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Staff Proposal for Resource Procurement Framework in Integrated Resource Planning

CPUC Energy Division
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Contents

1. Executive Summary

Resource planning is essential, but on its own is not sufficient to achieve state goals. To be effective, planning must lead to procurement. This Staff Proposal provides stakeholders and the California Public Utilities Commission (CPUC) with options and recommendations for the design of a framework for a procurement process, in the context of California's Integrated Resource Planning (IRP) process for the electric sector.

The IRP process can lead to procurement through two routes: through regular load-serving entity (LSE) procurement activities in response to the guidance of Reference System Plans (RSP) and Preferred System Plans (PSP), or through procurement orders. This Staff Proposal addresses both, by describing how the CPUC may order procurement to complement the procurement by LSEs that already occurs in response to the planning track activities of IRP and various CPUC procurement programs.

Staff puts forward this "straw" framework proposal for a procurement process with the aim to receive stakeholder input in due course, revise accordingly, and have it be formally adopted by the CPUC. Staff outlines a generic procurement process and recommends how the main steps be undertaken. This collection of recommendations together comprise the proposed IRP Procurement Framework. Staff proposes that the Framework be implemented in phases, ultimately resulting in an ongoing procurement process.

Staff has categorized recommendations into "Phase 1," intended to be applied during the current IRP cycle through 2021, and "Phase 2," to be applied starting with the next IRP cycle.

This proposed framework is intended to provide a conceptual foundation for all future procurement informed by the IRP process. Staff expects the next instance of potential procurement in IRP will be associated with mid-decade reliability needs, including to address the retirement of Diablo Canyon Power Plant (DCPP). Staff expects the analysis of that procurement need and potential order to be addressed in a January 2021 ruling in the IRP proceeding. This document is organized as follows:

Section 2 provides background on IRP, the approach to procurement to date, and the preparations so far to establish the "procurement track" of IRP. Staff also puts forward principles which are used to guide its recommendations.

Section 3 describes the main problems that the Framework should address.

The current guidance from the IRP planning track and existing procurement programs is expected to be insufficient to inform procurement actions and ensure optimal procurement outcomes.

The heat storm of August 2020, and the resulting rotating outages, demonstrate in a very concrete manner, the importance of resource planning as well as timely resource procurement. Following these reliability events the California Independent System Operator (CAISO), CPUC, and California Energy Commission (CEC) conducted a preliminary root cause analysis and determined, amongst other things, that "in transitioning to a reliable, clean and affordable resource mix, resource planning

targets have not kept pace to lead to sufficient resources that can be relied upon to meet demand in the early evening hours."[1]

Although the IRP process is designed for potential procurement authorization to be considered during both RSP and PSP adoption, currently the mechanism for the procurement is undeveloped. There is no formal standard for how procurement need may be identified, how procurement may be ordered or authorized by the CPUC as part of adopting IRP plans, or how the adopted system level IRP plan relates to the CPUC approving or certifying LSEs' plans. Further, there is a lack of understanding regarding which LSEs will be responsible for future procurement and how this responsibility will be enforced. This ambiguity can result in uncertainty for LSEs and the broader market, ultimately posing a barrier to efficient procurement.

The specific problems that are considered in this proposed Procurement Framework include:

- Lack of clarity regarding CPUC's procurement process within IRP
- Definition of "renewables integration"
- Risk of over-relying on Renewables Portfolio Standard (RPS) as a greenhouse gas (GHG)-based procurement program
- Weak alignment between Integrated Resource Planning and Resource Adequacy
- Difficulty in defining and measuring system reliability under increasing penetration of variable renewables
- Challenges to ensuring system reliability in a fragmented LSE market combined with development risk associated with new resource types
- Challenges LSEs face in procuring some resource types

Section 4 describes the two primary evaluation criteria staff used to compare options and evaluate the framework as a whole:

1. **Effectiveness**: The likelihood of achieving the overarching purpose of the Procurement Framework by implementing the option.

2. **Technical and Administrative Feasibility:** The likelihood that an agency/entity can implement the option well given the availability of resources, tools, and data required.

Section 5 outlines the generic steps of a procurement process from the perspective of the CPUC.

[1] *Preliminary Root Cause Analysis: Mid-August 2020 Heat Storm* available at: http://www.caiso.com/Documents/Preliminary-Root-Cause-Analysis-Rotating-Outages-August-2020.pdf

Figure 1. Relationship between planning and procurement processes in IRP

The procurement process steps are used to organize the options and recommendations in this document. The recommended approaches for each step together comprise the "framework" that staff proposes. The procurement steps should answer the following questions:

1. Procurement Need Determination (section 6)
    a. How should the need for procurement, in terms of the quantity and timing of resource attributes, or specific resource types (if appropriate), be determined?
    b. Should the need for procurement only be assessed in aggregate, or also at individual LSE level?
    c. What analytical steps would be performed?
    d. What information is required? What models would be used?
2. Procurement Need Allocation (section 7.1)
    a. Which LSEs are responsible for the procurement that is needed?
    b. On what basis are they responsible?
    c. How is need and responsibility reallocated if load migrates between LSEs or an LSE financially fails?
3. Procurement and Operating Entity Direction (section 7.2)
    a. Who conducts solicitation(s), evaluates bids, selects resources, and recovers the costs?
    b. Should LSEs self-provide in all instances of procurement need being determined? If not, what are the unique conditions under which some form of centralized procurement is appropriate?

   c. Should LSEs be given the option to opt-out of self-provision even when centralized procurement is not necessary?
   d. Who should own and operate the resources? If a resource is serving the needs of multiple LSEs, how should their interests be represented?
   e. What are the criteria for resolving these issues e.g., credit risk and potential impact on ability for financing to be raised?

4. Set Cost Allocation Mechanism (section 7.3)
   a. For LSEs that do not procure, due to opting-out or failing to meet their allocated need, how should the costs incurred to procure the resulting shortfall be allocated?

5. Procurement Approval Process (section 8)
   a. What steps in the procurement process require CPUC approval?
   b. Is CPUC approval required equally for all LSEs and resource types?
   c. What procurement oversight should the CPUC have? What bid evaluation criteria should procurement entities use to evaluate resources, in order to best meet the need? How does the CPUC guide this?
   d. What information will be required by the CPUC to consider requests for approval and how and when will it be provided?
   e. What criteria will the CPUC use to approve or disapprove?

6. Compliance Monitoring & Enforcement (section 9)
   a. What does the CPUC need to monitor compliance with procurement requirements, what information will it require to monitor compliance and how will it receive this information?
   b. What are the consequences of procurement failure, who bears these consequences and how does the CPUC enforce the identified consequences?

7. Incorporation of Procurement Outcomes into Planning Process (section 10)
   a. Following a procurement order, how certain should it be assumed that the resource needs will be met?
   b. Should procurement orders be incorporated into future IRP modeling baselines?

Staff puts forward a range of options in section 6 through section 10; these options would establish a set of regulatory structures that over time would enable a range of challenges to be more fully addressed. In many instances, options are complementary to one another rather than mutually exclusive. Staff concludes each section by recommending a combination of options it believes to be optimal. Staff has categorized recommendations into Phase 1, intended to be applied during the current IRP cycle through 2021, and Phase 2, to be applied starting with the next IRP cycle.

Section 6 focuses on the fundamental step to procurement: determining its need. Staff distinguishes between procurement need and resource need found as part of the planning process. Staff explores a range of alternative analytical approaches, and recommends how procurement need should be determined based on reliability, GHG reduction, or other drivers of procurement. Particularly given the rotating outages of August 2020, staff recommends that the CPUC considers increasing the load forecast and/or planning reserve margin used to determine the need for reliability procurement.

Section 7 addresses the steps involved in the CPUC ordering procurement: allocating the responsibility for the need to LSEs; identifying the appropriate entity/ies to conduct the procurement, if not the responsible LSEs themselves; and determining how the procurement entity/ies will allocate the costs incurred to those that they procure on behalf of.

Section 8 focuses on the process of gaining CPUC approval to recover the costs of procurement. Staff recommends the use of existing CPUC requirements including applications, though allowing approval via Tier 3 Advice Letters for urgent procurement, and under Phase 2, the development of a common resource valuation methodology.

Section 9 focuses on the compliance processes associated with procurement. Staff recommends annual monitoring of compliance and continued use of the threat of "just in time" backstop procurement as an enforcement mechanism. Additionally, for Phase 2 staff recommends the development of a standard method for establishing monitoring milestones and triggers for corrective action.

Section 10 addresses the ways in which procurement in IRP should relate back to the planning process. Under Phase 1 staff recommends incorporating resources into the baseline used in the planning track only once the procurement is contracted and approved by the CPUC or the LSEs' highest decision-making authorities, as applicable. Whereas under Phase 2, staff recommends the CPUC takes the time to develop an "In Procurement" resource category within the planning track of IRP.

Section 11 concludes the Staff Proposal by assessing the recommendations under each of Phase 1 and under Phase 2 against the established criteria. Overall, staff finds that Phase 1 recommendations should be moderately effective, with a high likelihood of implementation for urgently considering the potential need for procurement of resources by mid-decade. Phase 2 recommendations improve on Phase 1, to increase the likelihood of the Framework being effective in the long-term. The technical and administrative feasibility of Phase 2 is less certain due to the nascent stage of some of the recommended options. For this reason, staff seeks to collaborate with stakeholders to refine the recommended options so that they are highly effective but also feasible to implement. The conclusion also includes potential next steps.

The set of options that staff recommends, discussed in sections 6 to 10, are summarized in the following flowcharts:

Figure 2. Proposed Phase 1 IRP procurement process

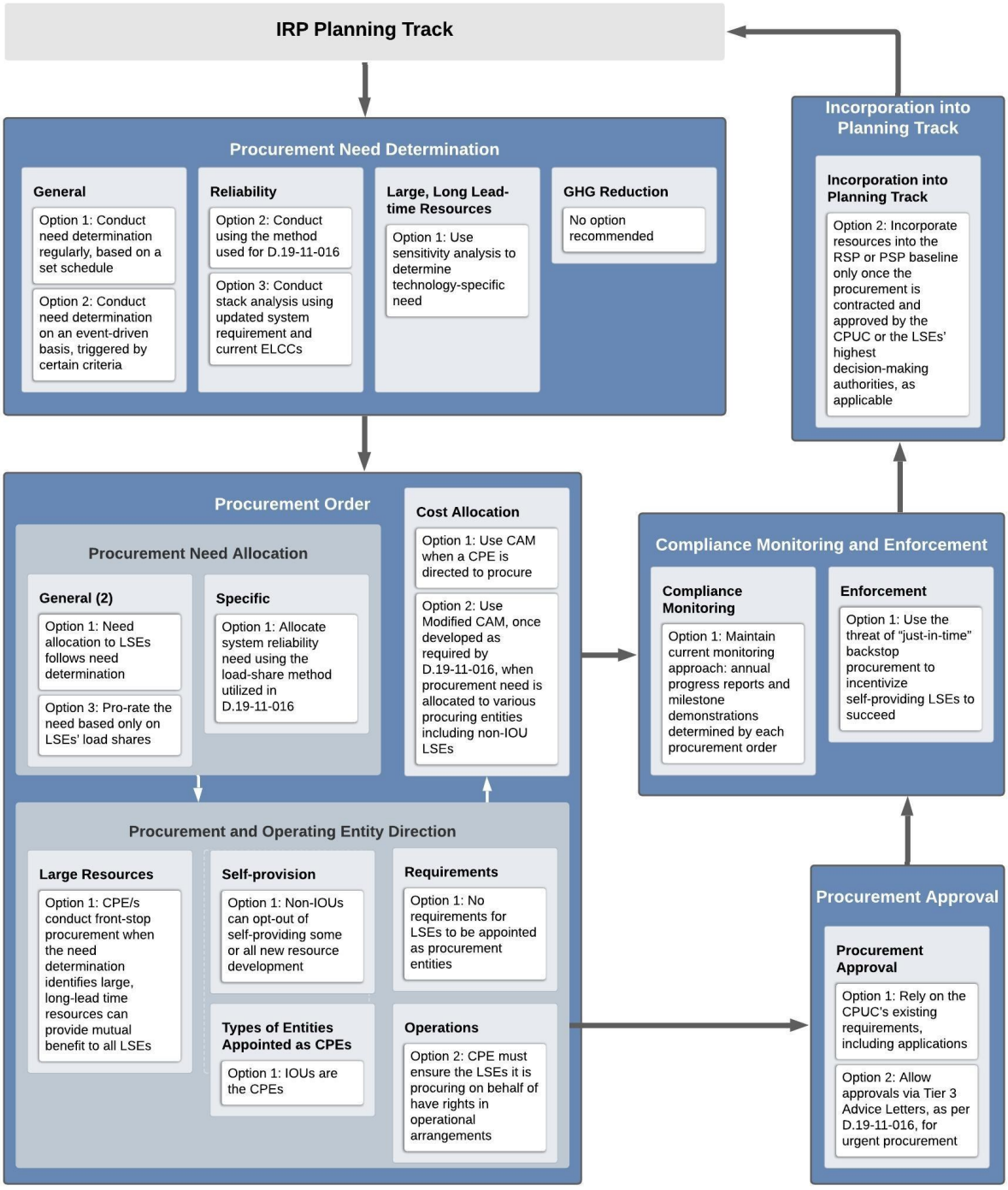
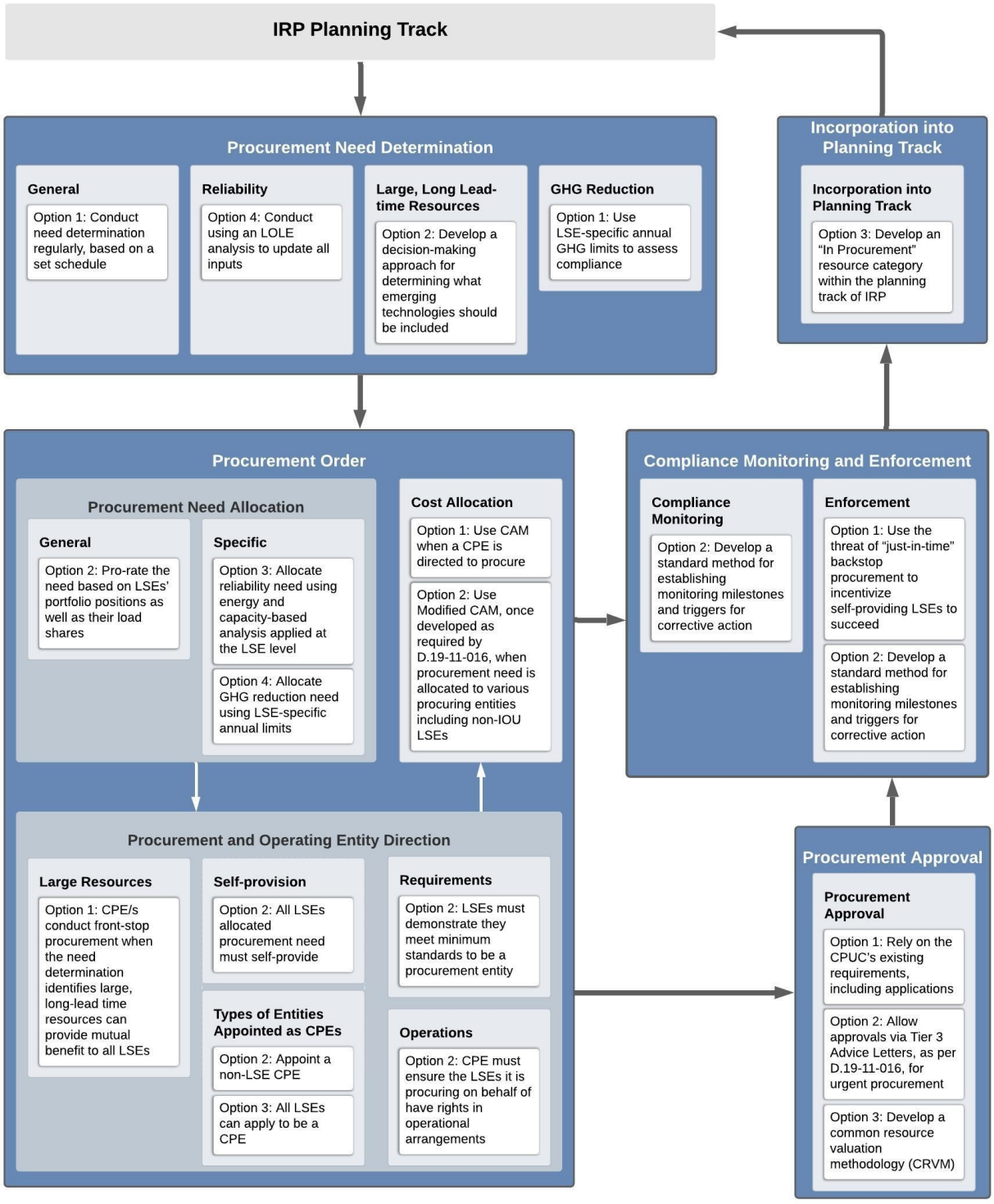


Figure 3. Proposed Phase 2 IRP procurement process



2. Introduction

2.1. Integrated Resource Planning Background

In 2017, the *Proposal for Implementing Integrated Resource Planning at the CPUC*[2] defined "procurement" for the purposes of the IRP process as any formal or informal activity by the CPUC or CPUC staff that is intended to directly or indirectly affect the development and acquisition of new supply- or demand-side energy resources by LSEs or LSE customers. The 2017 IRP Staff Proposal distinguished the importance of procurement, as compared to planning, as the means through which the electric sector can actually achieve measurable state goals, including greenhouse gas reduction and reliable electric service at just and reasonable rates. It highlighted that for this reason, procurement must be monitored and evaluated by the CPUC.

The CPUC is currently in its second cycle of the IRP process. Since 2017, the CPUC's IRP efforts have primarily focused on improving resource planning, with the exception of one procurement order in November 2019 under Decision (D.)19-11-016.[3] However, with the passing of Senate Bill (SB) 100,[4] which established more ambitious GHG reduction goals, and a continuously evolving market, which tests investment and operational certainty, the need for a procurement framework has moved to the forefront.

The first IRP cycle resulted in the adoption of a PSP[5] that approved, certified, or did not certify, as applicable, the individual integrated resource plans filed by each LSE. The CPUC's order adopting the PSP did not order any LSEs to undertake any specific resource procurement, but it did certify individual LSE plans. LSEs must report annually what resources they have contracted for, to allow for the monitoring of progress towards the most recently adopted RSP or PSP. However, the CPUC does not have a formal mechanism for ensuring that the procurement occurs in a timely manner.

The Decision adopting the 2018 PSP (D.19-04-040) determined that "the realization of the PSP by 2030 will require concrete procurement of specific resources by many LSEs, with a heavy focus on procurement by community choice aggregators (CCA) to serve their expanding load." In addition, the Decision found that additional attention is warranted for the near- and medium-term reliability planning aspects of the IRP process. For these two reasons, the Decision initiated a "procurement track" within the IRP proceeding "to explore options for facilitating procurement, beyond that already planned or being undertaken by LSEs individually, of some existing and some new types of resources that are determined to be necessary for maintaining system reliability and/or to facilitate renewable integration."[6]

In parallel with the development and adoption of the PSP in 2018, multiple LSEs were unable to meet their year-ahead local resource adequacy requirements, which resulted in

[2] https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442453456
[3] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M319/K825/319825388.PDF
[4] https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100
[5] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M287/K437/287437887.PDF
[6] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M287/K437/287437887.PDF

growth in backstop procurement by the CAISO.[7] Meanwhile at the system level, the CPUC found the following factors combining to lead to near-term capacity need: the retirement of once-through-cooling (OTC) generators, system peak shifting to later in the day, uncertainty in the amount of imports available to meet resource adequacy (RA) needs in future, and increasing variability in hydroelectric resource available each year. This resulted in an accelerated need determination for additional resources and in November 2019 the CPUC adopted D.19-11-016, which is discussed further in section 2.2 below and throughout this document. While the IRP procurement track has resulted in significant quantities of contracts for new resources, there are few new resources that have come online yet as a direct result of the November 2019 order.

D.20-03-028 adopting the second IRP RSP anticipates an unprecedented amount of new build clean energy resources by 2030. The optimal portfolio of energy resources is expected to consist of approximately 14,500 megawatts (MW) of new supply-side renewables, 8,900 MW of new battery storage and 1,000 MW of new long-duration storage resources by 2030, in addition to existing resources. In the 2021-23 timeframe the CPUC's RSP identifies a need for new resources consistent with the procurement order in D.19-11-016. It also identifies the need for long lead-time resources such as long-duration storage and out-of-state wind in the 2026 and 2030 timeframes, respectively. This Decision also signals the CPUC's intent to examine the steps needed to support the development of these resources, and potentially others, such as geothermal and offshore wind.[8]

D.20-03-028, highlights the following issues:

- High levels of new renewable and GHG-free resource procurement will be required by 2030.
- Procurement of long lead-time resources may face a unique set of challenges.
- Improved and deliberate alignment between the planning process and the procurement process is necessary.

This Staff Proposal explores how the provision of clear guidance from a planning process to inform procurement actions may not be sufficient on its own to ensure optimal procurement outcomes. It lays out a procurement framework for addressing the issues outlined above.

Staff uses various terms throughout this document with definitions outlined in Table 1 below, and illustrates the relationship between planning and procurement processes in IRP in Figure 4.

[7] See CPUC's Web site on Waivers and Penalties for a list of the 85+ Resource Adequacy Citations Issued 2009-2020, and Local Waivers Issued 2018-2020, https://www.cpuc.ca.gov/General.aspx?id=6442460914

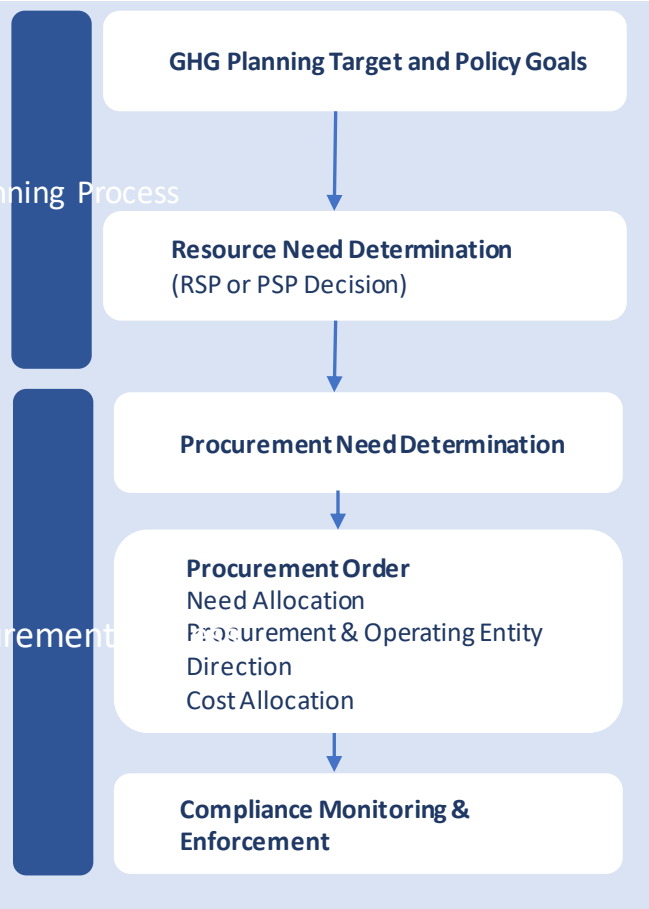
[8] See CPUC Fact Sheet on CPUC's IRP decision in March 2020, D.20-03-028, https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442464699

Table 1. Definition of terms used in this Staff Proposal

Term	Definition	References
Planning track	Planning-related activities in the IRP proceeding	R.20-05-003 Assigned Commissioner's Scoping Memo and Ruling, 24 September 2020[9]
Procurement track	Procurement-related activities in the IRP proceeding, including addressing the broad framework for requiring and conducting procurement, as well as procurement orders or other CPUC actions	R.20-05-003 Assigned Commissioner's Scoping Memo and Ruling, 24 September 2020
IRP Procurement Framework	Collection of guiding principles, problem statement, criteria for success, and descriptions of steps to achieve the objectives of procurement in the IRP proceeding	This Staff Proposal: sections 2 through 11, which should be superseded by a CPUC-adopted procurement framework in due course, and updated from time to time
IRP procurement process	Series of steps to achieve procurement within the IRP proceeding	Illustrated in Figure 5 in section 5
Step	A particular part of the procurement process, undertaken by the CPUC	Steps 1-7 as outlined in section 5, and explored in sections 6 through 10

[9] Available here: https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M347/K608/347608446.PDF

Figure 4. Relationship between planning and procurement processes in IRP



2.2. Procedural Background

To develop a range of options and recommendations related to procurement, staff starts by describing the CPUC's jurisdictional authority staff assumes is relevant to procurement. Staff believes this includes, but is not limited to, actions related to ordering procurement, monitoring of procurement, enforcement of procurement, as well as cost allocation. The following Public Utilities (PU) Code sections are particularly significant to this:

- PU Code Section 454.51 requires that the CPUC *identify a diverse and balanced portfolio of resources… that provides optimal integration of renewable energy in a cost-effective manner.*
- PU Code Section 454.51 also requires the CPUC to *...adopt a process for each load-serving entity…to file an integrated resource plan…to ensure that load-serving entities do the following…*
    - *Meet statewide GHG emission reduction targets*
    - *Comply with state RPS target*

- *Ensure just and reasonable rates for customers of electrical corporations*
- *Minimize impacts on ratepayer bills*
- *Ensure system and local reliability*
- *Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities*
- *Enhance distribution system and demand-side energy management*
- *Minimize air pollutants with early priority on disadvantaged communities*

- PU Code Section 454.51(d) gives the CPUC authority to require CCAs to enter long-term contracts with renewable integration resources.

- PU Code Section 454.52 provides the CPUC with procurement authority related to investor owned utilities (IOU):

> *(2)(A) The commission may authorize all source procurement for electrical corporations that includes various resource types including demand-side resources, supply side resources, and resources that may be either demand-side resources or supply side resources, taking into account the differing electrical corporations' geographic service areas, to ensure that each load-serving entity meets the goals set forth in paragraph (1).*
>
> *(B) The commission may approve procurement of resource types that will reduce overall greenhouse gas emissions from the electricity sector and meet the other goals specified in paragraph (1), but due to the nature of the technology or fuel source may not compete favorably in price against other resources over the time period of the integrated resource plan.*

- PU Code Section 380 provides the CPUC with the authority to enforce procurement across all LSEs to ensure reliability while advancing other state goals.

> *380 (b) In establishing resource adequacy requirements, the commission shall ensure the reliability of electrical service in California while advancing, to the extent possible, the state's goals for clean energy, reducing air pollution, and reducing emissions of greenhouse gases. The resource adequacy program shall achieve all of the following objectives…*
>
> *(1) Facilitate development of new generating, nongenerating, and hybrid capacity and retention of existing generating, nongenerating, and hybrid capacity that is economic and needed.*
>
> *(2) Establish new or maintain existing demand response products and tariffs…to meet or reduce… resource adequacy requirements.*
>
> *(3) Equitably allocate the cost of generating capacity and demand response in a manner that prevents the shifting of costs between customer classes.*
>
> *(4) Minimize enforcement requirements and costs.*
>
> *(5) Maximize the ability of community choice aggregators to determine the generation resources used to serve their customers.*

The RA program is a compliance program and, as currently implemented, does not directly order the development of new capacity. The RA program, by itself, cannot ensure the needed resources are under contract if resources are not developed in time to be available to be contracted to meet the system, local, and flexible resource adequacy requirements. Prior to the onset of the IRP process in 2017, the CPUC's Long-Term Procurement Plan (LTPP) process complemented the RA program to ensure sufficiency of resources leading into the RA process. In the current planning paradigm, the IRP process must now perform the crucial role of ensuring development of the resources required to meet the requirement established by PU Code 380.

In recognition of the importance of the IRP process, the CPUC recently approved an IRP Citation Program via Resolution E-5080. In the Resolution, the CPUC pointed to a wide range of relevant PU Code sections related to authority on monitoring and enforcement.[10] The authority of the IRP Citation Program and the above-mentioned PU Code Sections are not an exhaustive list of statutory authority.

The following CPUC decisions provide further important context to the IRP procurement framework:

- The IRP "procurement track" emanates from D. 19-04-040, and was initially scoped out in the June 21, 2019 Ruling Initiating Procurement Track and Seeking Comment on Potential Reliability Issues.

- The CPUC's first major decision in the IRP procurement track occurred in November 2019: D.19-11-016. It was the first decision ordering procurement in the IRP proceeding, and the decision requires LSEs to procure 3,300 MW of system resource adequacy capacity by 2023 and recommended the extension of operations of several OTC thermal generators for system reliability.[11]

- After the initial IRP procurement track decision, the March 2020 RSP decision reiterated the CPUC's intention of further developing the IRP procurement track:

    - D.20-03-028, adopting the 2019-2020 RSP, states "Commission will explore further in the procurement track … how to go about ensuring that [out-of-state wind, pumped storage hydro, or other long-duration resources] are planned for and procured for"; "take up question of the concrete steps the Commission can take to support the development of the resources"; "we remain interested in exploring the development of geothermal and offshore wind resources."[12]

    - D.20-03-028 Conclusion of Law 15 states: "The Commission should, in the procurement track of this proceeding, continue to consider steps required to develop and procure not only the resources identified in the 2019-2020 RSP, but also

[10] CPUC IRP Citation Program, E-5080, Adopted August 7, 2020, https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M344/K806/344806352.PDF
[11] CPUC Website on IRP Procurement Track 2019, https://www.cpuc.ca.gov/General.aspx?id=6442463413
[12] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M331/K772/331772681.PDF

potentially additional geothermal and offshore wind resources, or other resources designed to bring diversity to the portfolio."

The legacy of the CPUC's LTPP process, and the comparatively short experience of the IRP process, is that long-term resource planning in California is currently fragmented. The advent of the IRP process in 2017, coincident with other factors including the expansion of CCA and electric service provider (ESP) market share and the rise in RA program citations, has resulted in a disjointed, and consequently fraught, approach to ensuring reliability and reducing GHG emissions. The CPUC has ensured reliability on a "proceeding by proceeding" basis; however, the statutory intent of the IRP process was to optimize across resource types, proceedings, and LSEs. While the planning elements of IRP have been established and implemented in the first and second cycles of IRP, this Staff Proposal advances key components of an IRP procurement framework that have not yet been formally established.

2.3. Purpose of this Staff Proposal

Staff intends for this document to provide decision-makers, parties, and procurement entities with credible options and recommendations on the design of an IRP procurement framework. In summary, staff expects that this means initiating dialogue between decision-makers and stakeholders about the specific purpose, timing, and features of potential IRP procurement orders, in the context of the broader IRP process and LSEs planning to procure.

Staff's background reasoning for focusing the Staff Proposal on this purpose is:

- The procurement track of IRP should complement the planning track, so that LSEs procure resources that are, in aggregate, broadly consistent with the optimal portfolio adopted by the CPUC, i.e., the RSP or PSP, as applicable.

- The primary acceptable reasons for LSEs to procure a resource mix that departs from the optimal portfolio found in the planning track are:

    - LSEs' specific resource preferences, given their individual objectives, within bounds;

    - Each LSE makes their own procurement decisions and it is not practical that each LSE will provide exactly their proportional share of the optimal portfolio; the nature of multiple LSEs conducting procurement means that each LSE's portfolio may vary but that collectively they should approach the optimal portfolio; and/or

    - LSEs find actual costs and other key factors in procurement differ from the key assumptions made in forming the optimal portfolio, due to the passing of time and/or planning processes necessarily simplifying the "on-the-ground" realities of procurement.

- LSEs should be able to proactively procure a significant portion of future needs without being ordered to do so within the IRP process, given the combination of:
    - Guidance provided by the planning track of IRP (most notably the CPUC's adoption of RSPs and PSPs over time); and
    - Existing compliance programs, most notably RA and RPS, with existing penalty structures designed to strongly discourage insufficient procurement on the part of LSEs.
- To facilitate such proactive procurement by LSEs, it is crucial that there is a common understanding of the role of IRP procurement orders and the results that the planning process can expect from those orders. Staff suggests that the role of procurement orders is to ensure the procurement of resources that would not otherwise be procured given existing programs (RA, RPS, and others) and wholesale energy markets, in terms of the volume, mix, and timing determined to be optimal from an integrated perspective.

To achieve this purpose, staff aims for this document to answer the following questions:

(1) **Obstacles -** What are the current obstacles to procuring different resource types?

(2) **Appropriate Circumstances -** Under what circumstances is a CPUC-driven approach to procurement necessary?

(3) **Learnings to Date -** What learnings have there been from D.19-11-016 procurement so far, that should be addressed in future IRP procurement?

(4) **Trigger Mechanism -** When is procurement under the framework triggered?

(5) **Large-Scale Resources -** How should large-scale resources that meet the needs of multiple LSEs be procured, given that the RSP in March 2020 anticipates that these may be part of the optimal mix but beyond the procurement appetite of any LSE?

(6) **Centralized Procurement -** When is it optimal for centralized rather than individual procurement to occur, should it be by a CPUC-directed central procurement entity (CPE) or entities, or via LSE-organized collective action?

(7) **Cost Allocation -** How should responsibility and costs be allocated, considering "causer pays" or other appropriate approaches?

(8) **Transmission Considerations -** How should transmission procurement be accounted for when providing direction on generation or storage resource procurement?

(9) **LSE Obligation Failure -** How will procurement needs be fulfilled if LSEs with procurement obligations occasionally or consistently avoid undertaking forward procurement?

Staff acknowledges that the IRP process is not the only driver of resource procurement. Various CPUC procurement programs, including Demand Response, Storage, Energy

Efficiency, may be impacted by the IRP Procurement Framework that is ultimately established. Although this nexus is considered by staff, and staff expect the impacts to complementary, changes to other programs are outside of the scope of the options evaluated in this Staff Proposal.

This proposed framework is intended to provide a conceptual foundation for all future procurement informed by the IRP process. Staff expects that the next instance of potential procurement in IRP to be associated with mid-decade reliability needs, including to address the retirement of DCPP. Staff expects the analysis of that procurement need and potential order to be addressed in a January 2021 ruling in the IRP proceeding.

2.4. Guiding Principles

The following principles are intended to guide the establishment of the IRP Procurement Framework. Criteria with which to assess whether framework options adhere to these principles are described in section 4.

1. **Broad Direction** - CPUC should direct procurement broadly and defer to LSEs for the soliciting, negotiating, and contracting of specific resources.
2. **Specifics May Vary By Technology -** CPUC's IRP procurement need should typically be determined in as general terms as possible and leave competitive market processes to identify the optimal resource types and locations. However, Staff notes there may need to be exceptions to this, as allowed for in Public Utilities Code Section 454.52 (a)(2)(B)[13] to promote resource diversity or pursue large-scale, long lead-time resources with a distinct strategy, and so the CPUC needs to find reasonable ways to have technology-specific processes in the IRP Procurement Framework.

Structure and design of the CPUC's IRP Procurement Framework should:

3. **Allow State to Meet Goals** - Enable California to meet policy goals and be consistent with statutory requirements, including SB100 and SB350.
4. **Be Transparent** - Provide transparent and actionable direction to facilitate sufficient, timely, and cost-effective resource and infrastructure investments.
5. **Be Repeatable -** Be repeatable, adaptable, and predictable for future cycles of IRP.
6. **Align with Needs of Other Planning Agencies and Entities -** Align with related planning and procurement processes of the CPUC and other state and federal agencies and entities, while avoiding redundancy and conflict with other state policies and programs.
7. **Link Planning to Procurement -** Encourage and maintain a strong link between planning and procurement; it should not disincentivize LSEs to plan appropriately in their IRP plans and procure according to their specific IRP plans.

[13] PU Code Section 454.52 (a)(2)(B): "The commission may approve procurement of resource types that will reduce overall greenhouse gas emissions from the electricity sector and meet the other goals specified in paragraph (1), but due to the nature of the technology or fuel source may not compete favorably in price against other resources over the time period of the integrated resource plan."

3. Problem Statement

3.1. Overarching Problem

Staff identify a range of problems that currently pose barriers to optimal procurement and require the implementation of a clear procurement framework. The current guidance from the IRP planning track and existing procurement programs is expected to be insufficient to inform procurement actions and ensure optimal procurement outcomes.

Markets and programs are designed to incentivize optimal investment. The Resource Adequacy program aims to ensure that sufficient capacity is available to serve electric demand. The wholesale electricity market design seeks to commit and dispatch units efficiently to deliver energy and ancillary services, and to signal where, and in what form, new investment is needed.

The electric grid, however, does not have ease of entry and exit. Combined capacity prices and energy prices may not be sufficient to keep generators online or to encourage new entrants.[14] A procurement framework combined with other market solutions may be required to overcome these barriers.

While the challenges associated with the need for forward capacity revenues to support the building of new resources has been with California for most of the past two decades, the increasing dominance of renewable energy is pushing the capacity issues into even starker relief. As California's electric generation mix continues steadily towards decarbonization, there will be an increase in hours per year during which the marginal resource is a zero-cost resource. As energy market revenues decline from the increase in preponderance of zero marginal cost resources, the ability for both existing and new resources to receive capacity payments through forward contracting will continue to be important. If markets do not provide sufficient revenue streams, new resources may not be able to enter the market.

Simultaneously, with an increase in the penetration of variable and use-limited resources, the electric system will have fewer resources that could produce energy exactly when needed, for the duration needed. Historically, the most common solution would be to use flexible, fast-ramping reliable gas generation to provide reliable capacity to cover times of system stress. However, as we move towards the goals established by SB100, the historic solutions are less viable and alternative, potentially more complex solutions need to be considered. The heat storm of August 2020, and the resulting rotating outages, demonstrate in a very concrete manner, the importance of resource planning as well as timely resource procurement. Following these reliability events the CAISO, CPUC, and CEC conducted a preliminary root cause analysis and determined, amongst other things, that "in transitioning to a reliable, clean

[14] *Resource Adequacy and Wholesale Market Structure for a Future Low-Carbon Power System in California,* Tierney, 2018, available at: https://www.analysisgroup.com/globalassets/content/insights/publishing/tierney_california_resource_adequacy_and_wholesale_market_design.pdf

and affordable resource mix, resource planning targets have not kept pace to lead to sufficient resources that can be relied upon to meet demand in the early evening hours."[15]

Preliminary recommendations included the following:
"Increase RA requirements for LSEs to more accurately reflect increasing risk of extreme weather events - The current planning targets were developed in 2004 and have not been updated since. The 1-in-2 load forecast plus a 15% reserve margin should be updated to better account for heat storms like the ones encountered in both August and September. The CPUC already has an open proceeding to consider changes in how the planning targets are set for the purposes of RA rules and this discussion should start before summer 2021. Once these changes are developed, the CPUC, CEC, and CAISO should ensure they are used consistently across all long- and short-term planning programs."

This Procurement Framework aims to provide a structure for ensuring that recommendations such as the above are implemented in CPUC planning and procurement processes in a consistent manner, translating to timely procurement in the future.

This Staff Proposal does not aim to propose detailed new market structures to support the grid integration of a high penetration of renewables. However, the options explored in section 6 through section 10 would produce a set of regulatory structures that, over time, would enable these problems to be more fully addressed. Staff briefly describes the specific problems that are relevant to be considered in this proposed Procurement Framework below. This is not an exhaustive list.

3.2. Specific Problems

Lack of Clarity Regarding CPUC's Procurement Process within IRP

Currently, although the IRP process is designed for potential procurement authorization to be considered during both RSP and PSP adoption, the mechanism for the procurement is undeveloped. There is no standard for how procurement may be ordered or authorized by the CPUC as part of adopting IRP plans, and how the adopted system level IRP plan relates to the CPUC approving or certifying LSEs' plans. Further, there is a lack of understanding regarding which LSEs will be responsible for future procurement and how this responsibility will be enforced. This ambiguity can result in uncertainty for LSEs and the broader market, ultimately posing a barrier to efficient procurement.

Definition of "Renewables Integration"

Public Utilities Code Section 454.51(a) requires that the CPUC "identify a diverse and balanced portfolio of resources needed to ensure a reliable electricity supply that provides optimal integration of renewable energy in a cost-effective manner."[16] However, optimal

[15] *Preliminary Root Cause Analysis: Mid-August 2020 Heat Storm* available at: http://www.caiso.com/Documents/Preliminary-Root-Cause-Analysis-Rotating-Outages-August-2020.pdf
[16] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M319/K825/319825388.PDF

integration of renewable energy has been studied extensively by the CPUC for over a decade; it is a complex problem and the solutions not clearly defined. In recognition of this complexity, both D.19-11-016 and the 2018 PSP Decision (D.19-04-040) determined that all new resources in IRP portfolios are needed for renewables integration.

Risk of Over-relying on RPS as a GHG-based Procurement Program

Not all GHG-free resources, for example large-scale hydro, comply with the RPS program and therefore the RPS program should not be relied on as a proxy for GHG reduction efforts. Meeting the state's GHG goals may require procurement of zero-emitting resources beyond that which would be required if simply complying with RPS goals. The Portfolio Content Categories (PCC) used to account for Renewable Energy Credits (REC) under RPS will not align one-for-one as compared to GHG emission accounting under IRP.

Weak Alignment between Integrated Resource Planning and Resource Adequacy

A reliable system is a key objective of IRP, which requires adequate procurement of both existing and new resources to be achieved. Gaps between existing planning and compliance programs, including IRP and RA, could lead to existing resources not being retained when necessary, and/or new resources not being developed in time for when the capacity is required to maintain reliability in compliance with the Resource Adequacy program.

It is important to understand the roles of the RA program and the IRP process in order to more fully understand the question of what planning is likely to materialize into procurement without additional CPUC process and when the CPUC may need to order LSEs to procure resources to maintain reliability and meet other state goals.

The Resource Adequacy program has two stated goals:[17]

- To ensure the safe and reliable operation of the grid in real-time, providing sufficient resources to the CAISO when and where needed.

- To incentivize the siting and construction of new resources needed for future grid reliability.

However, to date, the RA program has functioned as a compliance program with a 1-3 year time horizon, and has primarily involved securing contracts with existing resources. While significant revisions to the RA program have been undertaken in the past decade, including the creation of the flexible RA program (to ensure sufficient flexible resources) and the extension of the RA requirement to a multi-year forward requirement for local resources, the core of the RA program's compliance regimen – the system resource adequacy requirements – look forward only one year. The RA program is focused on compliance, not long-term planning. It is not intended to identify resource needs early enough to allow for their development. The RA program has been intended to serve in the compliance role, and it was initially paired with the LTPP proceeding to ensure the development of resources occurred such that they were available once the near-term planning horizon occurred.

[17] https://www.cpuc.ca.gov/ra/

IRP is the successor to the LTPP, and it is a long-term resource planning process with a minimum 10-year horizon. IRP assumes existing resources as part of the baseline and aims to identify what new resources and transmission need to be developed. However, without a formal framework to ensure the procurement of the resource attributes identified in the IRP process, there is an increased risk that the reliability resources needed will not materialize in a timely and cost-effective manner.

Furthermore, uncertainty about future revenue streams can pose an additional challenge to long-term resource planning and procurement conducted by LSEs. This can be a barrier for procurement of new resources to meet reliability needs in particular.

The following gaps and inconsistencies in the CPUC's reliability assessments in IRP and RA pose a challenge to bridging planning and procurement:

- While the Local RA program recently instituted a 3-year forward procurement requirement, there exists no monitoring of the sufficiency of contracting with existing system resources to inform long-term planning beyond the one-year-ahead system RA requirement.
- Local reliability is not sufficiently incorporated into long-term planning.
    - RESOLVE does not optimize resource selection at a local level.
    - Local RA needs are currently not considered when aggregating LSEs' individual IRPs.
- California's RA program currently treats import capacity as a committed resource, however aside from D.19-11-016 there is no requirement that LSEs sign contracts with resources in other states to ensure that import capacity is backed up with a committed resource.

These gaps can result in reliability shortfalls that require rushed procurement at higher costs for ratepayers than if resources with a longer lead time were able to be considered. The reliance on backstop procurement mechanisms such as the Capacity Procurement Mechanism (CPM) similarly can be costly. Furthermore, there is currently no mechanism to protect the LSEs that have proactively conducted procurement from the additional costs of the rushed procurement. This may disincentivize proactive procurement in the future. Finally, when even rushed procurement is not an option, existing resources may need to be retained through the use of Reliability Must-Run (RMR) contracts. RMR contracts between the CAISO and a resource owner (and filed under Section 41 of the CAISO tariff at the Federal Energy Regulatory Commission) can be an effective short-term tool to address a specific reliability situation, but these agreements do not provide an effective signal for resource development or retention

Difficulty in Defining and Measuring System Reliability under Increasing Penetration of Variable Renewables

The availability of resources to meet system peak is becoming an inadequate measure of reliability. Unlike the issue described above which identifies the gap between the RA and IRP frameworks, this is a technical problem caused by the realities of evolving technologies and markets. For one, with increasing penetration of renewables, the peak has shifted. Furthermore, as battery storage procurement increases it is expected that the peak will flatten out, reducing the effective load carrying capability (ELCC) of batteries. Yet with increased procurement of renewables, power plants may be dispatched less frequently and this may call into question whether thermal generation has adequate revenue streams to remain competitive and stay online in order to meet peak load that may not adequately be met by renewables and battery storage for years to come. The reliability risk may be compounded by the fact that various policies across the western electric grid encourage retirement of thermal plants. Currently California relies on imports to meet system peak. If availability of imports is limited due to policy and market forces outside California, the CAISO electric system is exposed to further reliability risk.

Challenges to Ensuring System Reliability in a Fragmented LSE Market combined with Development Risk associated with New Resource Types

Up until a few years ago, the responsibility for procuring resources rested largely on three IOUs on behalf of a relatively fixed amount of bundled load. Direct access load was capped at a steady level of energy served and there were no CCAs serving load. Since then, the electricity market has become more fragmented in response to the rapid development of community choice aggregation; there are nearly 60 LSEs serving load throughout California. Each LSE is responsible for procuring its own resource adequacy; however, LSEs that fail to meet their obligations are able to pay a fine, and then "lean on" the over-supply of resources by other LSEs (especially in the case of smaller LSEs). However, the over-supply by other LSEs is not guaranteed to continue and so reliability issues may arise.

In conjunction with market fragmentation, there is resource development risk with any new resource required for system reliability. The first decade of the RPS program showed that contract failure is a common attribute of new energy resource development. The CPUC is overseeing a swift transition to a fragmented market where new LSEs are both procuring large quantities of new resources for the first time and also doing so without the benefit of large portfolios that can help hedge against the risk of project failure. Compounding this already challenging situation is the fact that the new LSEs are largely procuring a new resource type – battery storage – without any clear track record of project completion rates. Staff estimates that battery energy storage serving the CAISO market could increase as much as eight-fold in the next 12 months – depending on the project success rate of LSE-contracted capacity.

Challenges LSEs face in Procuring some Resource Types

As depicted in Table 2 below, resource characteristics such as typical size and timeline from solicitation to delivery can vary widely across resources.[18] Furthermore, the extent to which the resource types may be supported by existing programs and markets can also differ. Per

[18] Refer to the Appendices for staff's more detailed comparison of resource types

section 2.3 above, this Staff Proposal aims to clarify the purpose, timing, and other features of IRP procurement orders.

Recognizing that LSEs participating in the IRP process have procured, and should continue to procure, resources without being expressly directed to do so by the CPUC, staff describes two broad categories of resources in order to develop the Procurement Framework:

Routine Resources: Resources that are typically expected to be procured by LSEs without additional CPUC action due to a combination of:

- Existing programs or markets e.g., distributed energy resources, and
- Proven procurement track record by LSEs, given their size, technology, cost relative to compliance obligation, and other features, e.g., solar PV and wind.

Non-Routine Resources: Resources that may require IRP procurement orders due to reasons including:

- The long lead-time to develop certain types of resources, especially those with a slightly higher cost that the least-cost resources,
- The barriers to procuring large-scale resources, including the challenges of accurately predicting or capturing the value the specific resource brings due to its unique operating conditions,
- Lack of procurement of routine resources in a timely manner, leading to an urgent need, and
- Identification of an unexpected resource need.

Table 2. Continuum of procurement characteristics by resource type

Timeline & Ease of Procurement	Example Resource Types	Potential IRP Procurement Framework Implications
Short; straightforward	Batteries, demand response, import contracts	• Need determination could inform existing programs' goals or other key features • May require a procurement order
Medium to long; moderate	Solar, wind, geothermal	• Continued monitoring of existing procurement program (RPS and RA), to determine whether changes are needed to meet requirements found in IRP • May require a procurement order
Long; complex	Pumped storage, out-of-state wind on new transmission, offshore wind	• Likely to require a procurement order and considerable regulatory involvement

4. Criteria for Evaluating Individual Options and Overall Framework

The two primary evaluation criteria for this Staff Proposal are whether the proposed IRP Procurement Framework is effective and feasible. These criteria are offered to evaluate the options considered for each process step, as well as the framework as a whole; these criteria align with the guiding principles in section 2.4 above:

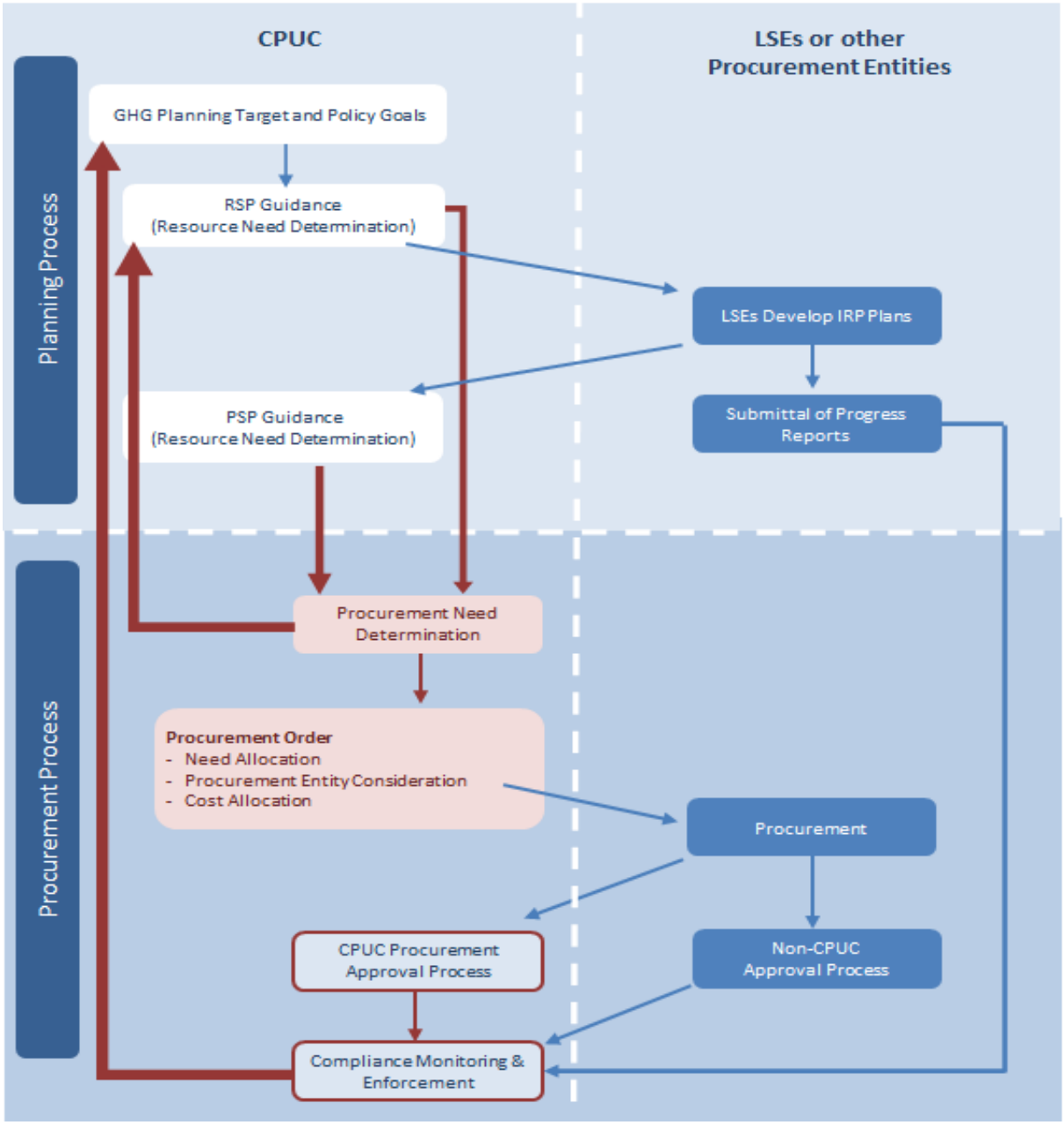
1. **Effectiveness**: The likelihood of achieving the overarching purpose of the Procurement Framework by implementing the option.
    - The framework facilitates sufficient, timely, and cost-effective procurement.
    - The framework incentivizes procurement that is broadly consistent with the optimal portfolio identified by planning.
    - The framework enables California to meet policy goals.
2. **Technical and Administrative Feasibility:** The likelihood that an agency/entity can implement the option well given the availability of resources, tools, and data.
    - The framework aligns with other processes of the CPUC to eliminate redundancy and increase efficiency.[19]
    - The framework is repeatable and long-lasting while being flexible enough to adapt to new challenges as they arise.
    - The framework is feasible (timeline, cost, and other considerations) and implementable.

[19] PU Code 454.52 reads "To eliminate redundancy and increase efficiency, the process adopted pursuant to subdivision (a) shall incorporate, and not duplicate, any other planning processes of the commission."

5. Procurement Framework, Process, and Steps

As depicted in Figure 5 below, the IRP process comprises a planning track and a procurement track. The purpose of this Staff Proposal is to expand on the new steps (shown in red) and help the reader understand how those new steps will overlay onto existing arrangements. In this section staff sets out the following generic procurement steps in order to structure discussion with stakeholders and decision-makers about options. The recommended approaches for each step, together with the guiding principles, problem statement, and criteria for success, comprise the framework that staff proposes.

Figure 5. Schematic of proposed end-state for IRP procurement process



Staff has categorized recommendations into "Phase 1," intended to be applied during the current IRP cycle through 2021, including any upcoming procurement orders to address mid-decade reliability needs that may be associated with DCPP retirement, and "Phase 2," to be applied starting with the next IRP cycle.

Staff describes the following IRP procurement steps from the perspective of the CPUC and defines them by stating questions the steps should answer. The options presented in sections 6 through 10 address some or all of these steps.

1. Procurement Need Determination (section 6)
    a. How should the need for procurement, in terms of the quantity and timing of resource attributes, or specific resource types if appropriate, be determined?
    b. Should the need for procurement only be assessed in aggregate, or also at the LSE-by-LSE level?
    c. What analytical steps would be performed?
    d. What information is required? What models would be used?
2. Procurement Need Allocation (section 7.1)
    a. Which LSEs are responsible for the procurement that is needed?
    b. On what basis are they responsible?
    c. How is need and responsibility reallocated if load migrates between LSEs or an LSE financially fails?
3. Procurement and Operating Entity Direction (section 7.2)
    a. Who conducts solicitation/s, evaluates bids, selects resources, and recovers the costs?
    b. Should LSEs self-provide in all instances of procurement need being determined? If not, what are the unique conditions under which some form of centralized procurement is appropriate?
    c. Should LSEs be given the option to opt-out of self-provision even when centralized procurement is not necessary?
    d. Who should own and operate the resources? If a resource is serving the needs of multiple LSEs, how should their interests be represented?
    e. What are the criteria for resolving these issues e.g., credit risk and potential impact on ability for financing to be raised?
4. Set Cost Allocation Mechanism (section 7.3)
    a. For LSEs that do not procure, due to opting-out or failing to meet their allocated need, how should the costs incurred to procure the resulting shortfall be allocated?
5. Procurement Approval Process (section 8)
    a. What steps in the procurement process require CPUC approval?
    b. Is CPUC approval required equally for all LSEs and resource types?
    c. What procurement oversight should the CPUC have? What bid evaluation criteria should procurement entities use to evaluate resources, in order to best meet the need? How does the CPUC guide this?
    d. What information will be required by the CPUC to consider requests for approval and how and when will it be provided?
    e. What criteria will the CPUC use to approve or disapprove?

6. Compliance Monitoring & Enforcement (section 9)
    a. What does the CPUC need to monitor compliance with procurement requirements, what information will it require to monitor compliance and how will it receive this information?
    b. What are the consequences of procurement failure, who bears these consequences and how does the CPUC enforce the identified consequences?
7. Incorporation of Procurement Outcomes into Planning Process (section 10)
    a. Following a procurement order, how certain should it be assumed that the resource needs will be met?
    b. Should procurement orders be incorporated into future IRP modeling baselines?

6. Procurement Need Determination

6.1. Background

Need determination is the step of identifying what should be procured to meet a planning requirement. Key issues explored in this section include:

- Defining "procurement need" as compared to "gross need," which relates to the role of LSEs' plans in determining procurement need
- Different drivers of need
- When to describe procurement need in terms of specific resource types, rather than by resource attribute
- Timing of determining need

This section introduces need determination in a way that may be directly applicable to long-term resource adequacy requirements at the system level,[20] but should carry broader relevance to drivers of electric sector procurement need in general.

"Baseline" and "planned" are key terms used in this section:

- Baseline resources are those that are currently online or are contracted to come online within the planning horizon. Being "contracted" refers to a resource holding signed contract/s with an LSE/s for much of its energy and capacity for a significant portion of its useful life. The contracts refer to those approved by the CPUC and/or the LSE's governing board, as applicable. These criteria indicate the resource is relatively certain to come online. Refer to section 10 for further detail.
- Planned resources, broadly speaking, are all the other resources included in LSE IRPs that may be in various stages of development, from concept to being solicited or negotiated.

Staff summarizes this distinction between baseline and planned resources as follows:

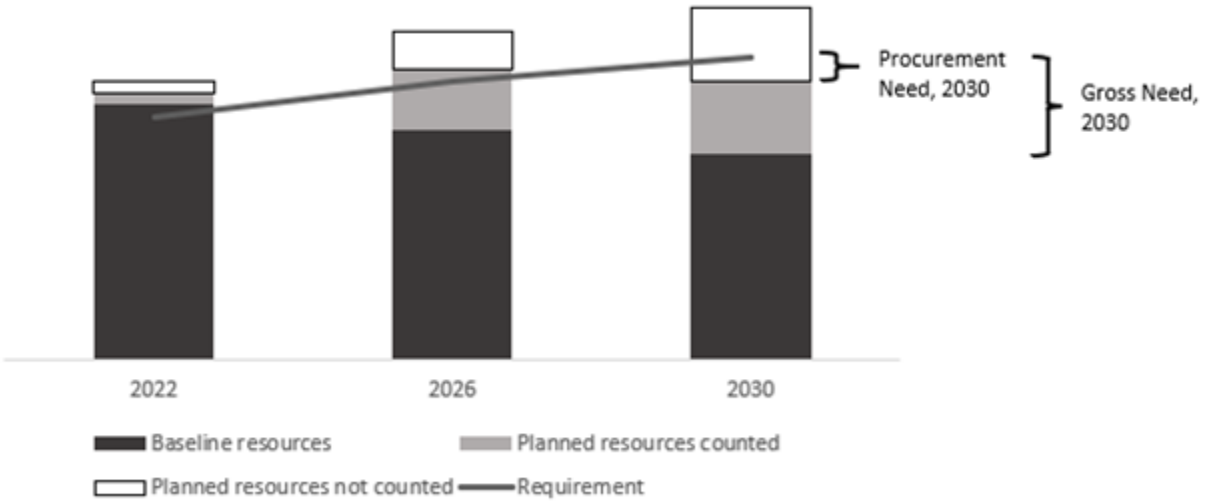
	Online Status	**Contracting Status**
Baseline	Currently online and expected to be online in the planning year under consideration	Contracted or uncontracted
	Not yet online	Contracted
Planned	Not yet online[21]	Uncontracted but included in LSEs' individual IRPs. The significant uncertainty associated with some of these resources may warrant them not to be "counted" when determining procurement need.

[20] Where "requirement" is forecast peak load plus a planning reserve margin, "baseline" is the effective capacity of online and contracted-to-be-online resources less those assumed to retire, and "planned" is the effective capacity of LSE-planned resources, with some discount applied to account for the uncertainty of these uncontracted resources coming online.

[21] Note that although not significant for the purposes of this section, Filing Requirements for LSEs' IRPs also allow online units to be included as planned resources, so LSEs can indicate their intent to contract with a unit when it comes off its current contract.

In the following chart a hypothetical aggregation of baseline and LSE-planned resources is compared to a requirement, for three future years. The y-axis is the cumulative quantity of the resource attribute in focus for the need determination, for example: effective system capacity. The chart is intended to be generic and so could illustrate the determination of procurement need for other resource attributes. The requirement would likely be drawn from the Reference System Portfolio.

Figure 6. Illustration of relationship between required resources, baseline resources, planned resources, and the procurement need



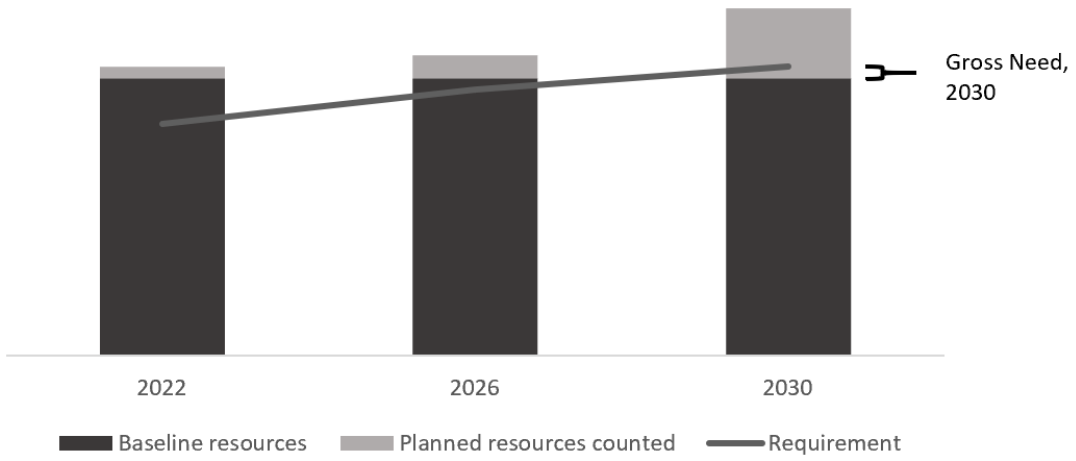
Staff defines the procurement need in its broadest sense as the difference between what is required and what is expected. Need determination could involve counting no value from LSEs' planned resources, in which case the procurement need would be the same as the gross need, or the process could count some value from planned resources, leading to a distinction between procurement need and gross need. This also explains the difference between the planned resources counted and not counted in the chart above. The role of LSEs' plans in determining procurement need is explored further in section 6.4 below.

Staff expects that the degree of urgency of the procurement need could drive how much value to count from planned resources. For a near-term reliability procurement need, the CPUC would likely not assume any planned resources will be online in time and therefore would order the full gross need to be procured. The CPUC could acknowledge the planned resources it observes in LSEs' IRPs that would likely meet the need, to encourage their continued development, but it would not count on them being online. Whereas for a GHG reduction need that is longer-dated the CPUC may assume some portion of the planned resources will be online by then and only order a portion of the gross need to be procured.

In the example chart above, there is a gross need in 2030, of which a portion is a procurement need, which is a likely gap between LSEs' plans and the requirement. In 2026 there is no procurement need, just the gross need.

To illustrate these high-level concepts further, in the next example chart, there is a gross need in 2030 but no procurement need. In 2026 there is no need at all.

Figure 7. Illustration of example where there is no procurement need



In the IRP planning track, LSEs submit information about all of their planned resources in their IRP filings. However, in the procurement track, the viability of those resources may need to be assessed more rigorously to determine what resources are likely to come online. This could result in the procurement need determination differing from the resource need analysis in the IRP planning track.

Other reasons why procurement need determination findings may differ from those of the resource need analysis conducted in the planning track include:

- Timeframes involved - Resource need analysis in the planning track addresses the full planning horizon. However, in the procurement track, in some cases it may be appropriate for procurement needs only to be determined for the near to mid-term (i.e., on a "just in time" basis to retain the value of optionality), whereas in others a ratable procurement approach may be optimal. For example, a procurement need determination may focus on 2024 through 2026, but be only directional for years 2027 through 2030.
- Consideration of commercial interest demonstrated by developers - Processes within the planning track, including updating of resource potential assumptions, and resource-to-busbar mapping, keep planning connected with commercial interest, as indicated by the interconnection queues. For determining procurement need, however, it may not be appropriate to assume any uncontracted resources will be developed without LSE or CPUC-initiated procurement.
- Procurement need determination not necessarily needing to be prescriptive about resource type (see the related guiding principle in section 2.4 above).

Staff notes the approaches used in LTPP, IRP's predecessor process, as additional important background when considering procurement need determination in IRP. In LTPP need was determined by conducting a stack analysis, and with the CAISO and IOUs contributing production cost modeling. The problem being solved for was substantially different because the composition of the generation portfolio included much fewer variable renewable resources than currently, and the majority of the load was served by the three IOUs. Further, LTPP was focused primarily on ensuring sufficient generation resources to meet the

Integrated Energy Policy Report (IEPR) demand forecasted, whereas IRP seeks to optimize both supply and demand-side resources. Accordingly, the objective of LTPP need determination was generally to identify the amount of new thermal generation necessary for reliability. Also due generally to the amount of capacity available, a loss-of-load-expectation (LOLE) study or an ELCC study were not required at the time.

Similarly, D.19-11-016 ordered reliability-driven procurement based on need determined by a stack analysis at the system level.

6.2. Drivers of Need

This section explores the various drivers of need relevant to IRP to set up discussion of the potential analytical approaches relevant to each in section 6.5.

6.2.1. Reliability Need

The IRP Procurement Framework needs to allow for consideration of all existing forms of reliability need including system, local, and flexible, as well as being adaptable to any revisions in how reliability is defined.

A system reliability need exists in a particular future year, or other time period, where resources are not sufficient to meet system-level resource adequacy needs to a reliability standard across a range of system load, weather, and resource supply conditions.

Determination of local reliability need follows a similar concept but applied at the local area level, where "local areas" are defined by where load is met with a relatively high reliance on particular resources, due to transmission constraints. Local reliability has its own unique set of conditions under which need is assessed (i.e. under specific transmission contingencies).

When assessing the reliability need staff expects to consider the following factors:

- What is the appropriate load forecast that should be used in the analysis?
- What assumptions should be made about existing resources, including the thermal fleet? How should existing generators not contracted for, but without a publicly announced retirement plan, be accounted for?
- What test should be used to assess whether a portfolio is reliable?
- What assumption should be made about RA qualifying imports?
- How should local reliability needs be accounted for?
- What are the implications of increasing penetrations of variable renewable energy and storage on conventional approaches for determining reliability needs?
- Does the need for system flexibility or ramping create additional procurement need beyond that needed to serve system and local reliability?

6.2.2. GHG Reduction Need

The need determination should aim to answer the following question:

- What procurement should the CPUC act on to ensure the CPUC-adopted GHG planning target for the electric sector is met?

RESOLVE can be used to analyze resource needs to meet specific GHG targets under various future conditions. The Reference System Portfolio, by design, identifies the optimal composition of CAISO system resources required to meet the GHG planning target adopted by the CPUC pursuant to SB350. That portfolio can serve as a point of comparison to determine whether there is a need for additional procurement to meet GHG reduction needs.

The current method in the IRP planning track for determining whether each LSE is meeting its GHG reduction requirement involves using the Clean System Power calculator. Staff assumes that a portion of the resources identified under the GHG reduction need determination will be procured without additional CPUC action. GHG-free renewables such as solar and wind have been procured by all LSE types under the Renewable Portfolio Standard and other existing CPUC programs. Additionally, state mandates and CPUC programs have led to regular procurement of distributed resources and battery storage.

Therefore, this Procurement Framework should focus on answering:

- How will GHG reductions planned for in LSE plans be measured and/or enforced to meet GHG goals in a timely manner?

6.2.3. Other Drivers of Need

Staff suggest that this Procurement Framework should also address how the need for resources to meet requirements other than reliability and GHG reduction should be determined. Such requirements may include renewables integration, resiliency benefits achieved through resource diversity, or where a combination of requirements cannot be assessed using pure reliability or GHG-oriented approaches.

6.3. Specificity of Need

Whether stemming from reliability, GHG reduction, or other drivers of need, procurement need should be stated in as general terms as possible in order to follow the guiding principles described in section 2.4 above. Where possible, the need should be defined by its attributes or the services that it provides. The CPUC should aim to keep the type and location for the need as broad as possible to access the benefits of competitive processes and avoid the risk of market power abuse. This section, however, explores situations where it may be appropriate to specify the need to some degree. Staff expects broad reasons for this to be where:

- The planning track of IRP indicates that a material amount of long lead-time, large-scale, pre-commercial technologies,[22] or any new generation resources dependent on new transmission, are highly likely to be required to meet needs at least-cost.
- The need is driven by such particular circumstances, or is of such urgency and/or location, that "all source"-style procurement processes are unlikely to deliver what is required.

[22] As allowed for by PU Code section 454.52 (a)(2)(B)

6.3.1. Large, Long Lead-time and other "Non-Routine" Resources

Long lead-time and/or large-scale resources may not be any one LSE's preferred option for meeting reliability or GHG procurement needs due to their lumpy nature.[23] However, at a system level, a large, long lead-time resource may be found to be the optimal resource option. In such cases, a procurement order may point specifically to a large, long lead-time resource type to enable collective action. The CPUC identifies[24] long-duration storage, offshore wind, geothermal, and out-of-state renewables as examples of long lead-time resources. Staff believe that this CPUC guidance is self-explanatory except that, depending on the technology and size of individual resources, long-duration storage may not have a long lead-time to bring online. Staff expect that future guidance may need to take a different form.

For "non-routine" resources, the reliability and GHG need determinations described above should be complemented by consideration of the following questions:

- What are the cost-effective resources that can potentially help fill the system need (reliability, GHG, or a combination) but may not be procured due to market failures?
- What are the resources that can potentially help fill the system need (reliability, GHG, or a combination) and offer other benefits not represented quantitatively in capacity expansion modeling, but may not be procured due to market failures?
- How do the resources identified by answering the two questions above compare across various futures? What resources are "least-regret" based on weighted risks considered?
- What resource(s) should the CPUC facilitate a procurement process for? By what amount and when?
- What emerging technologies, if any, should the CPUC facilitate development of through procurement orders?

Further, staff expect that there are a broader range of resource types, whether in- or out-of-state, that may require transmission upgrades that are significant enough for the resource to be considered "non-routine" in a procurement context.

6.3.2. Resources Requiring Transmission Development

Some procurement may require a higher level of need determination because of an interdependence between resource and transmission development. Although the Transmission Planning Process (TPP) managed by the CAISO and the CPUC's electric transmission permitting process are mostly outside of the scope of this framework, resource

[23] "Lumpy" resources are those that only come in large MW increments; for example, a 500 MW pumped storage facility or a 2,000 MW offshore wind facility. Historically, large, lumpy resources have been developed only by large LSEs, or via complex, collective agreements. For example, the San Onofre Nuclear Generating Station, SONGs, was developed by SCE, SDG&E and a small number of municipal utilities – ultimately a number of LSEs shared the risk and benefits of the long-lead time resource.

[24] D.20-03-028 and R.20-05-003 Assigned Commissioner's Ruling and Scoping Memo September 24, 2020 https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M347/K608/347608446.PDF

planning and procurement must be conducted in tandem with transmission planning to solve for the following key challenges.

In the IRP process, RESOLVE uses transmission capability limits and upgrade cost estimates developed by the CAISO to identify where new transmission development would be required to accommodate the resources selected in a portfolio. Staff has found that as the GHG targets decrease, transmission development becomes increasingly necessary for large quantities of new resources to be selected. New transmission development may also be necessary within CAISO or outside of CAISO to allow for larger amounts of out-of-state resource imports in the future.

In the PSP development process, CPUC staff aims to ensure that identification of need for new transmission is substantiated by LSEs. An LSE may include in their IRP plans a new resource that would require an upgrade to transmission not identified as needed in the RSP. However, if it does, the LSE must justify in its LSE plan the cost, timeline, and risks associated with the transmission upgrades and must communicate that it is actively planning for the upgrades.[25]

In order for the CAISO to conduct rigorous transmission planning, the CAISO must include in its TPP studies only new resources that are near certain to come online, and they must be mapped to specific busbars over a 10-year horizon. Staff needs to determine how this detailed information can be transmitted to the TPP in the future when the majority of new resources procured will be variable output renewables and storage, differing greatly from the thermal generation that was planned for under LTPP and transmitted to TPP accordingly. With resources such as battery storage, which are extremely flexible in siting and relatively quick to develop, it is not possible to predict the exact location of battery development over a 10-year horizon. The IRP process, to date, does not necessarily contain compliance or enforcement mechanisms to ensure that resources are actually procured at the planned-for locations transmitted to the TPP and assumed in the CAISO-approved annual Transmission Plan.[26]

Generation developers seek certainty about transmission access in order to progress projects, while transmission developers seek certainty about commercial generator interest in a specific location before moving forward with development. The policy-driven TPP assessments, designed to solve this "chicken or the egg" problem, provide an opportunity for the CPUC to indicate a resource procurement future requiring transmission development, without the need for resource contracts to be executed first. If transmission upgrades identified by CAISO staff, when assessing the policy-driven base case, are approved by the CAISO Board of Governors, this creates substantive certainty in regards to the development of the transmission necessary to accommodate the policy-driven resource development. This policy-driven TPP process also reduces the project development costs for generation developers by socializing the costs of the transmission upgrades. However, the policy-driven transmission approval process, in turn, requires that the accompanying

[25] 2019-2020 IRP Filing Requirements, Narrative Template Section III j. ftp://ftp.cpuc.ca.gov/energy/modeling/Narrative%20Template.docx

[26] These issues are explored in the "Ruling Seeking Comments on Portfolios to be Used in the 2021-22 Transmission Planning Process" available at: https://www.cpuc.ca.gov/General.aspx?id=6442466555

generation resources be developed in order for the socialized costs to lead to benefit for ratepayers.

This Procurement Framework should strive for optimal procurement across various needs and resource types, so that the CPUC IRP process can better inform transmission planning and in turn, ensure that any required transmission will be developed in time for the generation resources required to serve load.

For this reason, the reliability and GHG need determinations described above should be complemented by consideration of the following questions:

- What transmission must be online, by when, and where, in order to accommodate the procurement of the planned-for resources?
- What resources must be online, by when and where, in order to complement approved policy-driven transmission development?

Answers to the above questions may drive procurement orders in the future that ensure resource and transmission procurement are well aligned investments that minimize ratepayer costs while meeting other state goals.

6.3.3. Resource Portfolio Diversity

If the state's resource portfolio becomes skewed heavily towards a few resource types, the CPUC may seek to increase resource diversity as a risk hedging mechanism. For example, this may occur if, in order to minimize ratepayer costs, only resources that do not require new transmission are included in the portfolios, thereby excluding offshore wind, out-of-state wind, or other large resource developments. This can be addressed by the CPUC ordering procurement of a specific resource type or supporting transmission towards a specific zone to spur development. The reliability and GHG reduction need determinations described above should be complemented by consideration of the following questions:

- How exposed is the resource portfolio to volatility in prices and other risk factors?
- How can procurement improve the ability of the system to respond to volatility in prices and other risk factors?
- Will the potential procurement order, if it considers reliability need and GHG-based need alone, limit the ability to respond to new state policies in the future?
- Will the proposed procurement strategy limit the ability to respond to newly available resources, projects, or technologies in the future?
- Will the proposed procurement strategy result in long-term commitments that have a high probability of exposing ratepayers to stranded costs in the future?

Stringent GHG targets may drive the need for new resource technologies to replace both the energy and capacity provided by the existing gas fleet. To run the grid without the benefit of fossil resources, even largely in standby mode, is a complex and investment-intense undertaking. Future IRP analyses that consider deeper GHG reductions beyond 2030 may need to explore the role of relatively immature technologies in creating a zero- or near-zero carbon grid, including biomethane, ultra-long duration or seasonal storage, renewable-based

hydrogen burned in existing thermal facilities, and natural gas combustion with carbon capture and sequestration.

Due to their pre-commercialization stage of development, but also promising ability to meet reliability or GHG needs, it is possible that procurement of one or more of these technologies may be required. The need determination process must consider the qualitative benefits and risks associated with specifically requiring procurement of these relatively untested resource types, as compared to allowing individual LSE procurement of more well-known resources, or an "all source" request for offers (RFO) on behalf of a larger group of LSEs.

6.4. Role of LSEs' Plans in Determining Need

LSEs' preparation and filing of individual IRPs is a central feature of the planning track of IRP, with important implications for the procurement track. This Procurement Framework seeks to clarify the role of LSEs' "planned" resources in particular, as distinct from "baseline," as defined in section 6.1.

LSEs' planned resources present a significant degree of uncertainty when assessing procurement need. Planned resources are each at different stages of contracting and/or development. In the IRP planning track, LSEs submit information about all their planned resources in their IRP filings. However, in the procurement track, the feasibility of those resources may need to be assessed more rigorously (or simply discounted) to determine what resources are likely to come online. As introduced in section 6.1 above, this could result in the procurement need determination differing from the resource need analysis in the IRP planning track.

Potential approaches to determining procurement needs described in section 6.5 below should all take baseline resources as fixed inputs, whereas planned resources require more nuanced consideration. The following features of planned resources are central to this:

- **Strength of LSEs' preference for resource type and location -** Filing Requirements for LSEs' IRPs allow planned resources to range from generic resources, with only type, nameplate capacity, and deliverability status identified, to those with transmission zones and even interconnection queue positions specified.

- **Viability -** Given the above, planned resources can vary significantly in terms of their stage of development and the level of certainty about their projected type, size, and location. Key indicators of viability include status of site control, permitting, interconnection, technology selection, developer and operator experience, and financing status.

- **Robustness of procurement plans** - Resources may be similar in terms of the strength of LSEs' preferences and viability yet should be considered differently in a need determination context if LSEs' plans to manage procurement risks vary significantly. LSEs' individual IRPs should enable assessment of the likelihood of

planned resources coming online as expected, considering risks involved in development, programs, markets, and procurement. Such assessment links to the determination of which resources are "routine" and not typically requiring procurement to be ordered in IRP, and which are "non-routine."

6.5. Options and Enabling Actions for Procurement Need Determination

Staff puts forward a range of options for addressing the various issues raised in the sub-sections above. In many instances, options are complementary rather than mutually exclusive. Staff conclude (in section 6.6) by recommending a combination of options believed to be optimal. Staff continues this approach of describing options and recommendations throughout the remainder of this document, up to and including section 10.

6.5.1. General Considerations for Determining Procurement Need

Need Determination – General – Option 1: Conduct need determination regularly, based on a set schedule

Under this option, the process of determining reliability, GHG reduction, or other-driven need would be conducted by the CPUC at a regular interval, either time-based or associated with the IRP proceeding schedule. For example, this could be scheduled annually, or as part of the development of the Reference System Plan and Preferred System Plan.

Need Determination – General – Option 2: Conduct need determination on an event-driven basis, triggered by certain criteria

Conditions relevant to procurement decision-making would be monitored and if certain criteria are met, indicating potential procurement need, the process of need determination would be triggered in order to confirm this. Staff suggests the criteria be associated with: i) the gap between the system peak load forecast plus planning reserve margin (PRM) four years ahead, and the net qualifying capacity (NQC) expected to be online at that time, ii) the gap between the new resources in the optimal portfolio adopted by the CPUC in the planning track and the baseline exceeding a certain amount in any year within the next four years, and iii) the proportion of non-routine resources in the adopted portfolio in the planning track exceeding a significant level within the next six years. To be effective, the monitoring for relevant events (e.g., material changes in publicly available indicators of industry conditions, such as announced retirements, load forecasts or wholesale market prices) must require significantly less time and effort than conducting a need determination itself.

The CPUC could adopt either *Need Determination – General – Option 1: Conduct need determination regularly, based on a set schedule*, or *Need Determination – General – Option 2: Conduct need determination on an event-driven basis, triggered by certain criteria*, or both.

6.5.2. Reliability Procurement Need Determination

In this section staff describes a range of options to quantify the difference between the requirement for reliability attributes at the system level in future years, and the reliability attributes expected to be available, to determine the need for reliability procurement.

Whether the difference between what is required and what is expected constitutes a reliability procurement need will depend on factors including:

- If it is due to discounting the capacity of planned resources using "viability factors" for typical development risks for resource types and sizes that LSEs have a track record of successfully procuring, given current markets and programs. If so, this would indicate that CPUC action may not be required.
- If the difference is due to a lack of consistency between the LSEs' plans, in aggregate, and the assumptions used to calculate the system-level requirement. The lack of consistency may indicate some assumptions are out of date, or that there are other differences, related to objectives, risk tolerance, or other fundamental matters of perspective.
- If the difference is comprised of some combination of "non-routine" resources. If so, this would indicate that CPUC action is required to ensure resources are procured collectively, or on behalf of a collective of LSEs.

These factors will impact not only whether there is a procurement need but the appropriate CPUC action to take to address the need, ranging from a procurement order, to establishing a new resource program, to making changes to existing programs or markets.

Need Determination – Reliability – Option 1: Conduct using gap analysis with Reference System Portfolio or Preferred System Portfolio

For each planning year, subtract the sum of planned resources (as defined in section 6.1 above) from the new resources selected in the Reference System Portfolio[27] and adjust for updates in the baseline resources and changes in key assumptions (for example, if a new load forecast has been released).

The gap is expressed in terms of nameplate capacity, by resource type. To follow the guiding principle of technology-neutrality, this could be converted into ELCC values using the assumptions from the RSP.

Need Determination – Reliability – Option 2: Conduct using the method used for D.19-11-016

The need determination approach associated with D.19-11-016 can be summarized as comparing the load requirement with the existing baseline resources:

[27] The RSP is used for the purposes of explanation, but the approach could be applied using the PSP, depending on the stage of the IRP cycle at which the need determination is made; i.e., the most recent system portfolio would be used.

- Requirement: 2018 IEPR 1-in-2 Mid Demand Baseline Case, Mid Additional Achievable Energy Efficiency and Additional Achievable Photovoltaics Case peak load forecast plus 15% PRM
- Less baseline resources assuming NQCs per System RA program, with no value placed on LSE-planned resources.

Need Determination – Reliability – Option 3: Conduct stack analysis using updated system requirement and current ELCCs

Similar to above, the system requirement under this approach is the peak load forecast plus a planning reserve margin. However, the planning reserve margin, in terms of system capacity, is set by running a PRM target study: conduct reliability analysis to find the margin that results in a LOLE no higher than 0.1.[28]

The capacity value from the baseline and planned resources is calculated by applying the ELCC assumptions from the most recent system portfolio.

For each planning year, the capacity shortfall is found by subtracting the capacity value of the baseline and planned resources from the system requirement.

Need Determination – Reliability – Option 4: Conduct using an LOLE analysis to update all inputs

Similar to above, but rather than apply exogeneous ELCC assumptions to the baseline and planned resources, take more time and effort to calculate updated ELCCs by resource type.

An alternative to this is to calculate the system need directly from a loss of load probability model capacity shortfall. This implicitly or explicitly calculates the portfolio ELCC but does not provide ELCCs by resource type. Resource type-specific ELCCs are required for some of the need allocation options discussed in section 7.1.

For each planning year, the capacity shortfall is the difference between the system requirement and the total ELCC value of the entire portfolio.

The following table compares these analytical approaches for conducting reliability need determination if performed prior to approximately mid-2021:

[28] An LOLE of 0.1 means that it can be expected that system load will not be met once in every 10 years

Step	Need Determination – Reliability – Option 1: Conduct using gap analysis with Reference System Portfolio or Preferred System Portfolio	Need Determination – Reliability – Option 2: Conduct using the method used for D.19-11-016	Need Determination – Reliability – Option 3: Conduct stack analysis using updated system requirement and current ELCCs	Need Determination – Reliability – Option 4: Conduct using an LOLE analysis to update all inputs
1. Calculate load and reserve target	Not applicable	2019 IEPR + PRM	2019 IEPR + PRM, updated so that LOLE is no higher than 0.1	2019 IEPR + PRM, updated so that LOLE is no higher than 0.1
2. Calculate capacity value from baseline and planned resources	Not applicable	Calculate total ELCC of baseline resources based on existing NQCs per System RA program	Calculate total ELCC of baseline resources + planned resources based on ELCCs per the 2019-2020 RSP	Update production cost model used for 2019-2020 RSP with latest baseline and planned resources, to update ELCCs by resource type
3. Calculate system capacity shortfall	Delta between new resources in 2019-2020 RSP and planned resources, adjusted for baseline updates and the 2019 IEPR (nameplate capacity by resource type by year)	Delta between results of Step 1 and 2 (capacity value by year)	Delta between results of Step 1 and 2 (capacity value by year)	Delta between results of Step 1 and 2 (capacity value by year)

Need Determination – Reliability – Option 5: Conduct both energy and capacity-based reliability analyses using resource sufficiency assessments

This approach, proposed by stakeholders in Track 3 of the RA proceeding,[29] is an alternative to the reliability need determination methods described above via *Need Determination – Reliability – Options 1 through 4*. It involves the CPUC conducting three resource sufficiency analyses to address the growing significance of energy availability to serve load, as well as capacity to meet peaks, as the penetration of variable renewables and storage increases:

- Net peak load capacity sufficiency assessment – identify for which months in the planning horizon, if any, there are insufficient resources to meet net peak load (gross peak load minus expected wind and solar generation) plus a planning reserve margin.

[29] *Southern California Edison Company (U 338-E) and California Community Choice Association's Track 3 Proposal* in R.19-11-009, August 7, 2020

- Net energy need sufficiency assessment – check for months, if any, where the expected net load exceeds the available energy from non-wind and solar resources.
- Energy storage charging energy sufficiency assessment – check for months, if any, where the energy needed to charge storage sufficiently to deliver its assumed capacity value is not expected to be delivered by the other resources.

To the extent issues are identified by these three alternative resource sufficiency checks, it should be possible to quantify the reliability need, considering the frequency and extent of exceedances, their seasonality, and what resource attributes may address them.

All three of these assessments would be robustly conducted as part of the CPUC performing LOLE analysis anyway, because such analysis measures instances of load not being met due to these reasons across an even wider range of load, weather, and resource supply conditions. Unlike some of the LOLE-based analyses, however, the assessments in this option can be directly applied at the LSE level, thereby linking to need allocation, discussed in section 7.1 below. Staff expects that the disadvantage of this option, however, is that it is significantly different to the approach that the RA program and IRP process currently takes to measure how loads and resources account for reliability.

6.5.3. GHG Reduction Procurement Need Determination

Need Determination – GHG Reduction – Option 1: Use LSE-specific annual GHG limits to assess compliance

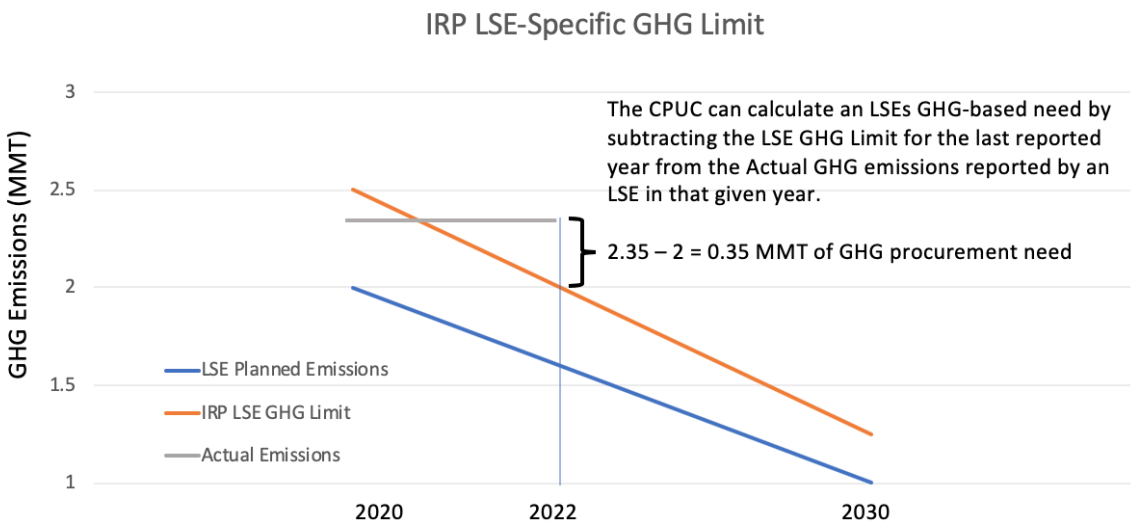
Use LSE-specific annual GHG limits as a standard to assess LSE portfolio emissions and determine whether the LSE should be ordered to procure resources to further reduce its own GHG emissions.

Currently California's electric sector GHG reduction goals are set for 2030 and 2045. These sparse targets can create the perception that ample time exists to procure resources to meet these distant GHG reduction targets. Annual limits within the IRP planning horizon, rather than just each LSE's 2030 GHG benchmark, will allow staff to monitor progress and determine whether corrective action is required to meet the long-term GHG target.

Annual GHG limits can be developed using a two-step approach:

1. Develop a straight line from most recently available actual annual emissions to an existing GHG emissions reduction target, such as that in 2030.
2. To allow for a degree of LSE procurement flexibility and LSE course correction due to variation in load, permit the GHG emissions to be higher, up to a designated amount, than the annual GHG emission targets identified under step one. In this case, the expected GHG emissions of the aggregate portfolio or individual LSE portfolios will be compared to the annual limit to determine whether there is a GHG reduction-based procurement need, though each individual LSE's actual GHG emissions relative to their target would be tracked for ultimate true up.

Illustrative Example of LSE-Specific Annual GHG Limit
In the example below, the IRP GHG limit is set at 25% over the straight-line approach to the 2030 target. In this example, the LSE has not reduced its emissions since 2020. In 2020 its emissions were under the limit, however, now it is 2022, and the emissions are over the limit.



Need Determination – GHG Reduction – Option 2: Use a clean resource standard

As an alternative to *Need Determination – GHG Reduction – Option 1: Use LSE-specific annual GHG limits to assess compliance* above, a more comprehensive "clean resource standard" could be used. This standard would require development of quantifiable metrics and procedural compliance programs to ensure achievement of existing or future GHG reduction and carbon-based targets, as well as related criteria air pollutant reduction policy goals. This standard could extend beyond the 2030 GHG emissions reduction goal and align with the SB100 2045 carbon-based target. Since it is important for LSEs to be able to hedge against load variation, this standard could include compliance periods of a few years, similar to the existing RPS program. One potential implementation of a clean resource standard could include a designation of allowable carbon emissions intensity for the total MWh sold by each LSE over a compliance period. Another potential implementation could include a more simple approach of developing a compliance period target percentage of retail sales that must be either RPS-eligible, hydro, or nuclear, per greenhouse gas accounting concepts considered under SB100.[30] Whether this or a similar standard is developed or implemented within IRP or elsewhere, the IRP procurement track could use an SB100-driven standard to determine procurement need.

Furthermore, this standard can be designed to determine the need for procurement to reduce criteria air pollutant emissions. For example, the standard can in part be based on

[30] https://efiling.energy.ca.gov/getdocument.aspx?tn=234532

other IRP work conducted regularly. Staff is now using policy objectives, such as minimization of criteria pollutant emissions in disadvantaged communities, to guide the process of mapping IRP resource portfolios to specific busbars (for transmittal to CAISO as an input to the TPP). The resulting mapping of the resources, for which transmission development is then planned by the CAISO, may drive future LSE planning and procurement requirements or incentives. For example, to incentivize procurement of these resource, the CPUC could establish a process by which planned resources in LSEs' IRPs can prequalify as clean resources, if they submit required information. If pre-qualified, these resources can then apply to be considered for a clean resource standard cost recovery program.

6.5.4. Procurement Need Determination for Large, Long Lead-time Resources

Staff recognizes the need to procure large, long lead-time resources would be identified to some extent by reliability or GHG reduction drivers, and therefore outlines options to complement the approaches described above:

Need Determination – Large, Long Lead-time Resources – Option 1: Use sensitivity analysis to determine technology-specific need

This option would complement the general approach of procurement direction being attribute-oriented rather than technology-specific, with targeted sensitivity analysis. Such analysis involves using latest information on resources including offshore wind, pumped hydro, geothermal, and out-of-state resources, to identify which resources are cost-effective, can potentially fill the need, but which the CPUC could determine are unlikely to be procured by LSEs due to market or other barriers. A number of sensitivities would be run, reflecting a wide range of futures, including those where each resource type of interest is systematically made unavailable for selection, and then "forced in." Results would be used, along with a "least regrets" decision-making framework, to determine the type, amount, and timing of large, long lead-time resources that should be part of CPUC-directed collective procurement driven by reliability or GHG reduction need.

A market test, involving soliciting information from industry on current conditions, would be performed in conjunction with the sensitivity analysis. This testing, which could be performed via the Requests For Information described in section 9, would help confirm cost and other key assumptions, but also contribute qualitative insights associated with the supply chain, development, and other risks of procuring large, long lead-time resources. The CPUC could order one or more LSEs to spearhead the testing.

Need Determination – Large, Long Lead-time Resources – Option 2: Develop a decision-making approach for determining what emerging technologies should be included

Non-routine resources, such as those included under *Need Determination – Large, Long Lead-time Resources – Option 1* above, require a tailored analytical approach due to the fact that their benefits as well as risks may be difficult to quantify. However, specific circumstances, such as falling behind on achievement of the GHG target, or the rapid commercialization of a new technology, may result in a scenario where the procurement track may need to assess

the ability of an emerging technology, one for which there has not been time to specifically consider in the planning track, to fulfill procurement need.

Resource types currently not considered in the IRP planning track may become cost-effective under the GHG reductions required to meet the state's 2045 objectives. This includes resources with the potential to provide carbon-free dispatchable power to replace existing plants that burn natural gas, such as small modular nuclear reactors, gas with carbon capture and storage, biogas, hydrogen, or other power-to-gas storage applications.

Staff will develop a decision-making approach for determining what emerging technologies should be included in the analysis of which large, long lead-time resources can satisfy the identified reliability and GHG-based needs.

6.5.5. Enabling Actions to Support Procurement Need Determination

Staff finds that the CPUC can implement various enabling actions to support an effective procurement framework, likely regardless of the combination of options ultimately adopted. Staff believe the following enabling actions to be relevant to need determination.

Need Determination – Action 1: Apply "viability factors" to planned resources

As flagged in section 6.1 above, there are options associated with how much of LSEs' planned resources to count when determining need. The features of planned resources described in section 6.4, including viability, and the specificity and robustness of LSEs' plans, could be taken into account to arrive at "viability factors" to apply to the nameplate capacity of planned resources. Rather than assuming 100% of planned resources will come online as projected in LSEs' plans, a viability factor ranging from 0% to approximately 95% should be applied to each resource. The resulting discounted nameplate capacities of planned resources should be used when determining if there is a procurement need.

Depending on the stage of the planning cycle at which a procurement need is being determined, it may be necessary to also consider the aggregation and deficiency correction amendments staff make to develop the Preferred System Portfolio using LSEs' individual IRPs. Resources that get added by staff to correct deficiencies during this process, if any, could be assessed with a similar approach to that applied to planned resources. By definition, such resources would not be the subject of LSEs' preferences nor procurement plans, and so it is likely that little to no value should be placed on them when determining procurement need.

Need Determination – Action 2: Establish standard estimates for length of procurement process based on resource characteristics

Develop standards for the estimated duration of time required to procure various resource types, from initial solicitation to online date. Staff would then apply these estimates to determine when a "routine" resource identified in an RSP or a PSP may need to be elevated to one requiring inclusion in a procurement order due to LSE inaction.

Need Determination – Action 3: Ensure that the IRP filing requirement planning standards reflect the need determination standards

In order for need determination to be efficient and effective, LSEs need to know what standards they will be measured against. This would allow LSEs to evaluate during their individual IRP development process whether they are complying with all the RSP needs and whether they can expect to be ordered to procure anything additional. Filing requirement planning standards will reflect as many of the need determination standards as possible.

Need Determination – Action 4: Improve alignment between inputs and assumptions used in the IRP and RA programs

The IRP procurement track plays an important role in ensuring that new resources are built in a timely manner so that the capacity is available when required, to comply with resource adequacy requirements. Maintaining a reliable system through procurement is one of the identified objectives of this Framework. This cannot be achieved if inconsistencies in assumptions indicate adequate planning through the need determination lens of one program, and inadequate procurement through the lens of the other.

Input and assumption inconsistencies that should be evaluated include:

- Power plant retirements and contracts that are rolling off
- RA import assumptions
- Load assumptions
- PRM assumptions
- ELCC methodologies and assumptions
- Local capacity requirement assumptions
- Distributed energy resources (DER) treatment
- Time periods for which planning is based on (i.e., monthly vs. annual/seasonal)

Need Determination – Action 5: Establish a permitting preassessment process

Establish a permitting preassessment process that aims to avoid the ordering of procurement of resources that rely on the development of transmission that is later blocked by the permitting process, resulting in stranded resource investments.

If it is known that an identified resource need will require development of new transmission, a permitting preassessment would be conducted in collaboration with California Environmental Quality Act (CEQA) staff to determine whether transmission development is possible, based on pre-established criteria. This process will minimize the risk of the permitting process and/or CEQA later pointing to fatal flaws with the required transmission, resulting in delays in the resources coming online, or sunk costs if resource

development in a specific area must be abandoned due to infeasibility of transmission development.

The CPUC IRP process transmits resource portfolios to the CAISO that are used as an input to the CAISO TPP. Some transmission projects identified in the TPP come to the CPUC for a permit, e.g. Permit to Construct (PTC) or Certificate of Public Convenience and Necessity (CPCN), and the permit application triggers CEQA review. If approved, the projects get constructed and eventually costs go into rate cases, and then rates. However, it is possible that the permitting process can identify either environmental issues with no options for mitigation, or a lack of need for the project.

Out-of-state resources that require development of new transmission outside of the CAISO system present similar risk. However, developing such transmission requires a potentially more complex process involving the other Western Planning Regions involved in Interregional Transmission Coordination, per the Federal Energy Regulatory Commission (FERC) Order 1000.[31] Additionally, permitting processes for transmission development can vary across states. The CPUC may need to develop a similar preassessment process for transmission development shown as necessary outside of the CAISO system.

Criteria will be developed to trigger the permitting preassessment. Criteria may include:

1. RESOLVE indicated a need for new transmission development
2. One or more LSEs included a justified need for new transmission development in their IRP Plan
3. The PSP aggregation process demonstrated the need for new transmission development
4. New circumstances have resulted in the need for new transmission, (e.g., battery storage costs do not decrease as rapidly as predicted and new out-of-state wind is required)

Because permitting preassessments will be location driven, the CPUC will have to determine how the pre-assessment process will impact the locational specificity of procurement orders, and whether procurement orders will speak directly to the reliance on new transmission development.

6.6. Recommendations

Staff conclude this section by recommending the proposed optimal combination of options. Staff splits its recommendations into two time periods: the current IRP cycle, including development of the Preferred System Plan through to approximately the end of 2021 (Phase 1); and the period commencing with the next IRP cycle, starting in 2022 (Phase 2). This allows for maturing of the Framework over time, acknowledging that some options will

[31] The FERC Order is available here: https://www.ferc.gov/sites/default/files/2020-06/OrderNo.1000-B.pdf Information related to ongoing coordination available here: http://www.caiso.com/planning/Pages/InterregionalTransmissionCoordination/default.aspx

require longer to implement than others. This approach is repeated for each section up to and including section 10 of this document.

Phase 1: For use through the end of 2021

Staff recommends the following options be used for Phase 1:

Need Determination – General – Option 1: Conduct need determination regularly, based on a set schedule: A procurement need determination should be performed as part of the upcoming development of the PSP in 2021, and on a regular schedule thereafter, as part of each RSP and PSP. This is consistent with the existing IRP process design.[32]

Need Determination – General – Option 2: Conduct need determination on an event-driven basis, triggered by certain criteria: In addition, staff recommends the upcoming retirement of DCPP as a reason for a need determination to be performed prior to the PSP, due to the potential urgency of replacing such a large provider of system reliability.

Combination of **Need Determination – Reliability Option 2** and **Option 3**, and **Need Determination – Large, Long Lead-time Resources – Option 1**: Of the various reliability need determination options, staff recommends the approach used for D.19-11-016 (*Need Determination – Reliability Option 2*) be improved by:

- Considering a higher load forecast or PRM, using either existing analysis or a new target PRM study via LOLE analysis, due to the changing loads, weather patterns, operating reserve needs, and resource mix since the current standard of 15% was established (*Need Determination – Reliability Option 3*). Staff sees the rotating outages of August 2020 as providing further support for this.

- For baseline resources, using the ELCCs by resource type per the RSP, for a similar reason to above. Ideally, the resource-type ELCCs would be calculated by a full LOLE analysis. However, given the potential urgency of the reliability need, an approach that leverages existing models and results would make efficient use of the analysis already performed to develop the RSP (*Need Determination – Reliability Option 3*).

- Conducting large, long lead-time resource sensitivity analysis (i.e., on out-of-state wind, offshore wind, pumped storage, and geothermal) to identify if any portion of the need should be resource specific, rather than defined simply in NQC terms (*Need Determination – Large, Long Lead-time Resources – Option 1*).

As for D.19-11-016, staff recommends that no value be placed on the planned resources LSEs included in their IRPs given the near-term timeframe of the potential need. There is insufficient time for the uncertainty associated with uncontracted resources not yet online to be monitored, and potentially needing to be replaced if development risks materialize. Staff recommends, however, that if a reliability procurement need is found, that the CPUC gives

[32] Adopted in D.18-02-018 available here: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M209/K771/209771632.PDF. Refer to the Appendices for an updated illustration of the IRP cycle.

guidance to LSEs about the alignment between their planned resources and the need, to help support investment certainty.

Further, staff recommends providing guidance to LSEs regarding ELCCs by resource type, either concurrent with or shortly after a procurement order, to ensure resources procured to meet the determined NQC need are sufficient to meet it.

Finally, staff recommends that any need determination count the resources associated with previously ordered procurement (in this case, related to D.19-11-016) carefully. Refer to section 10 for staff's specific recommendations on this issue.

Phase 2: For use in future IRP cycles

Staff recommends the CPUC adopt a slightly different set of options for Phase 2, defined as starting in 2022, as follows:

Need Determination – General – Option 1: Conduct need determination regularly, based on a set schedule: For the same reasoning as for Phase 1, a procurement need determination should be performed as part of the adoption of each RSP and PSP.

Need Determination – Reliability – Option 4: Conduct using an LOLE analysis: For reliability need determination, a full LOLE analysis should be undertaken so that the PRM and resource ELCCs are based on consistent inputs. Staff assumes that for Phase 2, the extra time and resourcing required from staff and stakeholders for this is justified by the more robust results it should provide.

Need Determination – Action 1: Apply "viability factors" to planned resources: For all types of need determination, including reliability, staff recommends that some value be placed on planned resources, which can be enabled by applying "viability factors." Need determination could be reduced to the extent LSEs have robust plans to develop resources with relevant attributes. The benefit of this approach is that the need determination is less likely to result in redundant procurement being ordered, but this must be balanced against the risk of the planned resources potentially lacking sufficient market or program drivers to be developed successfully. As flagged in section 3.1, the incentives for optimal investment, including from market price signals and regulatory program requirements, may not remain adequate as the electric grid changes. This Procurement Framework should help the CPUC, LSEs, and other stakeholders to identify where CPUC action may be required to best meet the state's objectives.

Need Determination – GHG Reduction – Option 1: Use LSE-specific annual GHG limits to assess compliance: While staff does not recommend any GHG reduction need determination during Phase 1, on the assumption that reliability is the more significant resource driver in the medium term, in Phase 2 the CPUC should develop LSE-based annual GHG limits. This should help prepare the IRP process for the late 2020s, when staff expects the GHG emissions limit to be the binding constraint driving resource selection, based on current IRP modeling. While the RPS program has and will continue to deliver GHG emissions reductions, it is not designed for that sole purpose and for this reason staff recommends that GHG-focused procurement approaches be developed. Staff sees merit in

further exploring *Need Determination – GHG Reduction – Option 2: Use a clean resource standard*, since there is an ongoing joint agency effort to evaluate the 100 percent zero-carbon electricity policy, as established by SB100, staff finds it premature to recommend a standard that would largely be tied to the requirements of SB100.

Need Determination – Large, Long Lead-time Resources – Option 2: Develop a decision-making approach for determining what emerging technologies should be included: Staff also recommends that large, long lead-time resources continue to be analyzed as part of need determination, with the Phase 1 approach being expanded via the development of a decision-making approach for determining what emerging technologies should be considered in the analysis. This will allow this Procurement Framework to be ready to accommodate new technologies, as they emerge and show potential for contributing to meeting the state's 2045 objectives.

Finally, staff reaffirms the value in progressing all the enabling actions (in addition to *Need Determination – Action 1: Apply "viability factors" to planned resources*) listed in the section above, which will be important to support almost any combination of approaches adopted by this Procurement Framework.

7. Procurement Order

7.1. Procurement Need Allocation

7.1.1. Background

The allocation of the responsibility for procurement of the determined need to individual LSEs is a crucial part of this Procurement Framework. This section explores need allocation issues including:

- Whether need allocation should take place as part of need determination, or only as a subsequent step once a procurement need has been identified;
- Whether "causer pays"[33] is a foundational principle for procurement, or if other approaches should be used, depending on the circumstances;
- Consideration of what existing or contracted resources LSEs can count as their resources, thereby impacting the degree to which they are assessed as causing the need for procurement;
- The passing of time between when LSEs procure resources and a subsequent determination of procurement need, and the associated uncertainty about whether the LSEs' procurement was recent enough to count towards the determined need;
- Uncertainty about what future load each LSE is required to serve;
- Risk of inequitable bearing of "stranded costs", as distinct from LSEs managing their supply and demand in the normal course of competitive retail service provision.

These issues predate IRP. The IRP process raises the additional consideration of what bearing, if any, LSEs' planned (not contracted) resources should have when allocating need, as discussed in section 6.4 above.

The Power Charge Indifference Adjustment (PCIA) is also relevant because it may affect the allocation of resource benefits between LSEs. The PCIA aims to ensure that the customers who remain with an IOU do not end up taking on the long-term financial obligations[34] the IOU incurred on behalf of now-departed customers. The PCIA is calculated by taking the difference between the IOU's actual portfolio cost and its current market value.

[33] In this context this principle may be a reason for the CPUC to assign the responsibility for procurement, including the cost, to one or more LSEs that it identifies, according to some criteria, to have contributed via their actions or inactions to the need for the procurement.
[34] Examples of such financial obligations include utility expenditures to build power plants and, more commonly, long-term power purchase contracts with independent power producers.

The PCIA does currently allow CCAs and ESPs to count the benefits of the associated resources to their RA, RPS and other requirements that were procured on their customers' behalf prior to departing from the IOU. However, the CPUC is currently considering a proposal[35] in the Rulemaking 17-06-026 to modify the "portfolio optimization" process to allocate the RA, GHG-free, and RPS resources available for other LSEs to receive credit for on a voluntary basis. If adopted, the portfolio optimization proposal would alter the portfolio positions of LSEs relative to their load share. This may affect the allocation of responsibility for procurement between LSEs.

D.19-11-016 allocated the procurement need of 3,300 MW system resource adequacy capacity to all jurisdictional LSEs based on their forecast share of peak load. This approach avoided the complexity involved with assessing each LSE's portfolio of contracted resources, not just their load. Further, by not being associated with a pre-established compliance requirement, ordering procurement via D.19-11-016 required the CPUC to establish which resources could be considered "incremental" (count towards the 3,300 MW requirement) and which were already assumed to be coming online. The baseline identified for this purpose dated from 2 to 3 years prior to D.19-11-016.

Future allocation of procurement need in IRP will have to navigate similar challenges, though staff expects that by developing the Procurement Framework this can be done more predictably and systematically.

7.1.2. Options for Procurement Need Allocation

General Approaches to Need Allocation

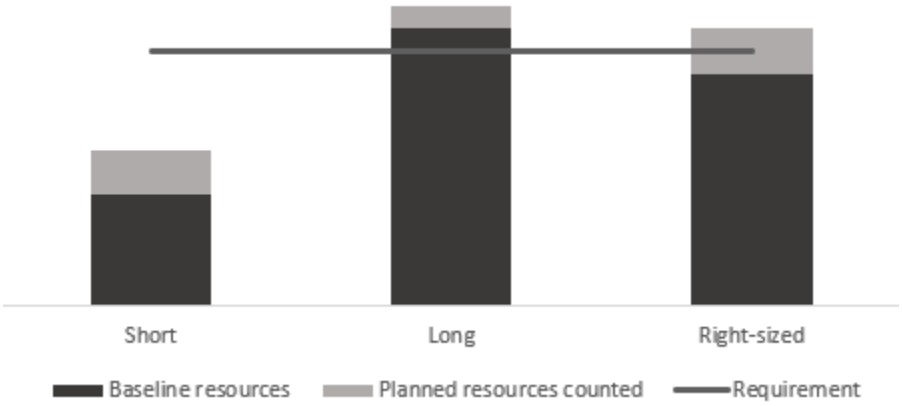
Need Allocation – General – Option 1: Need allocation to LSEs follows need determination

This would involve the determination of need described in section 6.1 above occurring at an aggregate level as applicable (for example, for system reliability need this would be at the system level, whereas local reliability need would be determined at a more granular level). Then, if some form of need is determined, it would be allocated to LSEs based on their proportional contribution to the determined need.

There are three broad positions LSEs can hold, as illustrated by the following chart. An LSE's portfolio may be short of its requirement, it may be long, or it may be right-sized. These positions have also been described as the LSE "leaning," "supporting," or "neutral," with respect to aggregated requirements.

[35] https://cal-cca.org/wp-content/uploads/2020/02/R1706026-Final-Report-of-WG-3-Co-Chairs.pdf

Figure 8.Illustration of possible portfolio positions of an LSE



This option may tend to help avoid redundant procurement. On the other hand, it may perpetuate leaning by some LSEs, and "supporting" by others, which has implications for customer choice, equity, and the risk of cost shifting in the short to medium term. In the long term, it could be argued that eventually the cost advantage inherent to being "leaners" would attract load from the other LSEs. Then, if and when need was determined, a load-based requirement would tend to require procurement by those previously leaning. It is unclear whether this swing of advantage to and from LSEs over time would be in ratepayer interests.

Options regarding pro-rating of procurement need to LSEs:

Need Allocation – General – Option 2: Pro-rate the need based on LSEs' portfolio positions as well as their load shares

The procurement order for LSE "A" would be its gap to its requirement divided by the aggregate gap to the aggregate requirement, multiplied by the aggregated need. LSE A's requirement would be based on its load share.

(i.e., $\frac{G_A}{\sum G_i} \cdot Need$, where G is the gap between an individual LSE's requirement and its position).

The valuing of the individual LSE's planned resources in this assessment should be performed consistently with how they are valued at the aggregate level.

Once need has been allocated, each LSE would demonstrate compliance by showing that its subsequent procurement is "incremental." Incremental resources would be those procured after the LSEs' portfolio positions are measured.

Need Allocation – General – Option 3: Pro-rate the need based only on LSEs' load shares

Same as the above approach, except that LSEs' individual portfolio differences would not be considered. The relative advantage of this is that it is less complex. However, this approach

may be inequitable for LSEs that foresaw the procurement need and already procured the resource attributes identified by the need determination. That is, even the long LSE would be required to procure, which means this approach could disincentivize voluntary LSE forward contracting.

This disadvantage may be manageable if long LSEs are able to sell down their positions to LSEs that are short, without incurring a significant cost of doing so.

Need Allocation – General – Option 4: Need allocation is part of need determination

The broad alternative to *Need Allocation – General – Option 1: Need allocation to LSEs follows need*, is to consider LSE-by-LSE positions as part of the determination of need. In other words, whether there is a need at an aggregate level does not directly indicate whether or not there should a procurement order applying to one or more LSEs. LSEs that are assessed to be short in meeting their portion of the requirement would be ordered to procure even if there is no need at the aggregate level.

The possible methods for this must involve allocating the aggregate requirement to each LSE. This could be via LSEs' load shares (as is done on a year-ahead basis currently in the RA program) or possibly other ways to address the causer pays principle.

There is a challenge with any approach that pro-rates procurement need to LSEs: how to deal with the possibility that LSEs' load shares change after the order is made, due to some combination of customer choice, changes in customers' energy demand in terms of volume or hourly profile, and/or the entry or exit of LSEs.

Specific Options for Need Allocation

Need Allocation – Specific – Option 1: Allocate system reliability need using the load-share method utilized in D.19-11-016

This option, most relevant to a system reliability need, applies the determined need to all LSEs. It takes the year-ahead forecasts for resource adequacy capacity, aggregated by LSE type, to first allocate the need by LSE type, before allocating to individual LSEs by their share of annual electricity load forecast. This balances the principle of seeking to align the need determination and allocation (reliability need using peak capacity-based allocation) with the preference to use publicly available information (load forecasts).

To drive investment in new resources, D.19-11-016 requires LSEs to procure primarily resources that were not online, nor assumed to be coming online, in the need determination. The setting of the baseline resources for defining this, in effect, further allocates the need to LSEs: those LSEs who contracted with eligible resources after the baseline was formed but before the procurement order, have less procurement responsibility than others, all else being equal.

Need Allocation – Specific – Option 2: Allocate system reliability need using a method similar to that utilized in D.19-11-016, but considering LSEs' portfolio positions

This option would take the same approach as *Need Allocation – Specific – Option 1: Allocate system reliability need using the load-share method utilized in D.19-11-016* but then apply a further factor that scales the allocation by how much each LSE's portfolio of baseline and planned resources (discounted as described in Section 6.5 above) reduced the determined need.

Need Allocation – Specific – Option 3: Allocate reliability need using energy and capacity-based analysis applied at the LSE level

This is the same as the need determination approach described in section 6.5 as *Need Determination – Reliability – Option 5: Conduct both energy and capacity-based reliability analyses using resource sufficiency assessments*, but applied to each LSE. The same benefits and disadvantages discussed in section 6.5 apply here.

Need Allocation – Specific – Option 4: Allocate GHG reduction need using LSE-specific annual limits

Need Determination – GHG Reduction – Option 1: Use LSE-specific annual GHG limits to assess compliance, the GHG reduction need determination approach described in section 6, by design involves LSE-by-LSE assessment of expected GHG emissions relative to their targets. Therefore, that GHG reduction need determination option points directly to allocation of the need at the LSE level.

7.1.3. Recommendations

Phase 1: For use through the end of 2021

In the event of a procurement order in the remainder of this IRP cycle, staff recommends that the CPUC implement:

Need Allocation – Specific – Option 1: Allocate system reliability need using the load-share method utilized in D.19-11-016: As discussed in section 6.6 staff expects the relevant need determinations in this IRP cycle to be associated with mid-term system reliability, and therefore recommend need allocation similar to that used in D.19-11-016. This is already familiar to LSEs and other stakeholders, applicable to a reliability need, and therefore can be implemented in the short time available.

Staff expects that this approach (and likely any approach where need allocation to LSEs follows need determination) will require carefully defining what the procurement baseline is so that LSEs can demonstrate that their procurement is incremental and compliant.

Need Allocation – General – Option 1: Need allocation to LSEs follows need and **Need Allocation – General – Option 3: Pro-rate the need based only on LSEs' load :** These options involve only allocating procurement requirements to individual LSEs if there is an overall need, and pro-rate the need to LSEs on the basis of load share. These options are implied by using *Need Allocation – Specific – Option 1: Allocate system reliability need using the*

load-share method utilized in D.19-11-016. While staff sees merit in exploring alternatives that enable crediting LSEs that are doing more than their share of procurement than others, the complexity involved will take significant time to work through. In the interim, staff notes that the CAM and PCIA already serve to share the costs of existing resources across LSEs broadly in proportion to load share. These mechanisms, plus ensuring that individual LSEs are credited for procurement in excess of their D.19-11-016 requirements, when allocated need for new procurement, will likely deliver reasonably equitable outcomes.

Staff notes one relatively straightforward improvement that may be possible during Phase 1: adding a mechanism to *Need Allocation – Specific – Option 1: Allocate system reliability need using the load-share method utilized in D.19-11-016* to update the allocation to each LSE on an annual basis as load forecasts change. This helps manage potential issues arising from ordering procurement in 2021, using forecast 2021 (or 2022 if available) resource adequacy capacity to address a need likely starting in 2024. The 2 to 3-year interval is longer than the equivalent for D.19-11-016 and may allow for a significant shift in load between LSEs. If the need allocation can be updated annually, this may reduce the risk of inequity, by allowing LSEs to adjust their procurement to their share of load. Load changes would introduce an element of uncertainty however LSEs should be able to trade up and down their positions with other LSEs given the overall procurement requirement would remain constant.

Phase 2: For use in future IRP cycles

For CPUC-directed procurement next IRP cycle and beyond, staff recommends that the CPUC implement:

Need Allocation – General – Option 2: Pro-rate the need based on LSEs' portfolio positions as well as their load : Additional time should allow the CPUC and stakeholders to explore ways to address the limitations of Phase 1 approaches, including directly considering each LSEs' portfolio position, not just their share of load.

Staff suggest exploring at least two specific ways to implement such an approach:

- **Need Allocation – Specific – Option 3: Allocate reliability need using energy and capacity-based analysis applied at the LSE level:** This method, proposed by stakeholders in Track 3 of the RA proceeding, needs further development and stakeholder vetting to validate why it should be used in place of, or complementary to, the current paradigm for assessing reliability in both the RA program and the IRP process. However, it may be a relatively straightforward method to measure the ability of each LSE's portfolio of contracted resources to meet future reliability needs as the penetration of variable and use-limited resources increases.

- Individual LSE load and resource tables, applying resource-specific ELCCs developed as part of the LOLE analysis used to determine the procurement need (refer *Need Determination – Reliability – Option 4: Conduct using an LOLE analysis* in the previous section).

If some of the procurement need is resource-specific (e.g., a long lead-time resource) the chosen method would be applied to the generic and specific resource capacities separately.

Need Allocation – Specific – Option 4: Allocate GHG reduction need using LSE-specific annual limits: For allocation of GHG reduction need, staff recommends using LSE-specific annual GHG limits, consistent with the recommendation for need determination in section 6.6.

7.2. Procurement and Operating Entity Direction

7.2.1. Background

When the CPUC acts to ensure procurement, it must provide direction about what entities will procure and operate the resources. This direction could range from being a firm requirement the applicable entities must follow, to choices that they have. Direction regarding procurement entity may differ from that related to the operating arrangements for the resources, but they are likely to be related. The entity procuring a resource will enter into some form of offtake contract with the resource owner, or may own the resource directly; whereas the entity operating a resource schedules its output, manages its maintenance schedule, and controls other activities critical for its performance post-construction. It is possible that procuring and operating roles are undertaken by the same entity. CPUC direction should at least identify which entities are undertaking procurement and operations, though it may be more prescriptive about how these activities should be performed.

Staff believes that LSEs self-providing to meet procurement needs is the default approach in IRP, yet there may be certain circumstances under which self-provision is not appropriate. Knowing that there may be some individual or collective deficiency, the CPUC can determine that some portion of future need should be procured on behalf of all customers. While this may limit customers realizing the full benefits of retail choice theoretically available from a completely competitive retail market, it would be insurance for customers against having to endure the full costs of procurement failure. With this in mind, staff believes that the following factors should be considered for each tranche of procurement in IRP:

- Size of the resources likely to be required to meet the procurement need
- Complexity of the development process, and the associated level of risk, for the prospective resources
- Benefits and disadvantages of LSEs having autonomy to meet their customers' and other stakeholders' unique circumstances
- Capabilities and characteristics of the entities, particularly their credit worthiness
- Degree to which procurement success is reliant on a small number of entities, versus diversifying and spreading the effort across a larger group

- Time, costs, and risks involved in establishing new entities
- Complexity of cost allocation, which arises when the procurement entity/ies are not the same as those who have been allocated the need
- Incentives for different LSEs or LSE-types to be allocated need, or to avoid being allocated need

Further, staff identifies that this Procurement Framework should explore whether LSEs should be given the opportunity to "opt out" of self-providing some or all of the resource need.

When considering the appropriate ownership and operating arrangements for resources procured in IRP, staff suggests that the following factors should be considered:

- Size of resources being procured
- Potential conflicts of interest between the entity/ies with operational control over a resource, and the LSEs whose procurement needs are being met by the resource. For example, how a resource is scheduled into the CAISO day ahead or real-time market may impact competing generators or storage that LSEs have financial interest in via their various offtake agreements.
- Capabilities and characteristics of the entities

The recent Local RA Central Procurement decision, D.20-06-002, [36] provides a relevant point of comparison to options staff describes in this section. It requires two of the IOUs to act as "front-stop"[37] CPEs for the procurement of Local RA in their services territories. The rationale stated in the decision is that the use of CPEs increases the scale of buyers, which should reduce the cost for rate payers from that of LSEs procuring individually. Staff sees the other main argument for using CPEs in procurement, in general, is that they can increase the likelihood of the full procurement need being met. This assumes that they are more capable than individual LSEs acting alone or collectively, and that the risks of over-reliance on just a few entities to perform are relatively low.

D.19-11-016 allows all LSEs to self-provide, with non-IOUs able to opt-out. In addition to self-providing, the IOUs are CPEs for the opt-out LSEs as well as for backstop procurement, if needed. Staff understands that this approach was taken to provide autonomy to LSEs to procure resource types that align most with their objectives, whether they be a low GHG portfolio, minimizing costs to their portfolios, or other. The decision allows utility-owned generation up to a certain portion of the procurement requirement, but otherwise places no restriction on the type of entity that can own or operate the procured

[36] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K671/340671902.PDF

[37] "Front-stop" procurement is when a CPE is ordered to procure without individual LSEs being given the opportunity to self-provide. This is distinct from "backstop" procurement, which is when a CPE must fill the procurement needs that remains due to LSEs opting-out of self-provision or failing to procure successfully.

resources. Future procurement in IRP may need to take different approaches to D.19-11-016, depending on the nature of the need determination and allocation.

7.2.2. Options for Procurement and Operating Entity Direction

Staff puts forward options for each of the main issues, anchored around the assumption that LSEs should self-provide to meet all procurement need determined except large, long lead-time resources, as follows.

Degree of LSEs' Opportunity to Procure Large, Long Lead-time Resources before a CPE does so

Procurement Entity – Large Resources – Option 1: CPE/s conduct front-stop procurement when the need determination identifies large, long lead-time resources can provide mutual benefit to all LSEs

This would involve the CPUC ordering one or more CPEs to conduct procurement of large, long lead-time resources in the exceptional circumstances where the need determination identifies that it would be sub-optimal for LSEs to attempt to procure these resources individually or collectively. LSEs would not be given an opportunity to procure these; rather the CPE/s would be appointed as front-stop procurement entities.

Under this option, all LSEs would be required to pay for "mutual benefit procurement," and then each LSE would receive a portion of the RA benefit and a portion of the procurement costs. The benefits and costs would be provided over time as the resource operates, and the mutual benefit procurement would be authorized several years in advance.

Benefits:

- Potentially increases reliability and resource portfolio security and diversity
- In theory, aligns the procurement need with the capabilities of the procurement entities, in terms of their size, creditworthiness, and other attributes
- Front-stop procurement can minimize the rushed, more expensive procurement that might be required if a CPE is only appointed to procure after LSEs have attempted and failed to meet the need

Disadvantages:

- Reduces the autonomy of LSEs and increases the level of regulatory intervention, including the need to allocate costs
- Requires criteria to be developed to identify when the procurement need should be met by CPEs[38]
- Front-stop procurement may result in redundant resources if the CPUC's order comes part-way through LSEs' efforts to meet the need themselves

[38] For example, Tierney proposes "Centrally Procured RA products," defined as "RA products that cannot be practically or efficiently procured through a decentralized approach and/or fairly allocated to all benefitting customers and which would need to be satisfied through a centralized procurement process;" *Resource Adequacy and Wholesale Market Structure for a Future Low-Carbon Power System in California, 2018* https://www.analysisgroup.com/globalassets/content/insights/publishing/tierney_california_resource_adequacy_and_wholesale_market_design.pdf

Consider whether a front-stop mechanism works better for certain resource types as compared to others. For example:

- Redundancy in procurement of pumped hydro resources at two separate locations may be suboptimal
- Long duration storage procured as battery storage (stacked) may pose a smaller risk because it inherently includes flexibility

Consider whether a front-stop mechanism works better based on certain needs or attributes.

- Minimize potential redundancy in resource procurement to meet annual GHG target because the ultimate goal can still be met
- Accept a small amount of redundant procurement of a resource that contributes to reliability, especially if the CPUC is simultaneously ordering thermal retirement

Procurement Entity – Large Resources – Option 2: LSEs given opportunity to conduct procurement of large, long lead-time resources

LSEs would individually or collectively attempt to procure the large, long lead-time resources needed. If the LSEs fail to procure, then one or more CPEs would conduct backstop procurement.

The benefits and disadvantages of this are the opposite of the option above.

Extent of LSEs' Flexibility to Opt-out of Self-providing

Procurement Entity – Self-provision – Option 1: Non-IOUs can opt-out of self-providing some or all new resource development

As for D.19-11-016, CCAs and ESPs allocated a procurement need would be able to opt-out, leaving one or more CPEs to procure on their behalf. IOUs are not given this option because they are assumed to be the default suppliers in their respective service territory. This is consistent with the IOUs' traditional role as "provider of last resort", a matter which is likely to be examined by the CPUC and stakeholders in 2021.

Benefits:

- In theory, this would tend to shift procurement from smaller and/or less resourced LSEs to those entities more capable of conducting it successfully
- Enables increased buying power, which should result in more optimal outcomes for ratepayers

Disadvantages:

- Requires increased regulatory intervention, including the need to allocate costs
- Allows some LSEs to operate without full procurement capabilities, which may create uncertainty about the role of LSEs and may not serve ratepayer interests in the long run
- Presumes IOUs should retain procurement capabilities regardless of whether they are allocated procurement need

- May require LSEs to decide whether to self-provide prior to all steps of the procurement process being defined, which may result in inequity between customers

Procurement Entity – Self-provision – Option 2: All LSEs allocated procurement need must self-provide

CCAs and ESPs that are allocated a procurement need would be required to self-provide.

The benefits and disadvantages of this are the opposite of the option above.

Types of Entities to be Appointed as CPEs

Procurement Entity – Type – Option 1: IOUs are the CPEs

Each IOU would be the CPE in its respective service territory, performing procurement on behalf of other LSEs in the event of them opting-out, if applicable, or failing to successfully self-provide. Further, one or more of the IOUs could be appointed by the CPUC to conduct front-stop procurement in the exceptional circumstances of the need determination finding the need for resource types that it would be sub-optimal for LSEs to procure individually or in a self-organized, collective fashion.

Benefits:

- IOUs have existing procurement capabilities

Disadvantages:

- Possible conflicts of interest arising from IOUs procuring on behalf of their competitors
- Reliance on IOUs, which each have their own risk factors

Procurement Entity – Type – Option 2: Appoint a non-LSE CPE

These options involve broadening the range of potential CPEs to an existing or new state or private sector organization to conduct procurement. Possible entities include:

- State procurement (e.g., Department of Water Resources)
- California Power Authority[39]
- Joint Powers Authority, a non-profit collective buyers' utility (e.g., Southern California Public Power Authority, Northern California Power Agency), or an investor-owned utility that serves all LSEs
- Government led-cooperative (e.g., similar to Tennessee Valley Authority, or Western Area Power Administration)

Benefits:

- By not being an LSE, such an entity should be well-positioned to act without advancing the interests of some LSEs over others

Disadvantages:

[39] Established via Senate Bill 6 (2001-2002)
http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=200120021SB6

- Time, cost, and risk to establish a new entity or prepare an existing entity for a complex role in procurement

Procurement Entity – Type – Option 3: All LSEs can apply to be a CPE

To accommodate the market fragmentation that has occurred in recent years, the CPUC could allow different procurement entities to apply to provide this mutual benefit procurement. An individual IOU, CCA, ESP or another entity could take on the leadership role in procurement (i.e., contract for the new resource). The CPUC could grant that entity conditional approval for cost recovery for a tranche of mutual benefit procurement and then a cost surcharge would be passed on to all customer bills, and RA credit allocated to LSEs for RA showings, based on load share (similar to today's Cost Allocation Mechanism - CAM - discussed in section 7.3 below).

Only procurement determined to be needed based on the Procurement Framework would be eligible for the CPUC to designate it as "mutual benefit procurement." One or more entities can enter into contracts with new resource types that could fill the need and if brought online could provide benefits broadly to the entire system. A main difference between CAM and mutual benefit procurement would be that LSEs (including IOUs, CCAs, or other utility-like entities such as a Joint Powers Authority or local or state agency) could apply to the CPUC to have specific resource contracts qualify for mutual benefit cost-recovery (i.e. from all customers). The contracting counterparty and/or ownership of the resource could evolve over time, but the CPUC would establish the resource's designation period, during which it is ensured that the resource is eligible for cost recovery.

Benefits:

- Gives potentially all LSEs the opportunity to conduct procurement on behalf of others if needed, reducing reliance on IOUs and/or other CPE alternatives

Disadvantages:

- Time, cost, and risk to establish a new entity or prepare an existing entity for a complex role in procurement

Procurement Entity – Type – Option 4: Develop criteria to determine appropriate procurement entity

Develop criteria for delineating between LSE-attainable resources, likely related to the "routine" vs. "non-routine" distinction described in section 3.2 above, and those which will require CPUC direction or the support of a CPE. Allow any entity to apply to the CPUC for a permit to be designated a CPE and to have a specified resource contract be eligible for CAM-like cost recovery treatment.

Requirements to be a Procurement Entity

Procurement Entity – Requirements – Option 1: No requirements for LSEs to be appointed as procurement entities

As for D.19-11-016 all CPUC-jurisdictional LSEs are eligible to self-provide, regardless of their size, creditworthiness, and other indicators of their procurement capability.

Benefits:

- Lessens upfront regulatory intervention in procurement, though it may later be required in the event of procurement failure
- Avoids introducing a new barrier to entry to becoming an LSE, which may serve to provide more customer choice
- Avoids the need to establish criteria

Disadvantages:

- May increase the risk of procurement failure and therefore increase price risk to customers
- Higher risk of procurement failure would reduce certainty about medium- to long-term reliability and GHG reduction.

Procurement Entity – Requirements – Option 2: LSEs must demonstrate they meet minimum standards to be a procurement entity

The CPUC would establish minimum standards, such as LSEs needing to have investment grade credit ratings, before requiring or allowing LSEs to fulfil a CPUC-directed procurement order themselves.

The benefits and disadvantages of this are the opposite of the option above.

Requirements Sssociated with the Operating Arrangements for Centrally-procured Resources

Procurement Entity – Operations – Option 1: CPE controls operating arrangements

This would allow a CPE (for example, an IOU or other entity designated by the CPUC procuring on behalf of LSEs, whether front-stop or backstop) to negotiate offtake arrangements with the resource developer without having to explicitly ensure that the LSEs' individual interests are taken into account. Staff expects this to be mainly relevant to the scheduling strategy for the resource in the CAISO day-ahead and real-time markets.

Benefits:

- Simplifies the CPE's negotiation with the resource developer by not needing to factor other interests into the operating arrangements
- Lessens the need for regulatory intervention

Disadvantages:

- Potential conflict of interest between the procurement entity and the LSEs whose needs are being served by the resource

Procurement Entity – Operations – Option 2: CPE must ensure the LSEs it is procuring on behalf of have rights in operational arrangements

Entails the opposite benefits and disadvantages of the option above.

7.2.3. Recommendations

Staff believes that current legislative and regulatory arrangements, as well as market conditions, not just enable but require CCAs and ESPs to self-provide to meet most procurement needs. Staff sees that a key challenge for this Procurement Framework is developing criteria for determining when there should be exceptions to this approach.

Phase 1: For use through end of 2021

In the event of a procurement order in the remainder of this IRP cycle, staff recommends that the CPUC implement:

Procurement Entity – Large Resources – Option 1: CPE/s conduct front-stop procurement when the need determination identifies large, long lead-time resources can provide mutual benefit to all LSEs: In the event of need determination conducted in the remainder of this IRP cycle identifying large, long lead-time resources, staff recommends that CPEs conduct front-stop procurement rather than *Procurement Entity – Large Resources – Option 2: LSEs given opportunity to conduct procurement of large, long lead-time resources* (which would only revert to one or more CPEs if the LSEs failed to make sufficient progress). An exception to this if LSEs already have procurement (likely joint) significantly in progress at the time of the need determination. Staff's rationale is that large, long lead time resources are expected to be ordered during Phase 1 only if they are found as requiring urgent action. The investment certainty inherent to this would provide strong benefits for resource development, as well as LSEs' planning and procurement efforts for all the other resource types and attributes needed to meet IRP objectives. These benefits would likely outweigh the disadvantages of reduced autonomy for LSEs.

Procurement Entity – Self-provision – Option 1: Non-IOUs can opt-out of self-providing some or all new resource development: In the event of any CPUC-directed procurement this IRP cycle, staff recommends that non-IOUs be given the flexibility to opt-out, like they were for D.19-11-016, in which case a CPE procures on their behalf. Staff sees this as inconsistent with the role CCAs and ESPs should be playing in the long term, however it is familiar to stakeholders and provides for expediency until the implications of the alternative, *Procurement Entity – Self-provision – Option 2: All LSEs allocated procurement need must self-provide*, are understood. The CPUC and stakeholders should examine the benefits and disadvantages of requiring even the very small LSEs to self-provide, in preparation for the next IRP cycle.

Procurement Entity – Requirements – Option 1: No requirements for LSEs to be appointed as procurement entities: Consistent with the above, staff recommends that no new minimum requirements be placed on LSEs before they are eligible to self-provide to meet CPUC-directed procurement. Such requirements would likely be hurdles to the eventual intent of all LSEs being required to self-provide. Staff notes the disadvantage of

this option, that it may lead to more procurement failure than would otherwise be the case, is mitigated if *Procurement Entity – Large Resources – Option 1: CPE/s conduct front-stop procurement when the need determination identifies large, long lead-time resources can provide mutual benefit to all LSEs* is adopted, so that large, long-lead time resource procurement is not at-risk of such failure.

Procurement Entity – Type – Option 1: IOUs are the CPEs: If procurement by CPEs is necessary this IRP cycle, for example due to some LSEs opting out of self-provision, staff recommends that it is performed by the IOUs. Again, staff sees this as the most expedient and practical approach for now. The alternative, of appointing or establishing a non-IOU CPE (*Procurement Entity – Type – Option 2*), such as those listed above, will likely take longer than the time available this IRP cycle but should be explored in preparation for Phase 2.

Procurement Entity – Operations – Option 2: CPE must ensure the LSEs it is procuring on behalf of have rights in operational arrangements: To the extent any procurement by CPEs is conducted in response to CPUC-directed procurement this IRP cycle, staff recommends that the CPEs must provide for the affected LSEs' interests to be represented in the operating arrangements of the resource. This is clearly more equitable than the alternative (*Procurement Entity – Operations – Option 1*) and staff expects it is achievable despite the short timeframe. This will likely require consultation between IOUs and non-IOUs in the short term, in order to prepare for procurement of large, long lead-time resources, in case needed.

Phase 2: For use in future IRP cycles

For CPUC-directed procurement next IRP cycle and beyond, staff recommends that the CPUC implement:

Procurement Entity – Large Resources – Option 1: CPE/s conduct front-stop procurement when the need determination identifies large, long lead-time resources can provide mutual benefit to all LSEs: For similar reasons to Phase 1, in the exceptional circumstances of need determination identifying large, long lead-time resources, staff recommends that CPEs conduct front-stop procurement rather than first allowing LSEs to self-provide. Further, for Phase 2, this approach can be strengthened by broadening the range of available CPEs to beyond just the IOUs. Refer recommendations for *Procurement Entity – Type – Option 2: Appoint a non-LSE CPE* and *Procurement Entity – Type – Option 3: All LSEs can apply to be a CPE* described below.

Procurement Entity – Self-provision – Option 2: All LSEs allocated procurement need must self-provide: All LSEs allocated procurement need should be required to self-provide. Staff sees this as consistent with the intent of current legislation, as well as market conditions which indicate that customer choices and load migration from IOUs are not short-term anomalies. It has the benefit of reducing the need for regulatory intervention, including creating or modifying mechanisms to allocate costs incurred by CPEs to the benefiting LSEs or their customers. The disadvantages of requiring even very small LSEs to self-provide should be examined, however staff expects that collective procurement, and bilateral transactions with LSEs that are more active in procurement, have been and will continue to be, viable activities for small LSEs to participate in.

Procurement Entity – Requirements – Option 2: LSEs must demonstrate they meet minimum standards to be a procurement entity: If LSEs can be required to meet minimum standards before being directed to self-provide in a way that improves their capabilities, rather than creating an unnecessary regulatory burden that ultimately limits customer choice, then clearly this should be pursued in Phase 2. It is not clear to staff if this should be achieved via the CPUC setting requirements, or via broader legislative changes, essentially associated with clarifying what it means to have a "license" to serve load in California.

Procurement Entity – Type – Option 2: Appoint a non-LSE CPE and **Procurement Entity – Type – Option 3: All LSEs can apply to be a CPE:** Staff is aware that a variety of LSEs are capable of procuring new resources and believes it is entirely feasible that a variety of entities could become centralized procurement entities for mutual benefit procurement. Accordingly, staff recommends that both of these options be explored by the CPUC and stakeholders in the short term, so they can be implemented in Phase 2 if needed.

Procurement Entity – Operations – Option 2: CPE must ensure the LSEs it is procuring on behalf of have rights in operational arrangements: CPEs must provide for the affected LSEs' interests to be represented in the operating arrangements of the resource, for the same reasons as described for Phase 1 above.

7.3. Cost Allocation

7.3.1. Background

Cost allocation is required when an entity procures a resource to serve customers that it is not responsible for serving. This step of procurement is closely related to the need allocation and identification of procurement entity steps discussed above. This step involves assessing the appropriate allocation structure necessary to address the conditions of the procurement. Key considerations include:

- Identifying the circumstances which require costs to be allocated, for example when an LSE opts-out of self-providing, or when a non-IOU fails to procure, requiring backstop procurement
- How to calculate costs of procurement, including netting of the benefits
- Billing implications, and the associated effect on the competitiveness of LSEs' pricing to customers

Various approaches have been used to allocate costs of the procurement that has taken place since the early 2000s:

Cost Allocation Mechanism: The LTPP proceeding adopted the CAM[40] process to designate the IOUs as the procurement entities for new generation resources and allow the costs and benefits of new generation to be shared by all benefiting customers in each IOU's service territory. The approach was adopted to support the development of new generation to ensure reliability.

The LSEs in the IOUs' service territories are allocated the capacity benefits, which go towards meeting the LSEs' RA requirements. The benefiting customers pay only for the net costs of this capacity, determined as the total cost of the contract less the energy revenues associated with dispatching the contract.

In addition to procurement for reliability, CAM has been applied, with amendments, to procurement orders for CHP,[41] energy storage,[42] local reliability,[43] and demand response.

As of August 2019, approximately 8 gigawatts (GW) of resources were subject to CAM or variations on CAM.

Modified CAM: D.19-11-016 requires a cost allocation method to be developed that addresses the opportunity for CCAs and ESPs to self-provide. In this way, it will be a "modified CAM" because the CAM is designed with the IOUs as the only procurement entities. It must allow for cost allocation, not just related to non-IOUs opting-out of self-provision, but for the potential backstop procurement required if self-providing non-IOUs fail to procure.

Issues associated with the use of CAM include:[44]

- Lack of incentive for CCAs and ESPs to undertake their own reliability procurement

- Lack of reciprocity: the CAM allows costs to be allocated in one direction only. CCAs and ESPs do not have any mechanism to procure on behalf of all electric grid customers. Similarly, the CPUC does not have oversight of CCAs' and ESPs' procurement (e.g., bid evaluation methodology).

- Challenges with determining whether a CCA or ESP already has sufficient resources, and does not need any to be procured on its behalf

[40] D.06-07-029 available at: https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/58268.PDF
[41] D.10-12-035 available at: https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/128624.PDF
[42] D.13-10-040 available at: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M079/K533/79533378.PDF
[43] D.18-06-030 available at: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M216/K634/216634123.PDF
[44] https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/About_Us/Organization/Divisions/Policy_and_Planning/PPD_Work/PPDCAMwhitepaper20140924forpub.pdf

7.3.2. Options for Cost Allocation

Cost Allocation – Option 1: Use CAM when a CPE is directed to procure

This would be applicable in the exceptional circumstances discussed in section 7.2.

Cost Allocation – Option 2: Use Modified CAM, once developed as required by D.19-11-016, when procurement need is allocated to various procuring entities including non-IOU LSEs

Staff notes that this is the subject of the live stakeholder process associated with the Administrative Law Judge's Ruling Seeking Comments on Backstop Procurement and Cost Allocation Mechanisms dated June 5, 2020.

Cost Allocation – Action 1: Evaluate whether additional cost allocation mechanisms are required

This should consider cost allocation challenges associated with procurement need and allocation involving new approaches discussed in sections 6, 7.1 and 7.2, including:

- *Need Determination – Reliability – Option 5: Conduct both energy and capacity-based reliability analyses using resource sufficiency assessments*
- *Need Determination – GHG Reduction – Option 1: Use LSE-specific annual GHG limits to assess compliance*
- Mutual benefit procurement by non-IOUs (combination of *Procurement Entity – Large Resources – Option 1: CPE/s conduct front-stop procurement when the need determination identifies large, long lead-time resources can provide mutual benefit to all LSEs* and *Procurement Entity – Type – Option 3: All LSEs can apply to be a CPE*)

7.3.3. Recommendation

Phase 1: For use through end of 2021

In the event of a procurement order in the remainder of this IRP cycle, staff recommends that the CPUC implement:

Cost Allocation – Option 2: Use Modified CAM, once developed as required by D.19-11-016, when procurement need is allocated to various procuring entities including non-IOU LSEs: This aligns with the recommendations for need allocation and procurement entity direction discussed in the sections above. This option allows for need to be allocated to all LSEs potentially, and then for flexibility regarding whether all or some LSEs self-provide.

This Procurement Framework should be adapted to accommodate the outcomes of the Administrative Law Judge's Ruling Seeking Comments on Backstop Procurement and Cost Allocation Mechanisms dated June 5, 2020.

Cost Allocation – Option 1: Use CAM when a CPE is directed to procure: To allow for the exceptional circumstance of large, long lead-time resources determined to be needed, and for the CPUC to direct a CPE to conduct front-stop procurement as discussed in section 7.2, staff recommend the CAM will be required. The CPUC has relied for over ten years on the CAM to provide reliability as well as risk-reduction for all customers, including those of ESPs. Non-IOU LSEs have often opposed paying for CAM resources, and it has often been noted that CAM resources constitute a large portion of the resource portfolio (thus reducing the percentage of the generation bill that can be subject to price differentiation between LSEs). However, staff believes that the CAM treatment for resources has been a successful framework for new resource procurement in the era of retail choice.

Phase 2: For use in future IRP cycles

Staff recommends a continuation of Phase 1 approaches, and that the CPUC prepares for a wide range of future procurement need determination and allocation possibilities. Decisions about other steps in the procurement process, particularly whether LSEs can opt-out of self-providing and whether backstop procurement is used (refer sections 7.2 and 9 respectively) will affect the extent of costs needing to be allocated.

Accordingly, staff see **Cost Allocation – Action 1: Evaluate whether additional cost allocation mechanisms are required** as important for the CPUC and stakeholders to conduct regardless of the Procurement Framework the CPUC ultimately adopts.

8. Procurement Approval

8.1. Background

In its most general sense, procurement approval is the process procurement entities go through to gain permission from the highest relevant decision-making authority to proceed with procuring a resource and thereby committing to significant obligations.

In the context of IRP, staff focus here on the process for IOUs and potential central procurement entities, as discussed in Section 7.2 above, to gain approval for cost recovery from ratepayers. CCAs have their own arrangements to recover costs from their customers, and ESPs achieve this via direct negotiation with their customers. In this way IRP procurement approval discussed here is distinct from the compliance monitoring and enforcement process, which applies to all LSEs required to participate in the IRP process and is addressed in section 9 below. Section 9 includes discussion about whether the CPUC should review and approve proposed procurement for alignment with the procurement need prior to LSEs executing contracts.

The CPUC's existing requirement is that for contracts longer than 5 years, IOUs must make separate applications[45] prior to recovering costs, whereas for shorter contracts IOUs do not usually need pre-approval, provided they procure according to the upfront standards adopted by the CPUC. Exceptions to this include the approval process for IOUs' RPS contracts, and special circumstances such as contracting with OTC units.[46] For the contracts with tenures of 5 years or shorter, IOUs submit them as part of their bundled procurement plan quarterly compliance reports.

The main issue with determining an appropriate approval process is balancing expediency of procurement with the need for stakeholder review and the possibility of that review finding significant deficiencies. A related trade-off is between having standardized CPUC approval criteria, such as solicitation process requirements relating to bid evaluation, defined upfront versus ensuring these are fit for each instance of procurement.

D.19-11-016 requires IOUs to file Tier 3 Advice Letters, rather than separate applications, to request CPUC approval for cost recovery of their contracts. Non-IOUs' procurement is approved by their respective decision-making authorities. All LSEs, however, are required to report on their procurement progress, so that the CPUC can monitor and enforce compliance with D.19-11-016. This is discussed further in Section 9 below.

D.19-11-016 requires the Tier 3 Advice Letters to include the metrics used to compare all bids, the justification for any proposals for utility-owned assets, and other demonstrations of compliance with that decision.

[45] Applications pursuant to Rule 2 of the Rules of Practice and Procedure available at: http://docs.cpuc.ca.gov/SearchRes.aspx?docformat=ALL&DocID=209618807

[46] D.14-02-020 available at: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M088/K639/88639082.PDF

This Staff Proposal seeks to explore the appropriate approval process for future procurement in IRP, particularly in relation to the need to balance procurement expediency with opportunity for stakeholder review.

8.2. Options for Procurement Approval

Procurement Approval – Option 1: Rely on the CPUC's existing requirements, including applications

Benefits:

- Provides sufficient opportunity for stakeholder review
- Proven process, familiar to IOUs, CPUC, and stakeholders

Disadvantages:

- Urgent procurement may not be able to be accommodated in time
- May need revision to adapt to the possibility of non-IOU procurement entities seeking to recover costs from IOU ratepayers

Procurement Approval – Option 2: Allow approvals via Tier 3 Advice Letters, as per D.19-11-016, for urgent procurement

Benefits:

- Potentially faster process, if there is very little controversy, than the CPUC's traditional requirements

Disadvantages:

- Less opportunity for stakeholder review than the CPUC's traditional requirements
- May need revision to adapt to the possibility of non-IOU procurement entities seeking to recover costs from IOU ratepayers

Procurement Approval – Option 3: Develop a common resource valuation methodology (CRVM)

A CRVM would be used to strengthen the ability of IRP analysis to inform procurement across various resource-specific proceedings. Staff discussed the concept with stakeholders during the 2017-2018 IRP cycle. It would support the accurate and consistent measurement of value of electricity resources. Potential resource valuation components could include capacity value, energy value, resiliency or wildfire vulnerability mitigation value, as well as many other factors – some of which may already be in use in existing least-cost, best-fit or distributed energy resource cost-effectiveness methodologies. This would be complementary to other options and would allow LSEs more flexibility in their contract approval process if they used a CRVM adopted by the CPUC.

Benefits:

- Improve alignment between resources identified via IOUs' solicitation processes and the procurement need determined

Disadvantages:

- Time to develop such a methodology
- Risk of being overly complex or restrictive, by not keeping pace with technology or other changes

8.3. Recommendations

Phase 1: For use through end of 2021

In the event of a procurement order in the remainder of this IRP cycle, staff recommends that the CPUC implement:

Procurement Approval – Option 2: Allow approvals via Tier 3 Advice Letters, as per D.19-11-016, for urgent procurement: Tier 3 Advice Letters should be used to approve procurement resulting from a procurement order made during this IRP cycle to satisfy medium-term reliability needs. This expeditious approval process should allow for timely development of resources to satisfy medium-term reliability needs.

Procurement Approval – Option 1: Rely on the CPUC's existing requirements, including applications: If long lead-time or large-scale resources are determined to be needed to satisfy medium-term reliability needs, or long-term needs identified in 2021, staff recommends existing approval requirements be used, considering the large investments and unique challenges/risks these projects may face. This should include the use of applications. Whilst staff recommends the use of front-stop procurement by a CPE for the exceptional circumstances of a large, long lead-time resource need, as discussed in section 7.2 above, if the CPUC allows or supports LSEs to self-provide to meet this need, it should extend *Procurement Approval – Option 1: Rely on the CPUC's existing requirements, including applications* to apply to non-IOUs as well.

Phase 2: For use in future IRP cycles

For CPUC-directed procurement in the next IRP cycle and beyond, staff recommends that the CPUC implement:

Procurement Approval – Option 1: Rely on the CPUC's existing requirements, including applications: Existing approval requirements should be used due to the additional stakeholder review afforded, except where procurement is determined to be urgent.

Procurement Approval – Option 2: Allow approvals via Tier 3 Advice Letters, as per D.19-11-016, for urgent procurement: Tier 3 Advice Letters should only be used for exceptional, urgent procurement.

Procurement Approval – Option 3: Develop a common resource valuation methodology (CRVM): A Common Resource Valuation Methodology should be developed and implemented, to complement these approaches. Staff sees that a particular

potential benefit of this is the efficient consideration of DERs alongside supply side resources in the procurement track.

Staff notes that the way the approval step in the procurement process is defined in this section (see the Background section) is limited to how IOUs and potential CPEs gain cost recovery. For a broader interpretation, to include checks that proposed procurement by any LSE is aligned with the need, this section should be read in conjunction with section 9 below.

9. Compliance Monitoring & Enforcement

9.1. Background

When the CPUC acts to ensure procurement, as described in the sections above, the mechanisms for monitoring and enforcing compliance with its requirements must be clear to LSEs and other stakeholders. Staff believes that the main issues associated with this part of the procurement process are:

- Considering whether the procurement need, whether reliability, GHG reduction or other, is being met by a "standalone" procurement order, or programmatically
- Ensuring appropriate incentives and disincentives are in place for LSEs to complete the required procurement
- Designing the CPUC's role in this consistent with its authority
- Providing the CPUC access to information of sufficient detail and timeliness to effectively monitor compliance
- Determining when and how non-compliance will be assessed, and ensuring that corrective actions, if needed, can occur soon enough to enable the procurement requirement to still be met as far as possible
- Aligning with other parts of the procurement process, particularly need allocation and procurement and operating entity direction

The CPUC has the authority to monitor the progress of IOUs and non-IOU LSEs towards electric sector goals. On August 6, 2020, Resolution E-5080 approved an IRP Citation Program that established a process for assessing LSEs' compliance with IRP filing requirements, and applying penalties when appropriate.[47] However, the IRP process does not currently have any procurement-related penalty structure in place. Staff believes that the enforcement mechanisms of other CPUC programs, such as the RPS program and the RA program, cannot necessarily be relied on to ensure procurement of non-routine and urgent resource needs ordered through IRP.

D.19-11-016 addresses compliance monitoring and enforcement primarily via giving autonomy to non-IOU LSEs to self-provide, in addition to the IOUs, and assuming that the threat of backstop procurement is a sufficient disincentive to fail to do so. Further, the need determination and allocation of D.19-11-016 specifies resources that must be eligible to meet LSEs' future requirements under the System RA program, and that can potentially meet requirements under the RPS program, and thereby utilizes the existing compliance monitoring and enforcement components of these programs.

D.19-11-016 requires LSEs to provide the CPUC with annual updates on procurement progress, and as the backstop arrangements are developed, non-IOU self-providing LSEs are

[47] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M344/K806/344806352.PDF

likely to be required to make additional showings. These will be designed so that the CPUC can determine whether procurement is on track to be successful, or whether backstop procurement should be triggered.

As the guiding principles indicate, the Procurement Framework should not disincentivize LSEs from planning appropriately in their individual IRPs. LSEs should not wait until a procurement order is in place to procure new resources. Most resources, especially modular resources, which entail significantly smaller procurement challenges than large or long lead-time resources, should be procured by LSEs according to their IRPs or according to PSP direction, without any further guidance from the CPUC. The Procurement Framework would not be successfully meeting the guiding principles if LSEs are not procuring resources, and if procurement orders are regularly required for reliability or GHG reduction resource needs that have become urgent because of a lack of LSE action, and could have been avoided. It is important for IRP monitoring to track not only progress, but also to identify trends such as a lack of procurement in a timely manner.

Staff's recommendations in prior sections establish a scaffolding that would support the monitoring and enforcement steps. These include, but are not limited to:

- *Need Determination – General – Option 1: Conduct need determination regularly, based on a set schedule*
- *Need Determination – Action 1: Apply "viability factors" to planned* resources
- *Need Determination – Action 2: Establish standard estimates for length of procurement process based on resource* characteristics
- *Need Determination – Action 3: Ensure that the IRP filing requirement planning standards reflect the need determination* standards
- *Need Determination – GHG Reduction – Option 1: Use LSE-specific annual GHG limits to assess compliance*

Staff proposes the following options to build on these, and to ensure that IRP procurement monitoring and enforcement addresses the main issues outlined at the start of this background section.

9.2. Options for Compliance Monitoring & Enforcement

9.2.1. Compliance Monitoring Options

Compliance Monitoring – Option 1: Maintain current monitoring approach: annual progress reports and milestone demonstrations determined by each procurement order

This would apply the compliance monitoring structure of D.19-11-016, specifically:

1) Procurement progress reports submitted by self-providing LSEs annually

2) Milestone demonstrations laid out in individual procurement orders, utilizing D.19-11-016 as a template.

Benefits:

- Minimizes upfront time required to establish monitoring guidelines in each procurement order

Disadvantages:

- Past monitoring approach may not necessarily be fully applicable to the need determination and specific attributes of future procurement orders. Differences may result in the need for modifications to the past monitoring approach, which may lead to delays, without a standard in place for how to address them.

Compliance Monitoring – Option 2: Develop a standard method for establishing monitoring milestones and triggers for corrective action

Develop a standard method for establishing monitoring milestones to trigger corrective action if necessary. Milestones should be driven by information. Milestone standards can streamline the process and reduce procurement order delays as well as simplify tracking across multiple procurement orders.

The standard method for establishing monitoring milestones can address issues such as the following:

- The correct balance between LSEs having sufficient time to take procurement action, and the CPUC or a CPE, if applicable (refer to section 7.2), having adequate time to react if an LSE fails to meet a milestone.
- Whether LSEs should have an opportunity to address deficiencies before the application of a penalty. The range of possible penalties is discussed in the next subsection.
- To what degree LSEs' milestone demonstrations must include evidence that their procurement actions are meeting the specific needs and attributes of the CPUC-directed procurement. This could supplement or replace a similar check performed in the earlier procurement approval step applicable to IOUs, discussed in section 8.
    - For example: If an LSE-specific annual GHG limit is used to identify a GHG reduction need and allocate it to a specific LSE in terms of an amount (MW) of zero-emitting resources, could the milestone be met with a MW amount demonstration, or does the CPUC need to use available tools to track LSE-specific emission estimates?
- How LSEs should report if they meet their allocated procurement need through a resource different than one previously expected.
    - For example: an LSE receives CPUC approval for a supply-side resource, but then shows that it has instead met the need through demand-side resources and has terminated the procurement process for the supply-side resource.

Below staff includes an example of milestones that is intended for illustrative purposes only. In order for milestones to ensure efficient and effective procurement they may need to be tailored to specific resource types or grouped based on the expected time horizon for procurement. For example, milestones for a long lead-time resource would be many years in advance of the required online date, whereas short lead-time resources with fast development time may require milestones only 2-3 years prior to the required online date.

Illustrative Example: Compliance Monitoring Milestones

Milestone 1: Demonstration of collaboration across LSEs to procure in the form of a Request for Offers (RFO) or Request for Information (RFI)

- Options for this demonstration may include:
  - LSEs conduct a RFI individually or jointly
  - LSEs conduct a RFO individually
  - LSEs conduct a RFO jointly and report a resource allocation plan, by LSE.
- Trigger: One year prior to CPUC-defined Latest Possible Start Date for timely RFO or RFI

Milestone 2: Two years prior to CPUC-defined Latest Possible Start Date for project development

- Trigger: Contracting for less than 50% of the designated need

Another potential source of information for determining the appropriate timing for triggering corrective action could be regularly conducted RFIs by a designated CPE, if applicable to the particular procurement order. This could be reserved for when the CPUC identifies a resource need that may be particularly challenging to procure or includes a unique set of risks, such as long lead-time resources.

The CPUC could require the CPE to conduct a Request for Information (RFI) to collect information necessary to determining what the appropriate timing is for triggering corrective action.

Two opportunities for conducting an RFI:

1. Prior to ordering procurement: The RFI information could inform the details of the procurement order. Depending on the authority the CPUC holds, this may require a formal RFI order prior to the procurement order.
2. Closely following the procurement order: The procurement order itself could point to the need for a CPE to conduct an RFI.

The CPUC would use this information to:

- Step 1: Determine what level of procurement demonstration is required by when and establish procurement progress milestones that procurement entities must meet.

- Step 2: Ensure that if individual procuring entities fail to procure their allocated amount in a timely manner, the CPE can step in with sufficient time to procure the remaining amount.

Illustrative Example: RFI-driven Milestone Refinement

The CPUC identifies a need for a long-lead time resource, specifically offshore wind requiring new transmission development to be online by 2030. Per the established "Standard Estimates for Length of Procurement Process" (see section 6) an RFO should be held 8 years in advance of the identified online date for the need. The default RFO Demonstration Milestone would be set to 2022.

Step 1: The CPE conducts an RFI and finds that two potential transmission projects are well advanced in the permitting process, have obtained permits for a significant portion of the required right of way and can both be online within 5 years. The CPUC establishes a RFO Demonstration Milestone in 2024, with a 1 year buffer, instead of in 2022.

Step 2: Based on the RFI indication that a number of viable options could complete development within 5 years, a CPE can step in in a timely manner. If by 2024 individual LSEs do not demonstrate signed contracts for the long-lead time resource then the CPE can conduct an RFO, sign a contract, and ensure the resource is online by 2030.

Benefits:

- Utilizes information acquisition to improve effective and efficient procurement
- May reduce time required in the future to determine appropriate monitoring approach for each individual procurement order
- May improve efficiency of monitoring procurement progress across multiple procurement orders

Disadvantages:

- May require milestones to be tailored to specific resource types, increasing complexity and limiting procurement flexibility
- Upfront time and resources required for development

9.2.2. Enforcement Options

Enforcement – Option 1: Use the threat of "just-in-time" backstop procurement to incentivize self-providing LSEs to succeed

Implement the approach used for D.19-11-016, for future procurement.

If an LSE does not meet a monitoring milestone, backstop procurement by the applicable CPE will be triggered. Once the CPE steps in that is the procurement that the CPUC will rely on to meet the identified need. The LSE can continue to move forward with its original procurement process, however the LSE or its customers would still have to bear their share of the backstop procurement costs.

Benefits:

- Procurement need is likely to eventually be met, even if delayed due to the time taken to detect failure and trigger a CPE to commence backstop
- Already familiar to stakeholders

Disadvantages:

- Does not address risk of IOUs' non-compliance
- May not provide sufficient incentive for all LSEs to successfully self-provide. The ability of backstop procurement to incentivize the desired behavior, per the guiding principles, will depend largely on the degree to which it is "just-in-time" and more expensive than front-stop procurement.

Enforcement – Option 2: Develop an IRP procurement penalty structure

This would involve setting rules, perhaps drawing on applicable approaches already in place for the RA and RPS programs, to provide a disincentive for LSEs to be unsuccessful in meeting their need allocation, in terms of timeliness and volume of resource attributes.

Benefits:

- Levers that are tailored to IRP procurement may improve the CPUC's ability to effectively incentivize appropriate LSE behavior
- Directly addresses risk of IOUs' non-compliance

Disadvantages:

- An LSE's procurement failure would likely leave the procurement need unmet until the CPUC takes new procurement action
- Increases upfront work by requiring the development and formal approval of a penalty structure. The penalty structure must be established and shared publicly well in advance of its application so that LSEs have sufficient time to comply.
- Penalties may be passed through to ratepayers, which would undermine the intended incentive structure and the ability to achieve guiding principles such as ratepayer cost minimization, a state goal for the electric sector

- May be ineffective if LSE procurement is delayed due to reasons outside of their control

- It can be futile to penalize an LSE that may exit the market concurrently with recognition that they are unable to demonstrate compliance with the CPUC procurement order.

9.3. Recommendations

Phase 1: For use through end of 2021

In the event of a procurement order in the remainder of this IRP cycle, staff recommends that the CPUC implement:

Compliance Monitoring – Option 1: Maintain current monitoring approach: annual progress reports and milestone demonstrations determined by each procurement order: Staff recommends this option, rather than Compliance Monitoring Option 2, which would require the CPUC to develop a standard method for establishing monitoring milestones and procurement triggers. Staff's rationale is that although there are significant advantages to the latter, the development of a standard method, vetted by the public, and adopted by the CPUC could not feasibly be completed in time for such immediate procurement orders.

Enforcement – Option 1: Use the threat of "just-in-time" backstop procurement to incentivize self-providing LSEs to succeed: Staff recommends this option, rather than *Enforcement – Option 2: Develop an IRP procurement penalty structure*. Similar to the rationale provided above, although *Enforcement Option 1* has its limitations and disadvantages, establishment of a new penalty structure within this IRP cycle is not feasible. Staff acknowledges the potential ineffectiveness of this approach if the backstop procurement costs less than or equal to what it would cost the LSE to procure the resource themselves and accounting for the transaction costs.

Phase 2: For use in future IRP cycles

For CPUC-directed procurement next IRP cycle and beyond, staff recommends that the CPUC implement:

Compliance Monitoring – Option 2: Develop a standard method for establishing monitoring milestones and triggers for corrective action: Staff's rationale is that the upfront development time will result in many efficiencies in the future. A standard will simplify the development of monitoring direction within each procurement order. It can consider and clarify what approval should be required by the CPUC before LSEs other than IOUs enter contracts. Furthermore, this approach will improve monitoring across multiple procurement orders, leading to efficiencies for CPUC staff, as well as LSEs who must comply with the monitoring structures in place. Implementing this option for the next IRP cycle, will allow for the standard monitoring method to be informed by lessons learned from previous procurement orders. This approach would, however, require attention to address

how milestones can be established as to provide clear guidance, but not overly limit procurement flexibility.

Enforcement – Option 1: Use the threat of "just-in-time" backstop procurement to incentivize self-providing LSEs to succeed: Staff believes that a penalty structure may potentially be effective and appropriate, but it is too early to determine that. Additionally, a penalty structure alone, although providing an incentive to self-provide, does not ensure it, and leaves the risk of a resource gap to fill an important procurement need. For these reasons staff recommends the CPUC continues to allow for backstop to ensure that resources are in fact procured. However, staff also recommends that the CPUC explores the option for developing a penalty structure. This includes gaining a better understanding of the effectiveness of penalty fees to drive procurement given the range of barriers to procurement that LSEs may face.

Enforcement – Option 2: Develop an IRP procurement penalty structure: This would serve as an opportunity for the CPUC to understand the value of designing a structure that applies corrective action incentives tailored specifically to the nuances of IRP procurement. Staff acknowledges that the development of an appropriate penalty structure would have to take into consideration the guiding principles and ensure risks such as passthrough of penalty fees onto ratepayers, are minimized, while simultaneously ensuring the penalty is strong enough to adequately incentivize the desired action.

PU Code Section 380 provides the CPUC with the authority to enforce procurement to ensure reliability while advancing other state goals. The RA program cannot ensure the above if resources are not developed in time to be available to be contracted to meet the system, local, and flexible resource adequacy needs. Staff sees the IRP process as crucial to ensuring development of the resources required to meet the requirement established by PU Code 380.

10. Incorporation of Procurement Process Outcomes into Planning Process

10.1. Background

It is important for the Procurement Framework to encourage and maintain a strong link between planning and procurement, as noted in the guiding principles. This linkage can flow in both directions.

Planning → Procurement

Planning can be can lead to procurement through either the regular procurement activities of LSEs in response to the guidance of Reference System Plans and Preferred System Plans, or through a procurement order. Sections 6 through 9 discuss the linkage in this direction.

Procurement → Planning

The focus of this section is how the procurement track impacts the planning track.

The planning track of IRP requires clear assumptions for model optimizations and LSEs' individual plans, which are utilized to identify resource needs. Following a procurement order, how certain should it be assumed that the resource needs will be met? Should procurement orders automatically be incorporated into future IRP modeling baselines? The CPUC needs to determine if a procurement order indicates commitment to a pathway or whether a degree of optionality is retained.

A primary objective of the proposed Procurement Framework is to ensure that optimal procurement is executed, in spite of barriers. With the process improvements, mechanisms, and strategies proposed throughout the previous sections, staff's intention is to create a process that results in ordered procurement coming to fruition. However, even with a Procurement Framework in place, some planned procurement may still not come to fruition due to typical development risks.

IRP includes two planning steps, RSP development and PSP development. RSP development is designed to evaluate the appropriate GHG emission planning target for the electric sector and each LSEs, and to identify the optimal mix of electricity resources to meet state GHG emissions and reliability goals. The second step, PSP development, is designed to consider the portfolios and actions each LSE proposes for meeting these goals, to allow the CPUC to review each LSE plan and aggregate LSE portfolios into a single system-wide portfolio, and to consider whether further action is needed to meet state goals. Further action, according to this Procurement Framework, translates to a procurement order. It is important to consider how ordered procurement will be considered in both of the IRP planning track steps, RSP development and PSP development.

Clarifying how procurement orders should be reflected in capacity expansion modeling

The CPUC uses a capacity expansion model to identify portfolios of new and existing resources that meet the GHG emissions planning constraint and responds to reliability needs at least cost. The capacity of baseline resources is an input to capacity expansion modeling, as opposed to candidate resources, which are selected by the model and are incremental to the baseline. Staff must determine to what extent future procurement orders are incorporated into the baseline, as a known input, or whether they are excluded, allowing the model to identify a portfolio of candidate resources different from those already ordered for procurement. Section 6 introduced definitions of "baseline resources" and "planned resources." Here, further detail is provided on baseline resources, and "candidate resources" are also defined.[48]

Baseline resources are resources that are currently online or are contracted to come online within the planning horizon. Being "contracted" refers to a resource holding signed contract(s) with an LSE for much of its energy and capacity for a significant portion of its useful life. The contracts refer to those approved by the CPUC and/or the LSE's governing board, as applicable. These criteria indicate the resource is relatively certain to come online.

Baseline resources include:

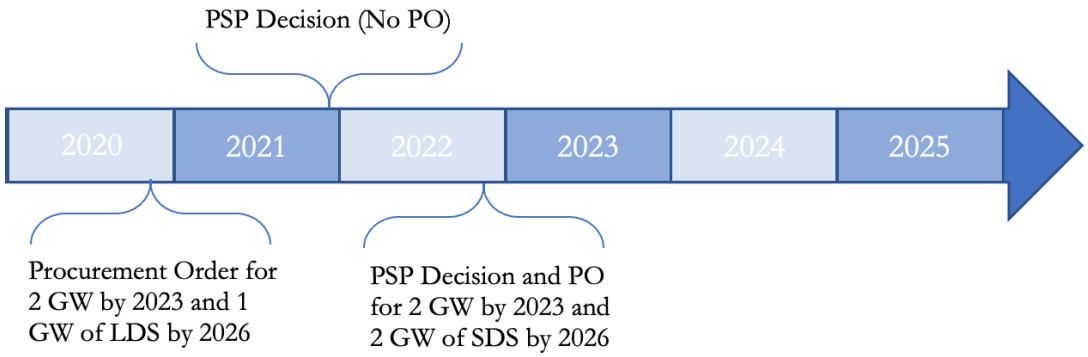
1. Existing resources: Resources that have already been built and are currently available, net of expected future retirements.
2. Resources under development: Resources that have contracts approved by the CPUC or the board of a CCA or ESP and are far enough along in the development process that it is reasonable to assume that the resource will be completed. To reflect the potential for project failure these resources are discounted by 5 percent, a value based on RPS Procurement Plans and stakeholder feedback.
3. Resources not optimized: Future projected resource additions that are expected, but not appropriate for optimization (e.g., achievement of the CPUC storage target).
4. Resources under development in non-CAISO balancing areas: The IRP process does not optimize resource additions for balancing areas outside CAISO, but changes in the generation portfolio of balancing areas outside of CAISO may influence portfolio selection within the CAISO area. Consequently, baseline resources are added to other balancing areas to meet policy and reliability targets outside of CAISO.

Candidate resources represent the menu of new resource options from which RESOLVE can select to create an optimal portfolio. RESOLVE can add many different types of resources, including natural gas generation, renewables, energy storage, and demand response. The optimal mix of candidate resources is a function of the relative costs and characteristics of the entire resource portfolio (both baseline and candidate) and the constraints that the portfolio must meet. Capital costs are included in the RESOLVE optimization for candidate resources, whereas capital costs are excluded for baseline resources.

[48] Refer to Inputs & Assumptions 2019-2020 Integrated Resource Planning, available at: ftp://ftp.cpuc.ca.gov/energy/modeling/Inputs%20%20Assumptions%202019-2020%20CPUC%20IRP%202020-02-27.pdf

The example below depicts an important challenge that may arise as the CPUC directs procurement through multiple orders. The problem is one of inconsistency in the signal sent to LSEs and the market. *Incorporation into Planning Options 1 to 3*, described below, provide various ways in which the CPUC can address this specific issue.

Illustrative Example: Inconsistency between Procurement Orders (PO)



In this example case, in late 2020, the CPUC orders procurement of 2 GW of resources by 2023 and 1 GW of specifically long-duration storage (LDS) by 2026 based on a reliability need. LSEs respond to this order by working jointly to procure pumped storage. They successfully hold an RFI in 2021 and begin to work on an RFO in 2022. In the meantime, the CPUC IRP process continues and a RSP Decision adopted in late 2022 points to the fact that a reliability need continues to exist. Staff follows by conducting procurement need determination which confirms the still existing reliability need. Per the need determination step recommended in section 6 when identifying the gross need, no value is placed on planned resources. Since the LSEs have not yet contracted these resources and are only in the RFO stage, the resources by default are not counted. Therefore, procurement for the full need is ordered.

The new procurement order maintains the 2 GW order for 2023, however, considering that it is already 2022, the procurement order points to 2 GW of short-duration storage (SDS) instead of 1 GW of long-duration storage to address the reliability need. The adjustment from the first order to the second aims to address that it is unlikely that a long lead-time resource can be developed in time, and explicitly allows for other resources such as battery storage.

However, the adjustment in the procurement order, although minor at first glance, can have a significant impact on the signal sent to the LSEs already working jointly to procure the pumped storage. Importantly, a shift like this can set the tone for future inconsistency between procurement orders and can discourage proactive action by LSEs to procure resources. Additionally, the volatility can be as a perceived as a risk by investors and ultimately result in inefficient procurement and increased ratepayer costs.

Below staff proposes a number of options for creating a clear nexus between the procurement track and the planning track of the IRP process to address the above depicted challenge.

10.2. Options for Incorporating Procurement Process Outcomes into Planning

Incorporation into Planning – Option 1: Incorporate the full amount of procurement ordered into the RSP or PSP baseline

Assume the full amount of procurement ordered as a fixed input to future optimizations of incremental candidate resources.

Benefits:

- Simple implementation with minimal upfront work
- Reinforces the procurement order and provides a clear and strong investment signal to developers. If the need identified was found to require a procurement order, it can be assumed that need was found to be necessary under rigorous analysis and a range of futures and does not need to be reevaluated

Disadvantages:

- Does not allow for an updated procurement order based on new information, potentially missing an opportunity to reduce ratepayer costs or more efficiently meet other state goals
- May underestimate resource need determination in planning, and consequently procurement need determination, potentially resulting in a shortfall of procured resources

Incorporation into Planning – Option 2: Incorporate resources into the RSP or PSP baseline only once the procurement is contracted and approved by the CPUC or the LSEs' highest decision-making authorities, as applicable

Once a resource is contracted, use the information contained in the contract, including commercial operations date and various attributes, to update the baseline used in the RSP and PSP.

Benefits:

- Straightforward development of a baseline. This approach simplifies how staff can account for ordered procurement that has since been contracted.
- Minimizes upfront staff work
- Minimizes the risk that future IRP optimizations conducted within the planning track will fail to identify a resource need.

Disadvantages:

- Complicates how staff should then account for ordered procurement that has not yet been contracted. Under this approach a procurement need may be identified in multiple IRP cycles before the contracting and approval is in place, leaving the CPUC with a complex question of how to reconcile the previous procurement orders with more recently identified resource needs.

The portion of the procurement order not included in the future RSP baseline would be reevaluated in the RSP development. If the need is no longer found to be necessary, or different resource types are selected to fill it, it can disrupt the bid evaluation and approval processes already under way or the procurement process more broadly.

Incorporation into Planning – Option 3: Develop an "In Procurement" resource category within the planning track of IRP

Procurement ordered but not yet online would be included in this resource category under future procurement need determination and therefore not be identified as a procurement need again if any of the below criteria are met:

1) When an LSE meets a designated milestone for procurement progress, providing information on resource type and attributes in accordance with a procurement order.

2) When a CPE is designated to execute the procurement and has conducted a viability assessment: An example of this may include an RFI demonstrating that the online date and resource attributes provided for potential procurement options can meet the requirements of the procurement order.

- In the case that a CPE is responsible for procuring resources either as a result of opt-outs, backstop procurement, or front-stop procurement, it is expected that LSEs will reflect their designated portion of that procurement in their IRPs. Similarly, the portion designated to each LSE would be considered to be in the "In Procurement" resource category if it meets the appropriate criteria. Any future identified procurement need allocated to a specific LSE would have to be an incremental need to that already being filled by its respective portion of the CPE procurement.

3) When a resource relies on new transmission development and all of the following occur:

- A CPUC Permitting preassessment indicates that the transmission development required for the procurement of resources is viable. (See *Need Determination – Action 5: Establish a permitting preassessment* process).
- The CPUC transmits a portfolio to the CAISO for the TPP that includes the specific resource.
- The CAISO approves the transmission need.

The amount of resources for which the above criteria have been met:

- Will be labeled as in the "In Procurement" resource category, and that category will be removed from consideration for subsequent procurement orders.
- Will NOT be included in the baseline for optimization or LSE planning under the resource need determination.

Benefits:

- Staff will have a standard manner of incorporating into future modeling work the full amount of resources ordered for procurement, those now contracted (in the baseline) those uncontracted but with a higher level of certainty of procurement (in the "In Procurement" resource category), and those in early stages of planning/procurement (as candidate resources). This reduces staff reconciliation work.
- LSEs will have a clear understanding of what must be accomplished to reduce the amount of procurement need identified and allocated to them in the future.
- This option strengthens the link between CPUC resource planning and CAISO transmission planning, by demonstrating the CPUC is actively working towards ensuring the procurement of resources in alignment with transmission development. Specifically, this is referring to the resources previously transmitted to the CAISO in a base case resource portfolio and resulting in transmission approval by the CAISO Board of Governors.
- Reduces ratepayer costs by minimizing investment in stranded assets.

Disadvantages:

- The portion of the procurement order not included in the future RSP baseline would be reevaluated in the RSP development. If the need is no longer found to be necessary, or different resource types are selected to fill it, it can disrupt the current bid evaluation and approval processes under way or the broad procurement process.
- Would require upfront work to clearly define the "In Procurement" resource category and determine how to account for resources cleanly.

10.3. Recommendations

Phase 1: For use through end of 2021

In the event of need determination conducted in the remainder of this IRP cycle staff recommends that the CPUC implement the following:

Incorporation into Planning – Option 2: Incorporate resources into the RSP or PSP baseline only once the procurement is contracted and approved by the CPUC or the LSEs' highest decision-making authorities, as applicable : Staff's rationale is that this option is the most straightforward and the only administratively feasible option considering the short time frame.

If procurement is ordered in mid-2021 or after initiation of the PSP need determination process it will be difficult to incorporate any of that procurement into the baseline of this cycle of PSP development. However, this may be of little significance due to the fact that it is unlikely that new resources could be contracted rapidly enough in response to procurement ordered in mid-2021 to have significant impact on the outcome of the 2021 PSP. New contracts would therefore be reflected in any need determination conducted in the following IRP cycle.

Phase 2: For use in future IRP cycles

Staff recommends the CPUC takes action to implement the following:

Incorporation into Planning – Option 3: Develop an "In Procurement" resource category within the planning track of IRP : Staff believes that this will create a clear linkage from the procurement track to the planning track and allow the CPUC to more efficiently conduct future need determination. This approach strikes a balance between not reevaluating the need for a portion of the resources and allowing the flexibility to update the need for others. The strict criteria established for very specific circumstances that require a high degree of certainty that the procurement will not change is an important feature that will send a clear signal to LSEs and developers and reduce investment risk.

11. Conclusion: Summary and Assessment of Proposed IRP Procurement Framework

In this section staff summarizes the proposed framework and how it meets the criteria for evaluating options staff put forward in section 4.

The section begins with a focus on Phase 1. Staff puts forth a compilation of all Phase 1 recommendations made throughout the Staff Proposal and evaluates to what extent they, as a whole, meet the defined criteria for a procurement framework. The section then continues with staff doing the same for Phase 2.

In section 4 staff defined two criteria that the framework as a whole, and its regular implementation, should accomplish:

Effectiveness: The likelihood of achieving the overarching purpose of the Procurement Framework by implementing the option.

- The framework facilitates sufficient, timely, and cost-effective procurement.
- The framework incentivizes (rather than disincentivizes) planning or procurement.
- The framework enables California's ability to meet policy goals.

Technical and Administrative Feasibility: The likelihood that an agency/entity can implement the option well given the availability of resources, tools, and data required.

- The framework aligns with other processes of the CPUC to eliminate redundancy and increase efficiency.[49]
- The framework is repeatable and long-lasting while being flexible enough to adapt to new challenges as they arise.
- The framework is feasible (timeline, cost and other considerations) and implementable.

Staff has used the above criteria when evaluating the various options for each step and making recommendations. However, considering the complexity of the issues at hand, staff acknowledges that there are factors that may not have been considered. Staff expects that stakeholder feedback on this Staff Proposal will be significant and informative, and that the final procurement framework is likely to contain several improvements.

Overall, staff finds that Phase 1 recommendations should be moderately effective, with a high likelihood of implementation for urgently considering the potential need for procurement of resources by mid-decade. Phase 2 recommendations improve on Phase 1, to increase the likelihood of the Framework being effective in the long-term. The technical and administrative

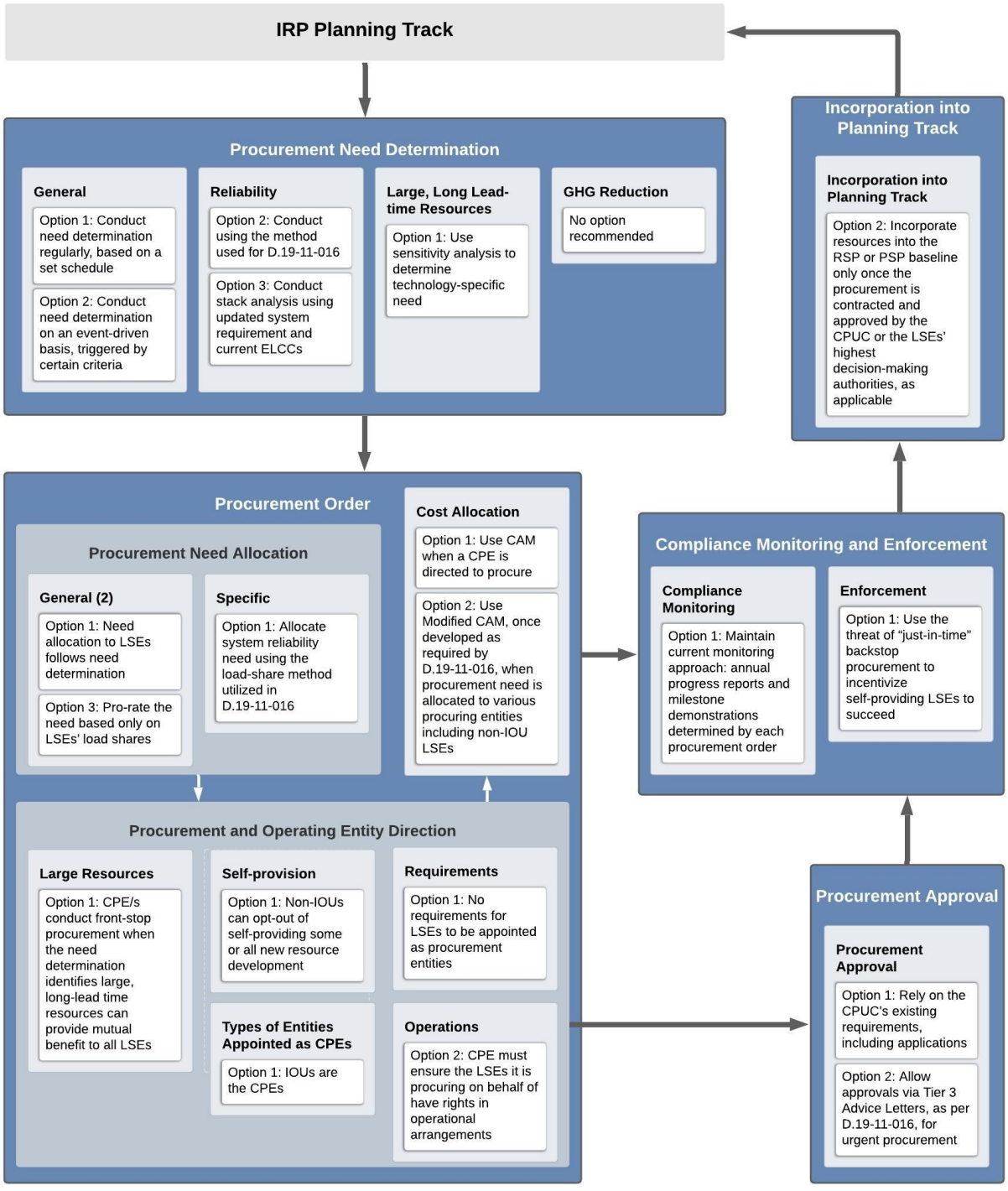
[49] PU Code 454.52 reads "To eliminate redundancy and increase efficiency, the process adopted pursuant to subdivision (a) shall incorporate, and not duplicate, any other planning processes of the commission."

feasibility of Phase 2 is less certain due to the nascent stage of some of the recommended options. For this reason, staff seeks to collaborate with stakeholders to refine the recommended options so that they are highly effective but also feasible to implement.

Phase 1 Summary and Assessment

Staff has compiled all Phase 1 staff recommendations made throughout this Staff Proposal into a single flow chart to summarize how the various recommended options within each step of the procurement process fit together:

Figure 9. Proposed Phase 1 IRP procurement process



A. Effectiveness

The recommendations for each step of Phase 1 were made with careful consideration of the criterion that the framework needs to facilitate sufficient, timely and cost-effective procurement. An effective Phase 1 would result in successful procurement of resources, if found to be necessary, to address urgent procurement needs including mid-decade reliability needs tied to DCPP retirement. For this reason, staff recommends a relatively simple approach to determining the need for large, long lead-time resources, and staff recommends that GHG reduction need determination analysis is not necessary to be conducted within Phase 1. Instead, staff's recommendations for Phase 1 focus largely on addressing reliability needs, given the upcoming retirement of DCPP and the August 2020 rotating outages.

Staff believes that Phase 1 is likely to contribute towards meeting policy goals in the immediate future, for example, by allowing for an expeditious procurement order to ensure a reliable system. Staff acknowledges that a closer evaluation must be conducted to ensure the recommendations for each process step apply to DERs as well as they do to supply-side resources. However, Phase 1, would not result in the meeting of long-term policy goals because it does not adequately solve for the problems described in section 3. Additionally, the degree to which Phase 1 aligns with other processes of the CPUC to eliminate redundancy and increase efficiency is limited. For example, Phase 1 defaults to incorporating resources into the RSP and PSP only once they have been contracted, because there is insufficient time to develop an "in procurement" resource category.

Staff concludes that Phase 1 is moderately effective, with a focus on being most effective with urgent procurement needs, and less effective in identifying and ensuring long-term procurement needs.

B. Technical and Administrative Feasibility

Staff believes that the framework is technically and administratively feasible, per the second criterion. However, this does come at the cost of flexibility. For example, because there is insufficient time to establish a standard for any LSE to serve as a CPE, or to establish a non-LSE as a CPE, Phase 1 defaults to only IOUs serving as CPEs when necessary.

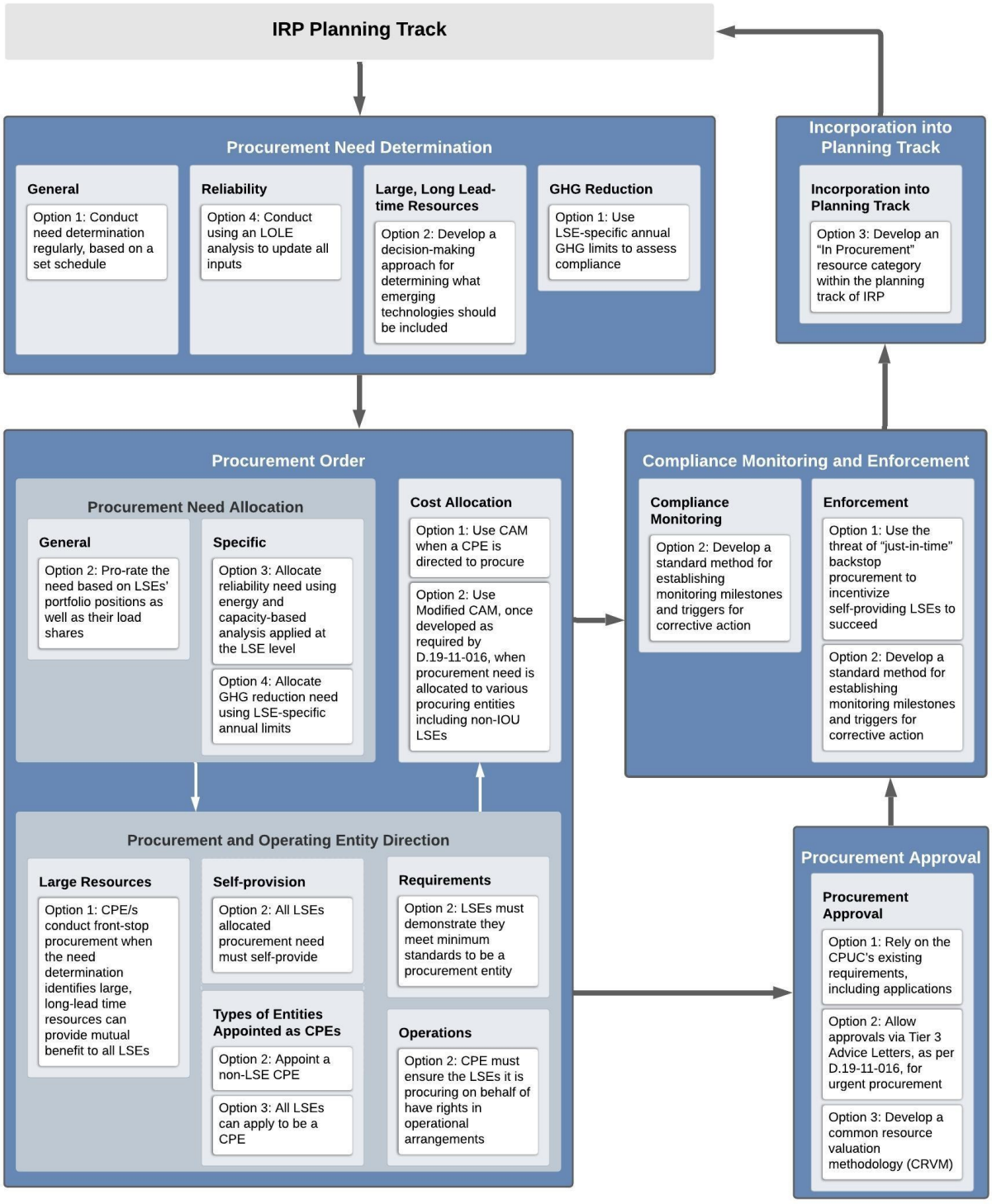
In order to ensure that the framework is repeatable and long-lasting while being flexible enough to adapt to new challenges as they arise, the approach taken by staff is to avoid prematurely implementing options that require establishing of complex standards, methodologies, or other program structures, until they are further assessed during Phase 2. This includes assessment of a penalty structure and a clean resource standard, before recommending the implementation of these additional structures.

Staff certainly sees limitations with its recommendations for Phase 1, however considering the tradeoffs, staff believes that the approach is the best that can be implemented through to the end of 2021. These shortcomings are largely addressed by Phase 2, which is designed to be a long-lasting approach to procurement.

Phase 2 Summary and Assessment

Staff has compiled all Phase 2 staff recommendations made throughout this Staff Proposal into a single flow chart to summarize how the various recommended options within each step of the procurement process fit together:

Figure 10. Proposed Phase 2 IRP procurement process



A. Effectiveness

The recommendations for each step of Phase 2 were made with careful consideration of the criterion that the framework needs to facilitate sufficient, timely and cost-effective procurement. This is apparent in the tradeoffs that staff considered in steps including need determination, need allocation, procurement approval, among others.

Staff believes that the Framework as a whole will enable California to meet policy goals. Staff's recommendations on the compliance monitoring step and the need determination step, such as defined LSE-specific GHG limits, will provide clear expectations to LSEs on what standards must be met, by when, and how. Furthermore, these same recommendations will allow staff to track progress more easily and identify potential procurement issues early. This will shift the CPUC's role to being less reactive and more proactive. Similar to the case for Phase 1, staff acknowledges that DERs are not explicitly addressed by all the recommendations under Phase 2. Staff expects that careful consideration of the unique features of demand-side resources will be important to establishing effective need determination, need allocation and compliance monitoring steps.

Through the need allocation and cost allocation recommendations staff aims that the mechanisms will be conducive to proactive planning and procurement and will not inadvertently disincentivize that desired outcome.

B. Technical and Administrative Feasibility

Staff also believes that the framework is technically and administratively feasible, per the second criterion.

The framework aligns with other processes of the CPUC to eliminate redundancy and increase efficiency. Many of the recommendations rely on or build on existing processes and mechanisms, including those proposed under cost allocation, procurement approval, and enforcement. As noted under section 2.3, staff acknowledges that the IRP process is not the only driver of resource procurement. Various CPUC procurement programs may be impacted by the IRP Procurement Framework that is established. Although this nexus is considered by staff, changes to other programs are outside of the scope of the options evaluated in this Staff Proposal. Staff recommendations aim to complement existing programs, where possible.

In order to ensure that the framework is repeatable and long-lasting while being flexible enough to adapt to new challenges as they arise, per the next criteria, the approach taken by staff is to further assess complex matters such as a penalty structure and a clean resource standard, before recommending the implementation of these additional structures.

In terms of feasibility of the framework as a whole, as noted earlier, staff has made each recommendation with the consideration of feasibility. However, staff acknowledges that with feedback from stakeholders, changes may need to be made to improve the feasibility of implementation.

Staff recognizes that this is a "blue sky" proposal that requires a collaborative effort to refine before a robust procurement framework is in place. Moreover, some of the recommended options, beyond the development of the concepts, will require development and implementation of new methods, criteria, and structures. Staff acknowledges that this will require time and a concerted effort to have a procurement framework and related structures in place for the next IRP cycle.

Next Steps

Staff expects the CPUC to seek comments from stakeholders on the Phase 1 elements of this Procurement Framework in conjunction with feedback on the DCPP replacement analysis that is due to be released by early 2021. Staff expects that comments on Phase 2 content would be sought separately, at a later point, in aid of the CPUC formally adopting a procurement framework.

Staff has identified multiple enabling actions in addition to the recommended options throughout this document. Staff sees these as necessary to facilitate an effective procurement process, and likely to be applicable regardless of the combination of options adopted. These include the following:

- Need Determination
  - *Need Determination – Action 1: Apply "viability factors" to planned* resources
  - *Need Determination – Action 2: Establish standard estimates for length of procurement process based on resource* characteristics
  - *Need Determination – Action 3: Ensure that the IRP filing requirement planning standards reflect the need determination* standards
  - *Need Determination – Action 4: Improve alignment between inputs and assumptions used in the IRP and RA* programs
  - *Need Determination – Action 5: Establish a permitting preassessment* process

- Need Allocation
  - *Cost Allocation – Action 1: Evaluate whether additional cost allocation mechanisms are required*

Implementation of enabling actions will further improve the effectiveness of the procurement process by improving alignment between CPUC proceedings and processes, providing clear expectations to LSEs on what standards must be met, by when, and how, and by providing more certainty about transmission and generation development dependencies.
The CPUC should determine the appropriate schedule for implementing enabling actions. Staff expects that a number of enabling actions may warrant implementation prior to the formal adoption of a final IRP procurement framework.

Appendices

Procurement Characteristics by Resource Type

Table 3. Detailed procurement characteristics by resource type[50]

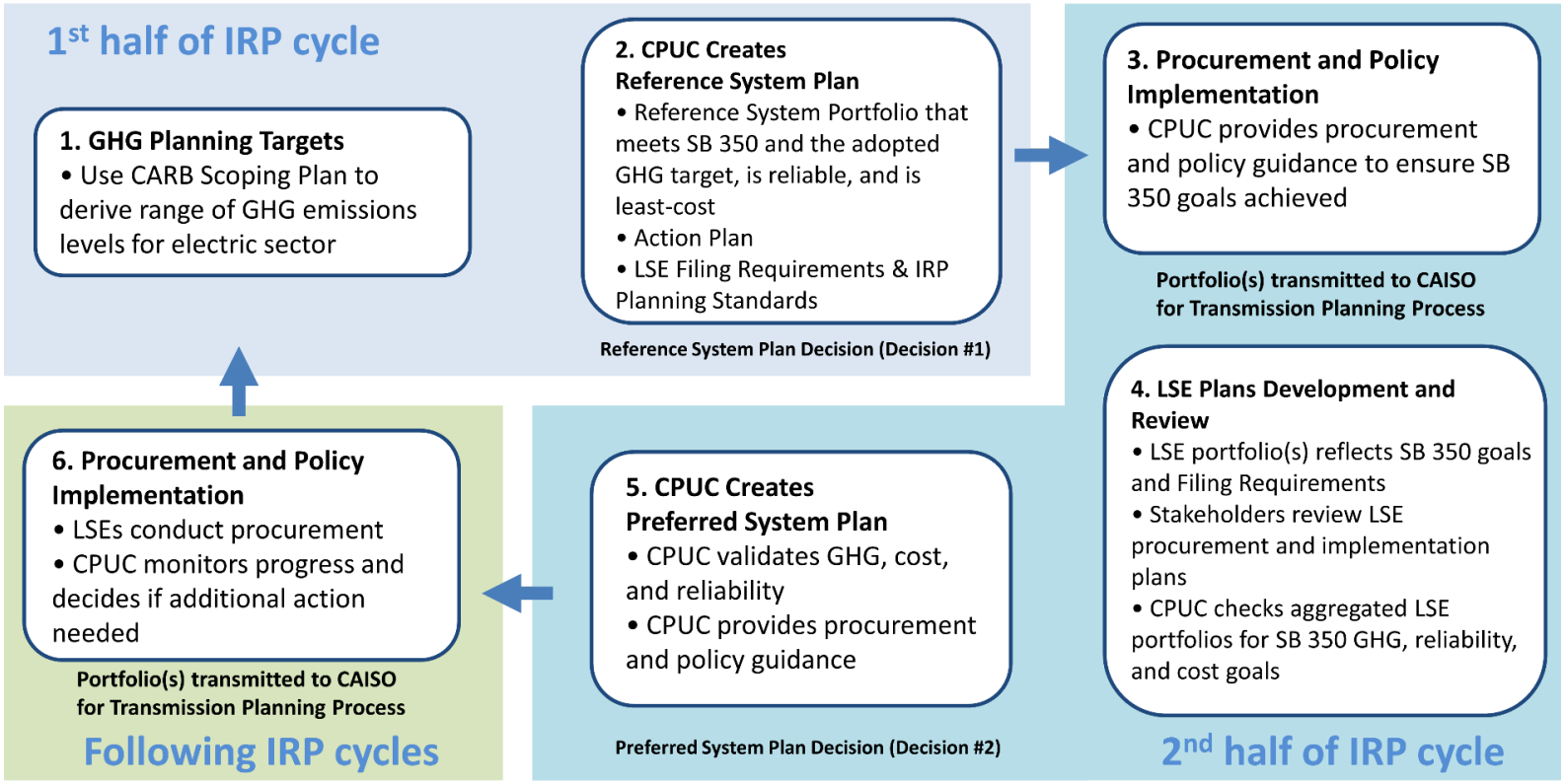
Resource Type	Online Status	Typical Resource Size (nameplate capacity)	Transmission Upgrades Required	Timeline (from solicitation to delivery)	Primary Supporting Programs / Markets	Recent Track Record of Procurement by LSEs
Existing CAISO generators	Online		No	Short	• System RA • Local RA • Flex RA • RPS • Wholesale energy and ancillary service markets	Short tenure: Extensive Long tenure: Moderate
Demand response	New		No	Short	• Demand response programs • D.19-11-016 • Wholesale markets	Moderate
Imports	Online		No	Short	• (Similar to existing CAISO generators)	Extensive
Energy efficiency	New		No	Short	• Energy efficiency programs • D.19-11-016	Extensive
Rooftop PV, BTM battery	New		No	Short	• SGIP	Moderate
Battery storage	New	50 – 200 MW	Unlikely	Medium	• AB2514 Storage Mandate • D.19-11-016 • Wholesale energy and ancillary service markets	Moderate
Solar	New	100 – 400 MW	Potentially	Medium	• RPS • Wholesale energy and ancillary service markets	Extensive
Wind	New	100 – 400 MW	Potentially	Medium	• (As for solar)	Extensive
Geothermal	New	100 – 400 MW	Potentially	Medium-Long	• RPS • Wholesale energy and ancillary service markets • System RA	Moderate
Gas-fired	New	100 – 800 MW	Potentially	Medium-Long	• Wholesale energy and ancillary service markets • System RA	None
Out-of-state wind on new transmission	New	100 – 400 MW	Yes	Medium-Long	• RPS • Wholesale energy and ancillary service markets	Moderate to none

[50] Referred to in section 3.2 of this document

Pumped storage hydro	New	300 – 800 MW	Potentially	Long	• Wholesale energy and ancillary service markets • System RA	None
Offshore wind	New	500 – 1,000 MW	Likely	Long	• RPS • Wholesale energy and ancillary service markets • System RA	None

IRP Cycle Flowchart

Figure 11. IRP cycle flowchart[51]



[51] Referred to in section 6.6 of this document

Acronym Glossary

CAISO	California Independent System Operator
CAM	Cost Allocation Mechanism
CARB	California Air Resources Board
CCA	Community choice aggregator
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CPCN	Certificate of Public Convenience and Necessity
CPE	Central procurement entity
CPM	Capacity Procurement Mechanism
CPUC	California Public Utilities Commission
D.	Decision
DCPP	Diablo Canyon Power Plant
DER	Distributed energy resource
ELCC	Effective load carrying capability
ESP	Electric service provider
FERC	Federal Energy Regulatory Commission
GHG	Greenhouse Gas
GW	Gigawatts
IEPR	Integrated Energy Policy Report
IOU	Investor owned utility
IRP	Integrated Resource Planning or Integrated Resource Plan
LDS	Long-duration storage
LOLE	Loss-of-load-expectation
LSE	Load-serving entity
LTPP	Long-Term Procurement Plan
MMT	Million Metric Tons
MW	Megawatt
MWh	Megawatt hour
NQC	Net qualifying capacity
OTC	Once-through-cooling
PCC	Portfolio Content Category
PCIA	Power Charge Indifference Adjustment
PO	Procurement order
PRM	Planning reserve margin
PSP	Preferred System Plan
PTC	Permit to Construct
PU	Public Utilities
RA	Resource adequacy
REC	Renewable Energy Credit
RFI	Request for Information
RFO	Request for offers
RMR	Reliability Must-Run
RPS	Renewables Portfolio Standard
RSP	Reference System Plan
SB	Senate Bill
SCE	Southern California Edison
SDG&E	San Diego Gas & Electric
SDS	Short-duration storage
TPP	Transmission Planning Process

[END OF ATTACHMENT A]