demand Management Council (CEDMC). From that point forward the working group continued to discuss and focus

12 Stakeholder organizations represented include Sunrun, California ISO, Enel X North America, Recurve, Olivine, OhmConnect, CPUC Energy Division, CPUC Public Advocates Office, Hy Power Salton Sea, SCD Energy Solutions, Grounded Analytics, Southern California Edison, Pacific Gas and Electric, Barkovich & Yap, Inc. for the California Large Energy Consumers Association (CLECA), California Efficiency + Demand Management Council (CEDMC), CPower, SDG&E, Middle River Power, Leap, CalCCA, Powerflex, NRG Curtailment Solutions, Jay Luboff Consulting, Demand Side Analytics, Opinion Dynamics, California Energy Storage Alliance, Verdant Associates, Enchanted Rock, and EnergyHub.

13 Stefanie Wayland of Grounded Analytics volunteered and was selected as the stakeholder lead of the QC Methodology Working Group. Luke Tougas, a consultant on behalf of CEDMC, volunteered and was selected as the stakeholder lead of the Principles Working Group.

14 PJM is a regional transmission organization that coordinates the movement of wholesale electricity through all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

on these two proposals for resource adequacy year 2023. The working group met through January 10, 2022, the final working group meeting held before publishing this report for public comment.

IEPR Workshop Held on December 3, 2021

On December 3, 2021, an IEPR workshop was held on supply-side demand response and reliability. This IEPR workshop provided an opportunity to inform the IEPR record on the progress made in the CEC-led stakeholder working group process. This included reporting on the work completed, namely the types of methods proposed for counting the capacity of supply-side demand response resources and a set of principles for evaluating the proposed methodologies. The workshop included presentations on interim proposal options under development that could be implemented in 2022 for the 2023 resource adequacy year. Stakeholders expressed support for focusing the remainder of the stakeholder working group process on developing options that could be implemented in 2022 for the 2023 resource adequacy year.

Following the December 3 IEPR workshop, written comments were received from the California ISO, CEDMC, CLECA, PG&E, and SoCalGas, which are summarized below.

California ISO

The California ISO states in its comments that capacity valuation is a critical piece of the resource adequacy program. Moreover, to operate the grid reliably, California ISO 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. California ISO points out that the resource adequacy program was 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.

To support this assertion, the California ISO cites several examples, including that the CPUC updated its resource adequacy capacity valuation methods for wind and solar to use an effective load carrying capability approach. California ISO also cites as an example that the CPUC's integrated resource planning process applies effective load carrying capability to four-hour duration storage resources. As another example, California ISO states that effective load carrying capability has gained traction across the United States, and several ISOs, regional transmission organizations, and utilities already use, or are considering a transition to, effective load carrying capability for renewable energy and energy limited resources. California ISO notes that the counting method for demand response has not evolved to reflect these changing grid realities in California. The California ISO advocates for improvements in calculating demand response qualifying capacity in the resource adequacy program.

California ISO proposes that the load impact protocols informed effective load carrying capacity approach, or LIP-Informed ELCC, could be an option for both investor-owned utility and non-investor-owned utility third party demand response providers for resource adequacy year 2023. California ISO believes that using the LIP-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. The California ISO is hopeful that the LIP-informed ELCC method can be used to establish demand response qualifying capacity for the 2023 resource adequacy year and then be refined to inform program design in time for the investor-owned utility 2023–2027 program applications.

The California ISO does not support methods that measure resource capability without accounting for the contribution of demand response to reliability. Specifically, they do not support methods that do not account for the variable output, use limited, or availability limited nature or combination of demand response and the associated interactive effects with other use-limited resources. Based on this position, California ISO does not support the current load impact protocols based qualifying capacity method, nor does it support the CEDMC's interim proposal for the 2023 resource adequacy year.

California Efficiency + Demand Management Council

The California Efficiency + Demand Management Council (CEDMC), in written comments submitted to the CEC following the December 3, 2021, IEPR workshop on supply-side demand response and reliability, cited several concerns with the load impact protocols from a third-party demand response provider perspective. CEDMC asserts that since the CPUC directed third-party demand response providers to use the load impact protocols to determine their qualifying capacity values,[15] the load impact protocols are problematic for demand response providers for several reasons, creating barriers to third-party demand response participation in California. CEDMC cited four reasons to support this assertion:

1. The accuracy of the load impact protocols is questionable for more dynamic portfolios. Unlike investor-owned utility programs, demand response provider portfolios can significantly change from one year to the next because demand response providers have a financial interest in sizing their portfolios to meet market commitments and take advantage of market opportunities. Because of the uncertainty inherent in executing contracts, portfolios may differ widely from year to year, both in size and customer composition. In addition, the extended time frame of the load impact protocols process leads to performance data being used from up to two years prior to the resource adequacy delivery year.
2. The load impact protocols process lacks transparency and is very time-consuming. The load impact protocols entail a four-month process beginning in December with a final report due April 1 of each year. There is a two-year lag between the data used for load impact protocols analysis and qualifying capacity determination, and the resource adequacy delivery year. For example, the load impact protocol process that kicked off in December 2021 will use data from the 2021 resource adequacy year to derive qualifying capacity values for the 2023 resource adequacy delivery year. Following submission of the final load impact protocols report on April 1, it is then assessed by CPUC Energy

15 CPUC Decision 19-06-026 directed demand response providers to use the load impact protocols to determine qualifying capacity values beginning with the 2020 resource adequacy year.

Division over the following 3–5 months to determine the qualifying capacity values of these demand response resources.

3. The load impact protocols process is costly with no guarantee of cost recovery for third parties. The load impact protocols process requires extensive analysis and reporting, which requires the use of specialized consultants, which is very costly, even for comparatively small portfolios. Investor-owned utilities can recover these costs through their demand response program budgets, but demand response providers do not have that luxury. Therefore, this represents a significant investment that some demand response providers choose not to make without a reasonable expectation that they will recover these costs.
4. The requirement that consultants be used to perform the load impact protocols analysis acts as a bottleneck. There are a limited number of consultants able to perform the load impact protocols analysis, and, due to the intensive nature of this work, many consultants are limited in the number of investor-owned utilities and demand response providers they can take on. This limitation leads to many investor-owned utilities and demand response providers chasing a finite number of consultants, which can lead to demand response providers being frozen out of the load impact protocols process and, therefore, unable to sell their capacity.

CEDMC asserts that the CEC's overriding goal in its working group process should be to develop a demand response qualifying capacity method that works well for third-party demand response providers and investor-owned utilities while ensuring that demand response programs and resources are delivering value commensurate with their qualifying capacity values.

CEDMC believes that for third-party demand response to grow, a new approach is needed that will accurately reflect the capabilities of each demand response provider and investor-owned utility, be transparent in how a demand response portfolio qualifying capacity value is determined, incur a reasonable cost, and require little time to implement. CEDMC states that, at the very least, the CEC and stakeholders should ensure that the adopted approach is not *more cumbersome* than the existing process. CEDMC believes that future demand response growth will occur primarily through third parties, so a more streamlined demand response qualifying capacity method is needed that better suits the more dynamic nature of third-party demand response portfolios.

CEDMC believes that a new method should meet the following six principles: (1) reflect actual investor-owned utility and demand response provider capabilities based on the most current information possible, (2) minimize the time required to receive a qualifying capacity value from CPUC Energy Division, (3) be as transparent as possible, (4) minimize the cost to demand response providers, (5) avoid or minimize the need for outside consultants, and (6) reduce CPUC Energy Division workload to determine demand response qualifying capacity values.

CEDMC has proposed two methods for consideration: the "PJM/NYISO" incentive-based approach and the "streamlined load impact protocols," or "Streamlined LIPs," method. The PJM/NYISO method is CEDMC's preferred method in both the interim and long term because it

addresses almost all of CEDMC's six principles listed above. CEDMC states that the Streamlined LIPs method also addresses its six principles but believes it would require time and resources to develop as a long-term approach and thus is less suitable as an interim method. CEDMC's proposed PJM/NYISO method is discussed in more detail in a later section of this report. CEDMC supports allowing several new methods to be tested as interim measures for the 2023 resource adequacy year. CEDMC states that cultivating a competition of ideas in this area is preferable to approval of a method with no track record.

California Large Energy Consumers Association

In its written comments, the California Large Energy Consumers Association (CLECA)[16] is opposed to the California ISO position that providing an exemption to the resource adequacy availability incentive mechanism and allowing variable bids for demand response are only possible under an effective load carrying capability approach, including load impact protocols informed effective load carrying capability, or LIP-informed ELCC. CLECA argues that this LIP-informed ELCC method has not been fully developed and its results have not been vetted for reasonableness. CLECA believes effective load carrying capability modeling is complex and doubts that the LIP-informed ELCC modeling can be performed in time to have the results vetted and be usable for resource adequacy year 2023. CLECA points out that the resource adequacy timeline requires that resource adequacy showings by load-serving entities be made in October 2022 based on whatever resource adequacy value is assigned to resources under the adopted resource adequacy counting method at that point.

CLECA does not believe that the LIP-informed ELCC option is consistent with the slice-of-day method being developed for the resource adequacy year 2024.

Pacific Gas and Electric

PG&E states in its written comments that the idea of increasing the level of load-modifying demand response as compared to supply-side demand response is worth greater exploration. PG&E explains that this is in the context of not only the challenges both investor-owned utility and third-party demand response providers experience with supply-side demand response administration (that is, qualifying capacity measurement, supply plans, and dispatch), but also from the push for broader load flexibility. PG&E also believes that with the introduction of the nonmarket integrated pilot called the Emergency Load Reduction Program, it is clear that out-of-market resources can meaningfully support the grid.

PG&E believes that while market integration could be appropriate in certain cases such as economic demand response, it may be less appropriate in other cases such as emergency demand response and rate-based programs. Regarding the demand response auction mechanism, pilot, PG&E does not believe it is clear that demand response auction mechanism is the appropriate structure for procuring reliable resource adequacy from third-party demand response providers. For resource adequacy year 2023, PG&E supports a phased approach with optionality. As such, PG&E believes the current load impact protocols or the load impact

16 CLECA is an organization of large electricity customers located in California who all participate in the base interruptible program.

protocols informed effective load carrying capability method (LIP-informed ELCC) as an alternative option should be considered for 2023. PG&E believes that the LIP-informed ELCC option combines the benefits of the current load impact protocols with the enhancements of an effective load carrying capability framework advocated by the California ISO.

PG&E views the two valuation options proposed by CEDMC as inadequate and not implementable for resource adequacy year 2023. PG&E believes that proposals that trade off a more rigorous forecasting method with after-the-fact penalty structures are concerning, particularly as many of these penalty provisions have long feedback loops and lead to inconsistent counting of resources. PG&E argues that it is poor resource planning to remove upfront oversight because it would be too late to replace the resources if a large quantity of capacity was not available.

PG&E also comments that while it is not opposed to streamlining the load impact protocols, any modification would require thorough discussion and that the CPUC decision on load impact protocols modification would not be available in time for the year-ahead resource adequacy allocation for 2023. That is, PG&E believes that CEDMC's streamlined load impact protocols method is not a viable option for resource adequacy year 2023 but may be possible for resource adequacy year 2024 and beyond.

Lastly, PG&E believes that it may be difficult to reach full "consensus" among all stakeholders, as desired by the CPUC. PG&E notes that qualifying capacity counting methods have been considered in the resource adequacy proceeding since early 2020 and parties remain conflicted, despite a robust working group process. PG&E concludes that the CPUC may ultimately need to decide on a preferred option, based on input and data from the CEC and California ISO, to move forward with improved methods and avoid a "stalemate." To provide sufficient lead time for the 2023 resource adequacy process, such guidance from the CPUC should occur no later than the first quarter of 2022.

SoCalGas

SoCalGas comments that during the August 2020 blackouts, California ISO relied on demand response programs to curtail load more frequently and at higher levels than in nearly two decades. SoCalGas believes that from a system planning perspective, demand response bidding into resource adequacy should be discounted to ensure that California does not run short on capacity that could result in additional stresses to the electric system. SoCalGas suggests that the CEC, CPUC, and California ISO investigate how to ensure that higher percentages of enrolled demand response capacity materialize during the times of greatest need. SoCalGas believes data it provided in its comments suggest that there is limited assurance that demand response can be accounted for in long-term planning because it can fluctuate significantly from year to year. As such, SoCalGas recommends that the "reliance capacity" be discounted to account for uncertainty in demand response.

CHAPTER 4:
Findings

This section summarizes the findings made by CEC staff based on the working group process. These findings fall into the following categories:

1. Key Challenges for Qualifying Capacity Methods and Resource Adequacy Process of Demand Response Resources
2. Process and Timeline
3. Interim Proposal for Qualifying Capacity Methods in Resource Adequacy Year 2023

These findings are reviewed in additional detail in the following subsections.

Key Challenges for Qualifying Capacity Methods and Resource Adequacy Process of Demand Response Resources

CEC staff has identified five broad challenges to enabling a robust market for demand response capacity in California. These include:

1. **Crediting of investor-owned utility demand response resources:** California ISO has argued that the practice of crediting investor-owned utility demand response resources limits California ISO's ability to manage these resources to ensure reliability. These resources are not subject to the California ISO's tariff provisions, including the must-offer obligation and resource adequacy availability incentive mechanism in place to ensure resources contribute capacity when needed. While CEC staff recognizes that the current qualifying capacity counting method and incentive mechanism are not appropriate for all resource adequacy resources (see qualifying capacity method and incentive mechanisms below), CEC staff finds the argument credible that supply-side demand response resources should be considered part of the supply stack and treated accordingly. CEC staff believes moving all demand response resources onto supply plans will provide the California ISO with greater visibility and control over these resources in support of electric reliability.
2. **Qualifying capacity methodology:** The core request of the CPUC request that resulted in the CEC working group process was to develop "a new capacity counting methodology for [demand response]" (35). The decision also states that the *status quo* "[load impact protocols-based] approach is also a reliability-based [qualifying capacity] methodology," but acknowledges others may "be proven to be more accurate … in valuing a resource's contribution to system reliability" (38). CEC staff agrees that the load impact protocols-based approach is fundamentally intended to measure a contribution to reliability but finds that a more precise methodology is needed. As such, one primary goal of the working group is to develop a qualifying capacity method that better reflects the contributions of resources to reliability.
3. **Incentive mechanisms:** The California ISO resource adequacy availability incentive mechanism is a penalty structure in place to ensure supply-side resources are available

during the hours when the grid is most likely to need them. However, investor-owned utility demand response resources that are credited instead of shown on resource adequacy supply plans, as well as resources under 1 MW of capacity, are not subject to this provision of the California ISO tariff, leaving the majority of California's demand response capacity with no performance incentive from the perspective of the ISO. On the other hand, the resource adequacy availability incentive mechanism was developed for traditional dispatchable, constant-output resources such as natural gas power plants. CPUC Energy Division staff has suggested "California ISO find an alternate mechanism to hold [demand response] bidders accountable" for performance (28–29). Similarly, the California ISO's Department of Market Monitoring recommended "developing a performance penalty or incentive structure for resource adequacy [demand response] resources."[17] CEC staff finds these recommendations persuasive and agrees that the current incentive structure is inappropriate and insufficient for demand response capacity needed to contribute to grid reliability.

4. **Settlement Baselines:** A key motivator for California ISO's proposed revision request 1280 was the performance of investor-owned utility demand response resources during California's rotating outages of August 14 and 15, 2020. California ISO found that investor-owned utility resources both bid less than their qualifying capacity in aggregate and the measured performance was even lower and characterized this behavior as "underperformance." However, the approved settlement baseline methods used to estimate load impacts at that time did not include appropriate methods for weather-sensitive demand response resources, such as air-conditioning cycling programs. CEC staff finds that without accurate baseline methods, it cannot be known whether these demand response resources underperformed relative to the associated operational (energy) or planning (capacity) commitments. However, accurate measurement of actual load impacts is a foundational requirement for valuing a contribution to reliability, so CEC staff finds accurate settlement baselines requisite to any capacity counting method. CEC staff notes that the California ISO has since adopted a "control group" (more precisely called a "comparison group") baseline method for such resources. The new baseline has the potential to address the settlement challenge sufficiently, but it must be successfully implemented to do so.
5. **Process:** Stakeholders have communicated to staff that the load impact protocols and qualifying capacity assignment process are unreasonably expensive, onerous, opaque, and inflexible. Completion of the load impact protocols typically requires an evaluation consultant to complete many load impact protocols reporting requirements, many of which are not strictly necessary for calculating the qualifying capacity value, adding expense. The load impact protocols process for a given resource adequacy year begins more than one year in advance with the submittal of load impact protocols evaluation plans with data from the previous year, rendering the input data out of date relative to

17 California ISO Department of Market Monitoring. *Demand Response Issues and Performance.* February 25, 2021. http://www.California ISO.com/Documents/ReportonDemandResponseIssuesandPerformance-Feb252021.pdf. Page 30.

actual compliance year. The actual assignment of qualifying capacity is finalized by CPUC Energy Division staff, who reviews and amends qualifying capacity based on professional judgment, but no published guidelines exist for how such amendments are made. Finally, because of the annual cycle for calculating and approving qualifying capacity values, there is little opportunity to change qualifying capacity values based on factors such as enrollment. These interrelated issues suggest that the qualifying capacity process could be preventing new demand response resources from being deployed and qualified, so California is not able to benefit from such potential new resources. CEC staff finds that there is significant room for improvement in the cost, ease, transparency, and flexibility in the demand response qualifying capacity process, allowing new resources to come on-line flexibly as needed.

Addressing any subset of these issues can significantly improve the market for demand response capacity and the role it plays in California's electric reliability, GHG emissions reductions, and cost management. However, to make the most of supply-side demand response in California, CEC staff finds that all five barriers must be addressed holistically.

Process and Timeline

Although the initial focus of the effort was the development of a March 2022 recommendation for a permanent replacement qualifying capacity method that could be implemented as early as resource adequacy year 2023, in mid-October 2021 CEC staff and working group members determined that devising a permanent solution would not be feasible on the original schedule.

First, the schedule called for a report with recommendations for a permanent method by March 2022, allowing the CPUC to reach a decision on these recommendations by June 2022. Load impact protocols evaluation plans were already due by the end of 2021 and draft load impact protocols reports are due to the CPUC by mid-March 2022. Stakeholders communicated that demand response providers would have to either incur significant expense to complete the unnecessary load impact protocols process or risk not completing the process only to find it required for resource adequacy year 2023 if the CPUC did not adopt the recommendations.

Second, stakeholders communicated that the CEC working group needed to make an informed recommendation consistent with the outcome of CPUC's working group for restructuring the resource adequacy program under a "slice-of-day" framework (from D.21-07-014). Given that the report is expected in February 2022 (and the CPUC is expected to decide whether to adopt in the third quarter of 2022), the CEC working group does not have all the information required to make a recommendation on qualifying capacity counting method at this time that would be aligned with a slice-of-day approach.

Finally, given the five challenges identified in the CEC working group (see previous subsection), CEC staff concluded that submittal of recommendations by March 2022 for a permanent replacement qualifying capacity method does not allow sufficient time for a well-thought-out comprehensive solution for the long term. More time is needed to develop a new approach that meets near- and longer-term program objectives.

Together, these factors suggested that working toward a permanent solution beginning in resource adequacy year 2023 is not possible. However, CEC staff found that some of the proposals can address subsets of the previously identified challenges in ways that can materially contribute to California's electric system reliability in 2023. Even so, the amount of time to adopt interim methodologies is limited, and there is unavoidable risk with attempting to implement a new methodology by resource adequacy year 2023. CEC found that given the timeline of the load impact protocols process for resource adequacy year 2023, it is reasonable to allow all demand response providers to qualify their capacity using the *status quo* load impact protocols process. Additional time and effort will be required to develop a permanent approach for resource adequacy year 2024 and beyond.

The authors of this report note that CEC staff has served in a collaborative or advisory role with CPUC staff in all previous resource adequacy proceedings. Starting several years ago, CPUC decisions have designated CEC as collaborative staff (that is, acting in an advisory capacity). The authors note that CEC staff can continue in these capacities to help promote the implementation of interim solutions.

In summary, one or more interim solutions are needed for resource adequacy year 2023 to address key challenges to procurement of demand response capacity and allow time for a more comprehensive determination of a long-term solution for 2024 and beyond. CEC staff may support the effort to implement the interim qualifying capacity process.

Interim Proposal for Qualifying Capacity Methods in Resource Adequacy Year 2023

While it is infeasible to adopt a permanent qualifying capacity method for resource adequacy year 2023, CEC staff finds that PG&E's load impact protocols informed effective load carrying capability proposal or "LIP-informed ELCC" and CEDMC's incentive-based or "PJM/NYISO" approach each materially address a subset of the challenges to optimizing the role of demand response in capacity procurement and have been discussed extensively with the working group members. CLECA's loss of load probability-weighted load impact protocol or "LOLP-weighted LIP" also has potential to incrementally improve measuring a contribution to reliability. CEC staff finds that, for the same reasons there is insufficient time to select a permanent solution, there is insufficient time to develop stakeholder consensus on significant changes to interim methodologies.

CEC staff cautions that these interim options for the 2023 resource adequacy year should not set any precedent relative to long-term consideration of methods for the 2024 resource adequacy year; the interim options should not be construed to be stronger permanent qualifying capacity methodologies simply because they were recommended in the interim. The three methodologies included in this report and the key challenges addressed by each are summarized in Table 3. Write-ups on each of the proposals are attached to this report.

Table 3: Interim Proposals and Key Challenges Addressed

Methodology	Provider Type	Crediting	Qualifying Capacity Method	Incentive Mechanisms	Settlements	Process
LIP-Informed ELCC	IOU	X	X			
Incentive-based	Third-Party			X		X
LOLP-weighted LIP	Backup		X			

Source: CEC Analysis

Load Impact Protocols-Informed Effective Load Carrying Capability

The California ISO initially proposed an effective load carrying capability method for counting demand response capacity. The California ISO 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
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.[18]

The California ISO believes that the effective load carrying capability method best meets these principles and supports effective load carrying capability as the preferred resource adequacy counting method for demand response resources with limited availability or output. California ISO believes that effective load carrying capability best captures demand response resource reliability contributions and interactive effects with other resources on the system.

However, California ISO's initial proposal used bid data to characterize the hourly capacity availability of demand response over the course of a year. CEC found that bid data were not a reliable measurement of availability because of the issues with baseline methods for weather-sensitive resources. As such, the original bid-informed effective load carrying capability was ruled out as an interim method candidate.

PG&E and SCE initially proposed a variation of effective load carrying capability called the load impact protocols informed effective load carrying capability. The "LIP-informed ELCC" proposal

18 *CAISO Comments – Supply Side Demand Response Workshop.* California Independent System Operator Corporation. December 17, 2021. http://www.caiso.com/Documents/Dec17-2021-Comments_Supply-SideDemandResponseWorkshop_21-IEPR-04.pdf.

(originally termed "LIP + ELCC") applies the same logic and principles as the bid-informed effective load carrying capability. The main difference is that the inputs to the effective load carrying capability model are the outputs from the load impact protocols (that is, the load impact protocols profile) rather than bid information.

Since ruling out the bid-informed effective load carrying capability, California ISO supports a LIP-informed effective load carrying capability approach as the preferred counting method for demand response resources for resource adequacy year 2023. California ISO notes that this approach meets the California ISO's principles to support an exemption from the resource adequacy availability incentive mechanism. The California ISO has developed a process guide to facilitate the CPUC Energy Division staff's modeling of demand response effective load carrying capability (see attached write-up provided by California ISO).[19] The California ISO believes that this effort will leverage the CPUC's existing modeling tool SERVM, which it currently uses to develop effective load carrying capability values for the resource adequacy program and in its integrated resource planning proceeding.

CEC staff finds that an effective load carrying capability-based approach meets the principles stated by the California ISO and adopting this method should better reflect the contribution of demand response to reliability. Because the California ISO has indicated it would support an exemption to the resource adequacy availability incentive mechanism under an effective load carrying capability-based approach, adopting this method would also address the issue of crediting investor-owned utility demand response resources. However, the LIP-informed ELCC approach does not provide any performance incentives and adds to the process by requiring the step of developing a load impact protocol profiles for input into the effective load carrying capability model. CEC staff acknowledges the technical and timing risk related to implementing the effective load carrying capability modeling in the amount of time available and that a contingency plan, in the event that LIP-informed ELCC results cannot be produced in the time permitted, would help reduce this risk. As described later in the discussion of optionality, CLECA's LOLP-weighted LIP proposal is offered as a back-up for the CPUC to evaluate in the event of this contingency.

Incentive-Based "PJM/NYISO" Approach

CEDMC proposed an incentive-based approach modeled in part on those of other U.S. independent system operators such as PJM and NYISO (see attached write-up provided by CEDMC).[20] Under an incentive-based approach, demand response providers estimate the capability of their resources and claim a corresponding capacity value. Unlike other proposals and the *status quo*, which require significant upfront oversight in estimating future capacity, the incentive-based approach employs incentive mechanisms — namely financial penalties for underperformance — to ensure compliance. Because the penalty mechanism

19 *DR ELCC Guide: Using LIP-Informed Profiles to Calculate DR ELCC in SERVM*, prepared by Energy + Environmental Economics for the California ISO, January 19, 2021. This guide can be found in CEC Docket 21-DR-01 at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-DR-01

20 A CEDMC provided document entitled, *California Efficiency + Demand Management Council Interim DR Qualifying Capacity Methodology* Proposal, describes their proposal and can be found in the CEC Docket 21-DR-01 at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-DR-01.

provides an incentive to forecast accurately, demand response providers may use any proprietary analytical tools they choose to determine their qualifying capacity values.

However, the incentive-based approach proposed by CEDMC essentially adopts the same counting method for *ex post* evaluation as the load impact protocols process uses for *ex ante* qualifying capacity valuation. As noted, CEC staff finds the capacity counting method to be a rough approximation for contribution to reliability and improving the method to be a central component of the request from the CPUC.

Finally, the proposed incentive schedule may not be sufficient to ensure the desired level of performance for demand response resources. The proposed schedule is based on PG&E's capacity bidding program, under which providers face a penalty only if providers deliver less than 75 percent of the contracted amount. CEDMC presented an alternative penalty structure earlier in the working group process based on the demand response auction mechanism, under which penalties begin at 90 percent of contracted capacity but is less severe at lower levels of performance. The demand response auction mechanism itself has seen underperformance over the course of the pilot program, suggesting stronger penalties may be needed to ensure demand response providers are able to meet capacity commitments.

The CEC finds a penalty schedule made from a hybrid of the two options reasonable. Under this structure, which is summarized in Table 4, a provider would be compensated at the demonstrated capacity of their resources minus the penalty. For example, a resource that contracts 100 megawatts but demonstrates only 80 megawatts would be compensated for 80 megawatts less 10 percent of the demonstrated capacity (8 megawatts), for a total of 72 megawatts.

Table 4. Hybrid Penalty Structure for Incentive-Based Proposal

Demonstrated Capacity as Percentage of Contracted Capacity	**Penalty**
>90%	None
>75–90%	10% of demonstrated capacity
>60–75%	50% of demonstrated capacity
≤60%	60% of demonstrated capacity

Source: CEC Modification of CEDMC Proposal.

However, CEC staff acknowledges that there are technical and timing risks related to implementing the incentive-based approach in the amount of time available. CPUC staff have communicated that implementing the approach would require new structures and processes for collecting collateral, assessing *ex post* performance, and collecting penalty payments.

These would require staffing and other resources that may not be possible to set up in time for the 2023 resource adequacy compliance year. A contingency plan, in the event that the incentive-based approach cannot be implemented in the time permitted, would help reduce this risk. As described later in the discussion of optionality, CLECA's LOLP-weighted LIP proposal is offered as a back-up for the CPUC to evaluate in the event of this contingency.

CEC staff nonetheless recognizes that California may be in danger of a capacity shortfall in the near term, and energy system planners have called for more capacity in the coming years.[21] While possibly imperfect, CEC staff views the incentive-based approach as one that could allow more demand response capacity to materialize in a relatively short time frame.

Loss of Load Probability-Weighted Load Impact Protocols

CLECA proposed a methodology that uses relative loss of load probabilities as hourly weights to apply to the load impact protocols rather than a simple average. This proposal, originally termed "load impact protocols informed by loss of load expectation" or LIP informed by LOLE, is referred to as Loss of Load Probability-Weighted Load Impact Protocols in this report, or "LOLP-Weighted LIP" for short (see attached write-up provided by CLECA).[22] Fundamentally, this proposal acknowledges the difference in the contribution to reliability of load impacts made in different hours by weighting those impacts by the relative likelihood of loss of load events. In this sense, the LOLP-Weighted LIP is an incremental improvement to reflecting contribution to reliability relative to unweighted load impact protocol results.

However, the reliance on a loss of load expectation study presents many of the same challenges and pitfalls as the LIP-Informed ELCC, including sensitivity to the assumptions made. For example, in one example loss of load study cited in the proposal, nearly 97 percent of loss of load events occurred in September; in another, loss of load events occurred fairly frequently in both July and September, but fewer than 3 percent occurred in August. In reality, loss of load events are unlikely to be concentrated almost exclusively in a single month or that a month with few expected loss of load events would fall between two months with many. To handle this, CLECA proposes averaging the hourly loss of load probabilities over June–September. Such averaging reduces the resolution of the LOLP weights. For example, net peak tends to occur much later in the evening in June than in September because of the longer days extend solar generation hours. That is, the same weights are likely not appropriate for both June and September, yet the resolution of loss of load models shown is insufficient to develop appropriately granular LOLP weights.

CEC staff recognizes that the LOLP-weighted LIP proposal does present an incremental improvement to valuing the contribution to reliability of demand response. CEC staff finds the LOLP-weighted LIP proposal suitable as a backup option in the event that either the LIP-informed ELCC or incentive-based approach cannot be implemented in the amount of time

21 Gill, Liz, Mark Kootstra, Elizabeth Huber, Brett Fooks, and Chris McLean. 2021. *Midterm Reliability Analysis*. California Energy Commission. Publication Number: CEC-200-2021-009.

22 CLECA Alternative LIP+LOLE Approach Proposal, updated January 17, 2022. This document can be found in CEC Docket 21-DR-01 at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-DR-01

available. However, the LOLP-weighted LIP proposal is unlikely to precipitate the move of investor-owned utility demand response resources to supply plans because it has not yet been shown to satisfy the requirements for an exemption from the resource adequacy availability incentive mechanism.

Optionality

CEC staff has found that given the status of the load impact protocols and qualifying capacity process for resource adequacy year 2023, it is not reasonable to require demand response providers to adopt one of the proposed new methods. This finding implies demand response providers must have the option to use the *status quo* load impact protocols methodology for resource adequacy year 2023.

In addition to the *status quo* methodology, CEC staff finds the LIP-informed ELCC appropriate for investor-owned utility resources and the incentive-based approach appropriate for third-party providers. These proposals each address an acute problem for the corresponding demand response provider type (crediting and process-related barriers to participation, respectively). While CEC staff generally prefers neutral market rules that allow all providers to select from all possible methodologies, time and resource constraints make this arrangement infeasible in the interim. In particular, CEC staff recognize that the LIP-informed ELCC methodology requires significant amounts of additional analysis. Both CPUC and California ISO staff have communicated that it is unlikely that CPUC Energy Division staff will have the bandwidth to perform ELCC modeling for the third-party demand response providers which makes that option likely unavailable to them. Accordingly, CEC staff finds it is reasonable to limit investor-owned utilities to the LIP-informed ELCC and third-party demand response providers to the PJM/NYISO methodology (in addition to the *status quo*). There may also be implementation difficulties associated with the incentive-based approach because of the need to deploy a new penalty structure in the amount of time available. CEC staff also finds it is reasonable to offer the LOLP-weighted LIP proposal as a back-up for both options in the event of implementation difficulties (e.g., that in the case of LIP-informed ELCC the CPUC Energy Division staff are unable to carry out the ELCC modeling or that the CPUC deems its results unreasonable or, in the case of the incentive-based approach, a new penalty structure cannot be deployed in time).

Optionality provides an opportunity to test new methods, particularly the LIP-informed ELCC, without committing to the results beforehand. The investor-owned utilities that participated with the California ISO and E3 in the prior study of bid-informed effective load carrying capability have the benefit of some experience with the effective load carrying capability method. However, the methodology has not been implemented for demand response in a regulatory setting, so it is reasonable to allow the utilities to see the results before committing to them.

The expected exemption to the resource adequacy availability incentive mechanism provided by the LIP-informed ELCC method allows previously credited investor-owned utility demand response resources to be shown on supply plans without being subject to penalty. Subject to the adoption of this compliance pathway, CEC staff finds the California ISO's proposal to

require all resource adequacy capacity to be shown on supply plans and subject to the California ISO's resource adequacy tariff provisions to be reasonable. Therefore, demand response capacity qualified through the load impact protocols process can also be required to be subject to the resource adequacy tariff provisions (including the must-offer obligation and the resource adequacy availability incentive mechanism).

CHAPTER 5: Recommendations

CEC staff recommends that the working group effort to develop options and address the issues regarding supply-side demand response qualifying capacity be split into two tracks:

A. **Interim track:** Focus on developing options for resource adequacy year 2023 that address key challenges to deploying and relying upon supply-side demand response capacity in ways that materially contribute to California's near-term electric reliability. If a permanent resource adequacy framework is not adopted in 2022, CEC staff will issue additional interim recommendations for resource adequacy year 2024.
B. **Long-term track:** Consider the complete list of issues in the CPUC request and identified during the working group process and focus on developing a comprehensive, thoroughly vetted, and permanent solution for resource adequacy year 2024 and thereafter that aligns with potential structural reforms to the resource adequacy framework (particularly the forthcoming slice-of-day approach).

Specific recommendations for each track follow.

Interim Track

For resource adequacy year 2023 only, CEC staff make the following recommendations to the CPUC:

1. **Adopt the LIP-informed ELCC proposed by PG&E and the California ISO for the investor-owned utilities.** The LIP-informed ELCC method more accurately accounts for a contribution to reliability than the *status quo*. This method will allow the California ISO to grant an exemption to the resource adequacy availability incentive mechanism for investor-owned utility demand response resources and for the CPUC to direct investor-owned utilities to move their demand response resources onto supply plans.
2. **Adopt the incentive-based approach proposed by CEDMC for third-party providers.** The incentive-based or "PJM/NYISO" approach may allow third-party demand response providers to bring new resources online quickly and these providers should be given the opportunity to demonstrate how this approach can accelerate demand response deployment. The incentive-based penalty approach is more appropriate for demand response resources than the resource adequacy availability incentive mechanism. Apply the modified penalty structure detailed in Table 4.
3. **Allow optionality between the LIP-based *status quo* and the above interim methodologies.** There is insufficient time to require demand response providers to adopt a new method for resource adequacy year 2023, so the *status quo* should remain an option for all providers. Because it appears infeasible for CPUC Energy Division staff to perform ELCC modeling for all demand response resources, the LIP-informed ELCC is recommended as an option for investor-owned utility demand response only. Conversely, because the incentive-based approach proposed by CEDMC

would not qualify for an exemption from the resource adequacy availability incentive mechanism, it is offered only to third-party providers. Optionality should enable a demand response provider to participate in testing the applicable method before committing to the results. For consistency with the resource adequacy process, CEC staff recommends that investor-owned utilities and third-party demand response providers should be required to commit to a methodology and its results by July 1, 2022.

4. **Adopt the LOLP-weighted LIP proposal as a backup to both the LIP-informed ELCC option and the incentive-based approach option**. In the event that CPUC Energy Division staff are unable to perform the modeling necessary to implement the LIP-informed ELCC approach, or if a new penalty structure cannot be deployed in the case of the incentive-based approach, allow CLECA's LOLP-weighted LIP proposal to be used. This proposal requires minimal additional work on the part of DR providers, LIP consultants, or CPUC Energy Division staff and will provide incremental improvements to valuing the contribution to reliability of demand response.
5. **Request that the California ISO grant an exemption to the resource adequacy availability incentive mechanism for LIP-informed ELCC.** The LIP-informed ELCC meets the California ISO's requirements to file for a tariff amendment with the Federal Energy Regulatory Commission to grant an exemption to the resource adequacy availability incentive mechanism for demand response resources that choose to use it. The California ISO should file its tariff amendment and grant exemptions accordingly.
6. **Direct investor-owned utilities to move their demand response portfolios onto supply plans.** Because the LIP-informed ELCC method satisfies the requirements above, the investor-owned utilities may now move their resources onto supply plans without exposure to the resource adequacy availability incentive mechanism. However, in the event the CPUC finds that LIP-informed ELCC values cannot be satisfactorily determined in time to meet resource adequacy process milestones, the CPUC should retain the prerogative until August 1, 2022, to grant credits for investor-owned utility demand response resources in 2023. In this circumstance, the CPUC may allow resources previously committed to using LIP-informed ELCC to be reverted to the *status quo* or the LOLP-weighted LIP proposal and provide credits for IOU programs.
7. **Consider LIP-informed ELCC and incentive-based approaches as non-precedent setting recommendations.** Recommendation of these methods in the interim should not be construed as tacit support or endorsement for these methods in the long term; all interim methods should be on the table as candidates for consideration as a long-term solution, along with others not discussed in this report. Both methods proposed for the interim improve aspects of the market for demand response capacity, but neither is perfect and neither has had sufficient opportunity to be amended through the working group. Furthermore, the two interim methods vary greatly in their approach, and the CEC does not recommend maintaining such differing approaches in the long-term. Finally, the forthcoming decision regarding slice-of-day should inform the long-term method. In the event the LOLP-weighted LIP proposal is

implemented as a backup to either option, it too should not be precedent setting. If a slice-of-day framework is not adopted for resource adequacy year 2024, then the CEC will issue additional interim recommendations as necessary.

8. **Leverage CEC staff to support qualifying capacity counting for resource adequacy year 2023.** CEC staff should continue to serve in a collaborative or advisory role with CPUC staff in the resource adequacy proceeding to help facilitate the deployment and implementation of the recommended interim solutions.

Long-term: Resource Adequacy Year 2024 and thereafter

For resource adequacy year 2024 and thereafter, CEC staff recommend the following:

9. **Extend the CEC supply-side demand response working group beyond February 2022.** Allow the CEC-led working group process to continue into the third quarter of 2022 to develop recommendations for resource adequacy year 2024 and thereafter. Request the CEC produce a final report by the fourth quarter of 2022.
10. **Expand the scope of the supply-side demand response working group to address the five challenges identified in the CEC working group process.** The CPUC request for the CEC focused on the qualifying capacity method (which was tied closely to the practice of crediting investor-owned utility demand response resources). However, the CEC working group process revealed other interrelated challenges facing demand response participation in capacity procurement. CEC staff believe that crediting, the qualifying capacity method, incentive mechanisms, settlements, and process must be addressed holistically to develop a robust market for demand response capacity. CEC staff note that the issue with settlements may have been addressed through the control group baseline method but recommend the working group monitor its implementation and make sure the new method is working as anticipated.
11. **Continue collaboration with CEC staff on qualifying capacity counting implementation in the long term.** CEC staff should continue to serve in a collaborative or advisory role with CPUC staff in the resource adequacy proceeding to help facilitate the deployment and implementation of the recommended long-term solution. Leverage CEC analytical capabilities and energy data warehouse to support demand response performance measurement and verification and qualifying capacity calculation as appropriate.

GLOSSARY

AGRICULTURAL AND PUMPING INTERRUPTIBLE PROGRAM – An investor-owned utility demand response program that temporarily interrupts electric service to participating customers during periods of peak energy demand.

BASE INTERRUPTIBLE PROGRAM – An investor-owned utility demand response program that temporarily reduces the load of participating customers when the California ISO issues a curtailment notice.

BUSINESS PRACTICE MANUAL – A collection of California ISO documents that contain the rules, policies, procedures, and guidelines established by the California ISO.

CAPACITY BIDDING PROGRAM – An investor-owned utility demand response program that is managed by third-party aggregators responsible for designing their own demand response program as well as customer acquisition, marketing sales, retention, support, and event notification tactics.

CAPACITY PROCUREMENT MECHANISM – Capacity procured by the California ISO to address a deficiency in Resource Adequacy capacity.

COMMUNITY CHOICE AGGREGRATOR – Cities and counties that buy or generate electricity for residents and businesses within their communities.

CALIFORNIA ENERGY + DEMAND MANAGEMENT COUNCIL – A statewide trade association of non-utility companies that provide energy efficiency, demand response and data analytics products and services in California.

CALIFORNIA LARGE ENERGY CONSUMERS ASSOCIATION – An organization of large electricity customers located in California who all participate in the Base Interruptible Program.

DEMAND RESPONSE – Providing wholesale and retail electricity customers with the ability to choose to respond to time-based prices and other incentives by reducing or shifting electricity use, particularly during peak demand periods, so that changes in customer demand become a viable option for addressing pricing, system operations and reliability, infrastructure planning, operation and deferral, and other issues.

DEMAND RESPONSE AUCTION MECHANISM – Aggregated demand response solicited by investor-owned utilities from third-party aggregators and bid directly into the California ISO market by third-party aggregators, typically as Proxy Demand Resources.

EFFECTIVE LOAD CARRYING CAPABILITY – A metric used to assess the capacity value or reliability contribution of electricity resources.

EXPECTED UNSERVED ENERGY – A measure of the amount of customer demand that cannot be supplied due to a shortage of electricity generation.

HOUR(S) ENDING – A term that denotes the preceding hourly period in the California ISO market. For example, 12:01 a.m. to 1:00 a.m. is hour ending 1.

INDEPENDENT SYSTEM OPERATOR – An entity regulated by the Federal Energy Regulatory Authority that operates transmission facilities and dispatches electricity resources, but has no financial interest in these facilities or resources.

INTEGRATED ENERGY POLICY REPORT – A California Energy Commission report that contains an integrated assessment of major energy trends and issues facing California's electricity, natural gas, and transportation fuel sectors. The report provides policy recommendations to conserve resources, protect the environment, ensure reliable, secure, and diverse energy supplies, enhance the state's economy, and protect public health and safety.

INVESTOR-OWNED UTILITY – A private company that provides a utility, such as water, natural gas, or electricity, to a specific service area. The investor-owned utility is regulated by the California Public Utilities Commission (CPUC).

LOAD IMPACT PROTOCOLS – A set of guidelines comprised of 27 protocols that are used to estimate the aggregate load drop impacts of demand response programs. The Load Impact Protocols provide guidance on how to measure the historical (ex-post) performance of demand response programs which informs the future (ex-ante) performance of demand response programs.

LOAD SERVING ENTITY – Any entity that has been granted authority or has an obligation pursuant to state or local law, regulation, or franchise to sell electric energy to end-use consumers of electric power.

LOCAL REGULATORY AUTHORITY – The state or local governmental authority, or the board of an electric cooperative, responsible for the regulation or oversight of a utility.

LOSS OF LOAD EXPECTATION – The expected number of hours per year that available generation capacity will be inadequate to supply customer demand.

LOSS OF LOAD PROBABILITY – The likelihood (probability) that system demand will exceed the generating capacity during a given period.

PROXY DEMAND RESOURCE – Economic demand response comprised of a load or aggregation of loads that bid into the California ISO market under normal operating conditions.

PROPOSED REVISION REQUEST – Policy changes to a California ISO Business Practice Manual (BPM) are submitted as a Proposed Revision Request into the California ISO BPM change management process for consideration.

QUALIFYING CAPACITY – The maximum Resource Adequacy capacity that an electricity resource may be eligible to provide to the California ISO. The criteria and methodology for

calculating the Qualifying Capacity of resources are established by the CPUC or other applicable Local Regulatory Authority.

RELIABILITY DEMAND RESPONSE RESOURCE – Emergency demand response comprised of a load or aggregation of loads that bid into the California ISO market during supply-shortage conditions.

RESOURCE ADEQUACY – The ability of electricity resources (supply) to meet the customers' energy or system loads (demands) at all hours within a study period.

RESOURCE ADEQUACY AVAILABILITY INCENTIVE MECHANISM – A mechanism through which the California ISO assesses nonavailability charges and provides availability incentive payments to Resource Adequacy resources based on whether the performance of these resources falls below or above, respectively, defined performance thresholds.

APPENDIX A: Acronyms and Abbreviations

Acronym	Term
API	Agricultural and Pumping Interruptible Program
BIP	Base Interruptible Program
BPM	Business Practice Manual
CBP	Capacity Bidding Program
CCA	Community Choice Aggregator
CEDMC	California Energy + Demand Management Council
CLECA	California Large Energy Consumers Association
CPM	Capacity Procurement Mechanism
DR	Demand Response
DRAM	Demand Response Auction Mechanism
ELCC	Effective Load Carrying Capability
EUE	Expected Unserved Energy
HE	Hour(s) Ending
IEPR	Integrated Energy Policy Report
IOU	Investor-Owned Utility
ISO	Independent System Operator
LIP	Load Impact Protocols
LOLE	Loss of Load Expectation
LOLP	Loss of Load Probability
LRA	Local Regulatory Authority
LSE	Load Serving Entity
PDR	Proxy Demand Resource
PRR	Proposed Revision Request
QC	Qualifying Capacity
RA	Resource Adequacy
RAAIM	Resource Adequacy Availability Incentive Mechanism

RDRR	Reliability Demand Response Resource

ATTACHMENTS

Attachment I: Updated - DR ELCC Guide Using LIP-Informed Profiles to Calculate DR ELCC in SERVM,
https://efiling.energy.ca.gov/GetDocument.aspx?tn=241246&DocumentContentId=75092

Attachment II: CEDMC Interim DR Qualifying Capacity Methodology Proposal,
https://efiling.energy.ca.gov/GetDocument.aspx?tn=241266&DocumentContentId=75112

Attachment III: CLECA Alternative LIP + LOLE Approach Proposal,
https://efiling.energy.ca.gov/GetDocument.aspx?tn=241485&DocumentContentId=75442