CPUC Staff Concept Paper on Integrated Resource Planning

CPUC Energy Division

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Abbreviations

AAEE	Additional Achievable Energy Efficiency
BAA	Balancing Authority Area
BTM	Behind-the-Meter
CAISO	California Independent System Operator
CARB	California Air Resources Board
CCA	Community Choice Aggregator
COD	Commercial Operation Date
CPUC	California Public Utilities Commission
DER	Distributed Energy Resources
DR	Demand Response
EE	Energy Efficiency
ELCC	Effective Load Carrying Capability
ESP	Electric Service Provider
EV	Electric Vehicle
GHG	Greenhouse Gas
GWh	Gigawatt hour
IEPR	Integrated Energy Policy Report
IOU	Investor Owned Utility
IPCC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Plan
IRP-LTPP	Integrated Resource and Long Term Procurement Planning
LCA	Life Cycle Assessment
LSE	Load Serving Entity
LTPP	Long-Term Procurement Plan
MMTCO2e	Million Metric Tons of Carbon Dioxide Equivalent
MW	Megawatt
MWh	Megawatt hour
N/A	Not Applicable
NREL	National Renewable Energy Laboratory
OIR	Order Instituting Rulemaking
PG&E	Pacific Gas and Electric Company
PHC	Pre-hearing Conference
POU	Publicly-owned utility
Pub. Util. Code §	California Public Utilities Code Section
PV	Photovoltaic
RFO	Request for Offers
RPS	Renewables Portfolio Standard
SB	Senate Bill
SCE	Southern California Edison
SDG&E	San Diego Gas & Electric
SMJU	Small and Multi-jurisdictional Utility
TBD	To Be Determined
TOU	Time-of-Use
TPP	Transmission Planning Process
ZEV	Zero Emissions Vehicle

Definitions

CPUC-preferred portfolio: the multi-LSE portfolio identified by CPUC as most responsive to statutory requirements per Pub. Util. Code 454.51.

components (or IRP framework components): the parts of the IRP framework

element (or IRP element): a type of input, output, or activity that is a part of the overall IRP process

filing entity: an entity required by statue to file an IRP with CPUC

future: a set of assumptions about future conditions, such as load or gas prices

governing board: the authority responsible for regulating rates of an LSE whose rates are not under CPUC jurisdiction

IRP: integrated resource plan; the full set of documents and information submitted to CPUC as part of the IRP process

IRP 2017: the first cycle of the CPUC's IRP process

IRP 20XX: the CPUC's IRP process that is expected to be in place after IRP 2017

IRP features: the basic constituent parts of the IRP; the IRP elements that filing entities must produce as outputs

IRP framework: a high-level specification of the IRP Process that includes the following components:

- definitions of the IRP elements;
- division of labor among filing entities and CPUC;
- categories of guidance for filing entities;
- categories of internal guidelines for CPUC

IRP process: integrated resource planning process; the repeating cycle of activities, inputs, and outputs through which IRPs are prepared, submitted, and reviewed by the CPUC

LSE-preferred portfolio: the portfolio preferred by an LSE as the most suitable to its own needs; submitted to CPUC for review as one feature of the overall IRP

portfolio: a set of supply or demand resources that provide electric services

scenario: a portfolio together with a set of assumptions about future conditions

Introduction

Purpose of this Paper

The purpose of this paper is to:

- Serve as a high-level, preliminary concept piece that informs the development of a draft staff proposal on IRP (to be issued in December 2016).
- Propose a set of guiding principles for developing an integrated resource planning process (IRP process) at the California Public Utilities Commission (CPUC).
- Identify the essential elements, and underlying terminology, that the IRP process at the CPUC must include, as well as the primary options for implementing the process.
- Solicit feedback on key conceptual issues related to the integrated resource planning process. Each issue will be the subject of future guidance for load serving entities (LSEs) required to file integrated resource plans (IRPs). The issues include:
    - A conceptual framework for the CPUC's IRP process, with emphasis on the 2017 IRP cycle and the features of the first IRPs to be filed with the CPUC.
    - A workplan for developing additional content for the IRP proposal to be issued in December 2016.
    - Scenario development, IRP modeling framework, GHG target-computation,[1] and process alignment.
    - Potential electricity market and regulatory issues to be addressed.

CPUC staff will host a public webinar in mid-August to present the concepts and issues contained in this paper, the workplan for moving forward toward the adoption of guidance for the IRP process, and to allow parties to ask clarifying questions. Staff will also be requesting informal written party comments based on textbox questions embedded throughout this paper. Following receipt of those comments, staff will host a public workshop in September to explore in more detail the options presented for implementing an IRP process. The proposed guiding principles and high-level conceptual elements of the IRP process in this paper are designed to facilitate a deeper discussion of the more detailed aspects of the IRP process during the workshop. Staff will use the results of the workshop, in addition to post-workshop written comments, to inform the draft staff proposal to be released in December 2016 for formal party comment on the record of the proceeding (R. 16-02-007).

Figure 1 provides an estimated schedule of IRP process development activities, beginning with this draft staff concept paper and leading to adoption of the IRP process, pursuant to Pub. Util. Code 454.52. It

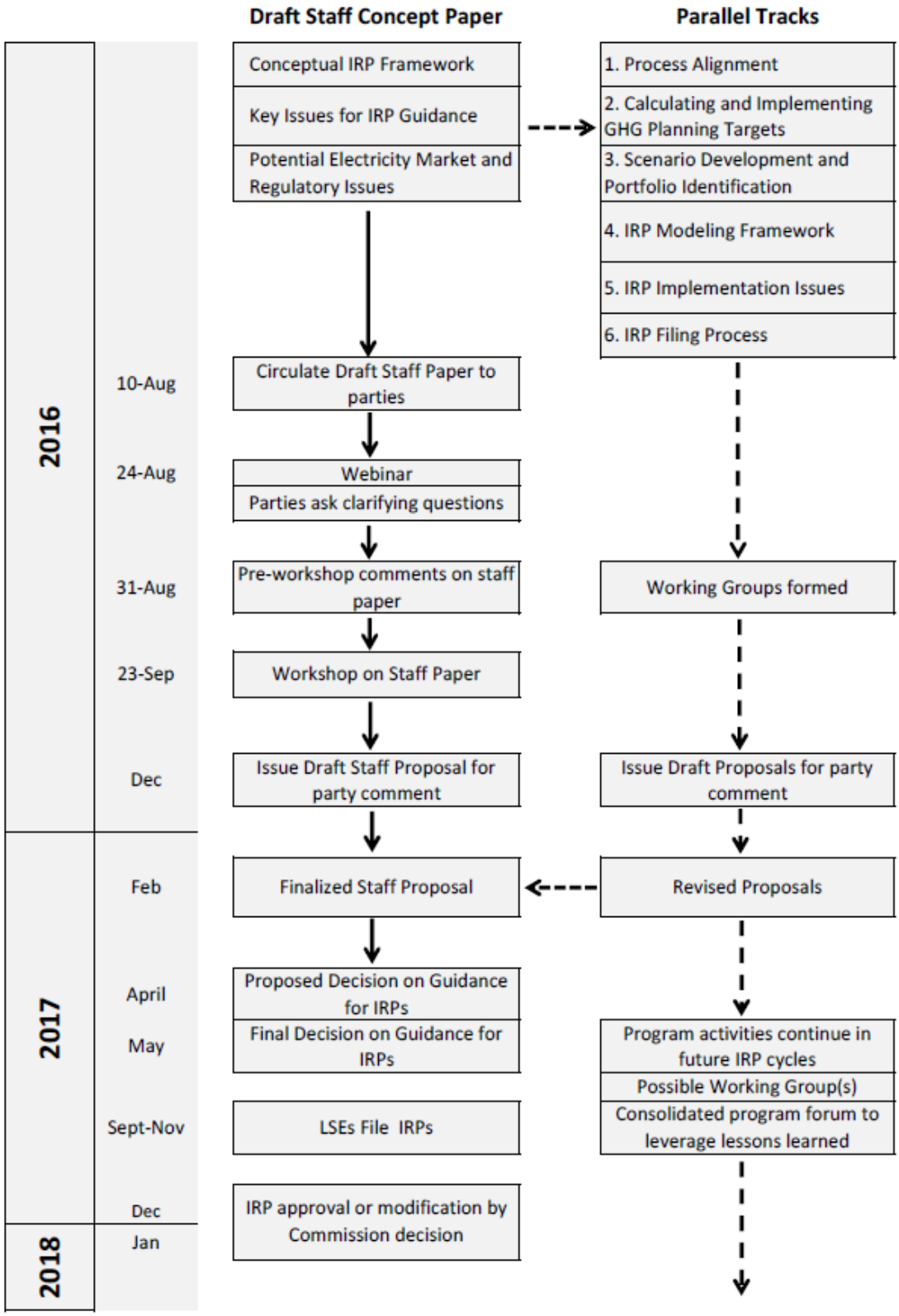
[1] Pursuant to SB 350, the California Air Resources Board (CARB) 2017 Scoping Plan will provide a range of GHG emissions expected to represent the electricity sector in 2030. The CPUC and California Energy Commission (CEC) are expected to develop the method to apportion this range to LSEs within their respective jurisdictions.

also illustrates separate work tracks that will contribute to the development of the Staff Proposal, to be issued in December 2016 and finalized in February 2017, and leading to a final Commission Decision adopting guidance for the 2017 CPUC IRP process in May 2017. Several working groups will be initiated in late August to inform the Staff Proposal, and staff will provide additional information regarding the scope of work and proposed deliverables for each working group in mid-August. Note that the Process Diagram reflects the schedule outlined in the Scoping Memo[2] for the Commissioner's IRP-LTPP Rulemaking (R. 16-02-007), which anticipates IRP filings by LSEs in fall 2017, with IRP approval or modification by Commission decision in late 2017 or early 2018.

IRP 2017 will serve as the initial implementation phase for the CPUC's IRP process. The vision proposed for the IRP process beyond the 2017 cycle is described in more detail in later sections (see Framework Component #2: Division of Labor). In general, staff expect the implementation of future IRP cycles to continue through various procedural vehicles (e.g., workshops, working groups, rulings, program forums, etc.), and for those cycles to build upon the work products and lessons learned in IRP 2017.

[2] http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M162/K358/162358082.PDF

Figure 1. Process Diagram for Development of the IRP Staff Proposal and Filing of 2017 IRPs.



Background on SB 350: New Opportunities and Challenges for CPUC's Long Term Resource Planning Process

Senate Bill (SB) 350, known as the Clean Energy and Pollution Reduction Act of 2015, introduces a new statewide scale to resource planning and requires the Commission to support the State's efforts to meet a goal of achieving a 40 percent reduction in GHG emissions below 1990 levels by 2030. California's electricity is served by a diverse array of LSEs, and the state has numerous policy mandates already in effect (energy efficiency, demand response, renewables portfolio standard, energy storage, alternative-fuel vehicles, etc.) that are being achieved through a combination of markets, resource planning, policy mandates, and infrastructure investments. The GHG emissions reduction aspect of SB 350 means that the Commission must guide resource decisions across CPUC-regulated LSEs and across the various CPUC resource programs (e.g., energy efficiency (EE), demand response (DR), renewables portfolio standard (RPS), storage).

SB 350 changed the CPUC's long-term resource planning activities in two important ways, requiring the CPUC to:[3,4,5]

1. Actively identify a preferred portfolio of resources that meets multiple objectives including minimizing costs, maintaining reliability, and reducing greenhouse gas emissions (Pub. Util. Code § 454.51); and
2. Oversee an integrated resource planning process involving a wide range of load-serving entities (Pub. Util. Code § 454.52).

These two new statutory responsibilities present opportunities and challenges, including:

Opportunities

- Analyze the electric sector's role in achieving California's statewide GHG targets and present the policy decisions needed to accomplish the reductions to stakeholders and decision makers.
- Evaluate supply and demand side resource programs against common set of objectives: system reliability, GHG emission reductions, and cost effectiveness.
- Identify and implement administrative efficiencies across supply- and demand-side resource programs.

[3] The full text of Pub. Util. Code Sections 454.51 and 454.52 are provided in Appendix A.
[4] The full set of statutory, Commission, and other requirements that the IRP process must address is listed in Appendix B.
[5] Key conceptual differences between the predecessor LTPP proceeding and the current 2016 LTPP/IRP proceeding are shown in Appendix C.

Challenges

- Need for new analytical tools and methodologies, such as modeling that optimizes a mix of demand-side and supply-side resources that meet reliability, GHG reduction and cost-effectiveness constraints.
- Number and diversity of LSEs required to file IRPs (e.g., large investor-owned utilities (IOUs), small and multi-jurisdictional investor-owned utilities (SMJUs), community choice aggregators (CCAs), energy service providers (ESPs), co-operatives (co-ops)).
- Number and diversity of CPUC resource programs and their associated policy and planning frameworks (e.g., EE, DR, RPS, storage).
- Need to account for the effects of existing resources across multiple jurisdictions during optimization modeling and selection of preferred portfolios.
- Significant uncertainties about the future, including the rate and type of technology innovation, resource interdependencies (e.g., solar PV and storage), load forecasting (e.g., the rate of EV adoption and customer generation), impacts from potential regionalization of the California Independent System Operator (CAISO), and the expansion of DERs across the state.
- Statutory requirement that the Commission adopt, by no later than the end of 2017, a process for LSEs to file an IRP.

Guiding Principles for IRP Process Development

The guiding principles listed below are intended to establish a foundation on which decisions should be made regarding implementation of Section 454.52, i.e., the design of the CPUC's IRP process. Parties' responses to the questions included throughout this paper should always be made with reference to these guiding principles. The order of these principles does not indicate priority.

1. The structure and design of the IRP process should prioritize minimizing customer costs while meeting the state's other policy goals.
2. The IRP process should be transparent and accessible to the extent possible for parties, members of the public, and customers of each LSE.
3. The IRP process should provide clear and consistent market signals to facilitate sufficient, timely, and cost-effective technology and infrastructure investments.
4. Filing entities should have the flexibility to respond to the changing landscape of technology, electric system needs, market conditions and market opportunities, and the IRP process should recognize that filing entities have different governing bodies and procurement processes.
5. IRP planning activities should be coordinated with the Commission's resource-specific proceedings that guide resource procurement and investment as required by statute to the maximum extent feasible.

6. The IRP process should be designed to align, as much as possible, with related planning processes of other state agencies and entities, while avoiding any redundancy or conflict with other state policies and programs.

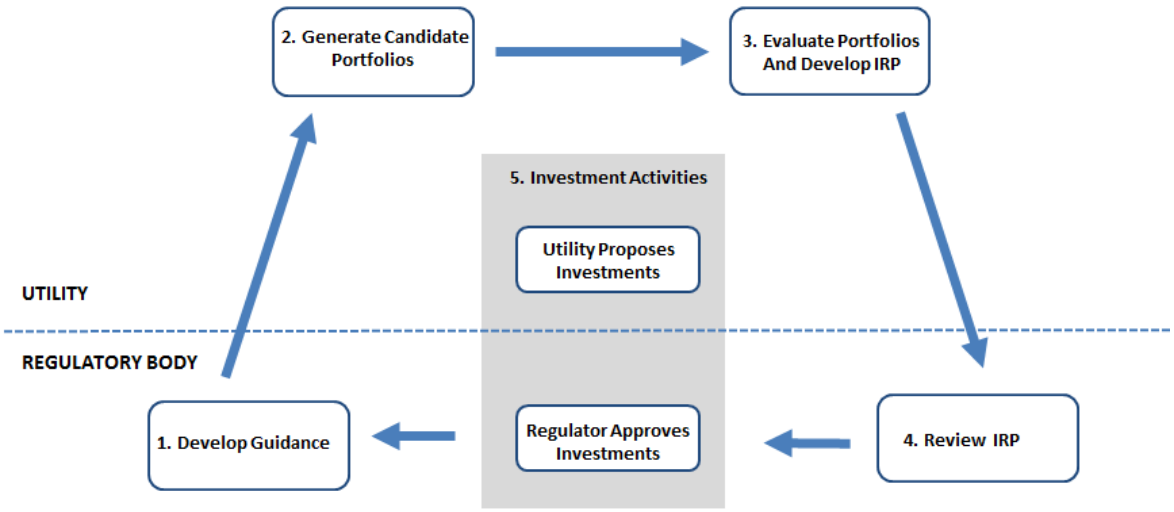
Questions:

1. Are any of the guiding principles inconsistent with any statutory, Commission, or other requirements? If so, please identify the principle, explain the inconsistency, and suggest how the inconsistency should be resolved.
2. Are there any additional guiding principles that should be included? If so, describe the guiding principle and explain why it should be included.

Conceptual Integrated Resource Planning Framework

Integrated resource planning in the electrical sector can take many different forms, but generally involves a core set of activities that together comprise a cycle of interaction between a utility and a regulatory body. A schematic diagram of a generic IRP planning process is presented in Figure 2.

Figure 2. Schematic Diagram of a Generic Integrated Resource Planning and Procurement Process



There are many ways to define and organize the generic IRP planning process depicted in Figure 2 in order to meet the CPUC's many specific statutory requirements and policy goals. CPUC's IRP process itself is likely to vary by LSE and to evolve over time. To help elucidate the available options, staff drafted a more detailed framework for an IRP process appropriate for a California context.

To systematically explore the variety of options available for implementing the IRP process, staff has organized the framework into four components:

1. **Elements of the CPUC IRP Process**: What are the required elements (activities, outputs, and inputs) of the IRP process?
2. **Division of Labor**: Which entities are responsible for which elements of the IRP process?
3. **CPUC's Guidance for Filing Entities**: For the elements that the LSEs are responsible for, what type of guidance should the CPUC provide to the entities that are generating/performing those elements?
4. **CPUC Responsibilities for IRP**: For the elements that the CPUC is responsible for, what are the actions that the CPUC should take in the 2017 IRP filing cycle?

For each of the above, staff provide a brief summary of available options, recommendations, a rationale for the proposal, and a set of questions for parties to consider. Staff also propose to distinguish between the IRP process in place for the first planning cycle commencing in 2017 (IRP 2017) and the IRP process in place in future planning cycles (IRP 20XX). As noted previously, while the central focus of the staff paper is on IRP 2017, in several places staff describes an IRP process that could be established for future cycles. The work products developed and lessons learned from IRP 2017 are expected to inform those future cycles.

1. Framework Component #1: Elements of the CPUC IRP Process

This component of the IRP framework serves two purposes: 1) identifies a reference set of required elements that the CPUC's IRP process must generally include; and 2) establishes a common vocabulary for the required elements of CPUC's IRP process.

The list below enumerates and describes the elements that the CPUC's IRP process is expected to include. The elements are organized into three categories: activities (which match the activities depicted in Figure 2), outputs (specific work products developed during the overall IRP process) and inputs (information required to perform the activities and produce the outputs). The entity responsible for each element is indicated with brackets, and potential requirements for each element are also listed where applicable. This list is not meant to apply to any specific LSE or type of LSE, but to reflect the general requirements for the CPUC's IRP process. Options for the specific responsibilities of individual LSEs, and how the IRP process may evolve over time, are discussed in the next section.

A. Activities

1. **Collect Input Data [CPUC/LSEs]**: Gather the information needed to generate a portfolio in the appropriate format.
2. **Identify CPUC-Preferred Portfolio [CPUC]**: Generate multiple portfolios (e.g., through capacity-expansion optimization modeling) and identify the portfolio that best fulfills statutory requirements of Pub. Util. Code § 454.51 and state policies and goals.
3. **Develop Guidance [CPUC]**: Determine requirements for all inputs, outputs, and processes to be used by LSEs in the development of their own portfolios and IRPs.

4. **Generate LSE Portfolios [LSE]**: Generate a set of LSE-specific candidate portfolios to evaluate.
5. **Demonstrate Portfolio Compliance [LSE]:** Validate the compliance of candidate portfolios with key requirements, such as sufficient local and system capacity and flexibility as well as applicable policy and scenario standards.
6. **Analyze Portfolio Risks and Impacts [LSE]:** Characterize risks, costs, and benefits, including important areas of uncertainty, of candidate portfolios for all relevant programs, policies, and state goals.
7. **Recommended Portfolio [LSE]**: Recommend a portfolio that best fulfills statutory requirements and meets individual LSE needs.
8. **Develop IRPs [LSE]**: Develop documentation to describe candidate portfolios, recommended portfolio, action plan, any identified procurement needs.
9. **Review IRPs [CPUC]**
    a. **Determine IRP Compliance:** Determine whether filed IRPs meet all applicable requirements, such as whether recommended portfolio includes sufficient system or local capacity and flexibility.
    b. **Authorize Procurement:** Evaluate whether IRP has adequately demonstrated that additional procurement is justified, including procurement to ensure sufficient system or local capacity and flexibility.
10. **Conduct and Approve Procurement [CPUC/LSE/Governing Board for CCAs]:** Conduct and approve specific procurement activities, such as all-source RFOs, programmatic-driven procurement, or tariff changes (e.g., RPS feed-in tariff), that may take place outside the IRP proceeding.

B. Outputs

1. **IRP Filing Guidance [CPUC]**: CPUC guidance on how IRPs should be developed, what IRPs should include, and filing procedures and timing.
2. **Integrated Resource Plan [LSE]**
    a. **Candidate Portfolios:** Candidate portfolios reflect various possible sets of resources, including applicable scenario standards, required data tables, narrative descriptions of each portfolio, and a description of processes used to generate those portfolios.
    b. **LSE-Recommended Portfolio:** The candidate portfolio recommended by the IRP filer to represent the best option for meeting all IRP goals and objectives, including a narrative rationale for recommendation, with reference to statutory requirements of Pub. Util. Code § 454.51 and other applicable standards.

c. **Action Plan:** All activities necessary to support the realization of the recommended portfolio, including infrastructure and non-infrastructure procurement, pilot studies, and data collection efforts.

d. **Procurement Authorization Request:** If justified by the recommended portfolio, request for authorization of any incremental resources not otherwise authorized, including a rationale for authorization, and a rationale for cost allocation associated with any requested procurement.

3. **IRP Approval or Certification [CPUC]**: CPUC recognition that an IRP is approved or certified.
4. **CPUC-Preferred Portfolio [CPUC]**: The portfolio that CPUC identifies as the most preferred pursuant to Pub. Util. Code § 454.51.
5. **Procurement Authorization [CPUC/Governing Board for CCAs]**: Approval of the procurement identified in a filed IRP and any residual procurement necessary to ensure sufficient system or local capacity and flexibility. Includes determination of cost allocation across LSEs.

C. Inputs

1. **Resources**:[6] All committed, existing and potential resources that could be used to meet future needs and all relevant resource attributes.
2. **Load Forecast**: Load that must be served using the resources in the filed IRP, including the Load Forecast, Load Shape tables, and documentation of load forecast data development, each consistent with applicable data standards.
3. **Transmission Capability and Upgrade Costs**: Capability of existing transmission system in different locations to accommodate new resources and cost of upgrades to improve capability, including Transmission Capability and Cost tables consistent with applicable data standards.
4. **Policies and Scenarios Guidance [CPUC]:** Procurement and investment requirements, policy goals and limits, and forecasting uncertainties.
5. **Modeling Guidance [CPUC]:** Common assumptions and metrics for conducting modeling.

Questions

3. Are there any additional elements missing from the activities, outputs, and inputs described? If so, please explain which additional elements are necessary.
4. Should any of the proposed required elements be eliminated or consolidated? If so, please explain why doing so will facilitate the development of an IRP process that is consistent with the guiding principles.

[6] Responsible entities may vary.

2. Framework Component #2: Division of Labor

The magnitude and complexity of the California electrical system and regulatory landscape raise a fundamental scoping question for CPUC's IRP process: Which entities are responsible for which elements of the IRP? Three possible approaches are described below.

Option A: LSE-Focused Approach

One approach would involve each LSE taking responsibility for all of the elements of its own IRP, allowing each LSE to develop a plan that best reflects its own needs and interests. Such an approach would involve having the CPUC use its own resources and tools to integrate individual LSE IRP portfolios into a multi-LSE portfolio that would serve as the CPUC-preferred portfolio. A shortcoming of this approach is that, at high penetrations of renewable energy resources, the investment decisions of each LSE have the potential to significantly affect each other. For example, the addition of new solar PV resources by one LSE could drive down the value of additional solar PV resources for another LSE. Consequently, developing portfolios in isolation could lead to higher overall system costs than if they were developed in a more coordinated fashion.

Moreover, under the LSE-focused approach, it would be difficult for CPUC to approve or reject any individual LSE IRP on the basis of whether it cost-effectively addresses statutory requirements, because there would be no alternative, broader portfolio against which to compare it.

Option B: CPUC-Focused Approach

Another approach would involve CPUC taking primary responsibility for most of the elements, with limited input from LSEs. Such an approach would involve the CPUC developing a multi-LSE optimal portfolio, potentially through the use of a capacity expansion-type optimization modeling tool. CPUC would also determine each LSE's share of that portfolio. This arrangement would have the benefit of identifying challenges and opportunities that arise from the interaction of the utilities' individual electrical systems that would be more difficult to assess if each utility developed its own separate IRP. It would also simplify IRP review, since review would be limited to non-portfolio content, such as the LSE's action plan.

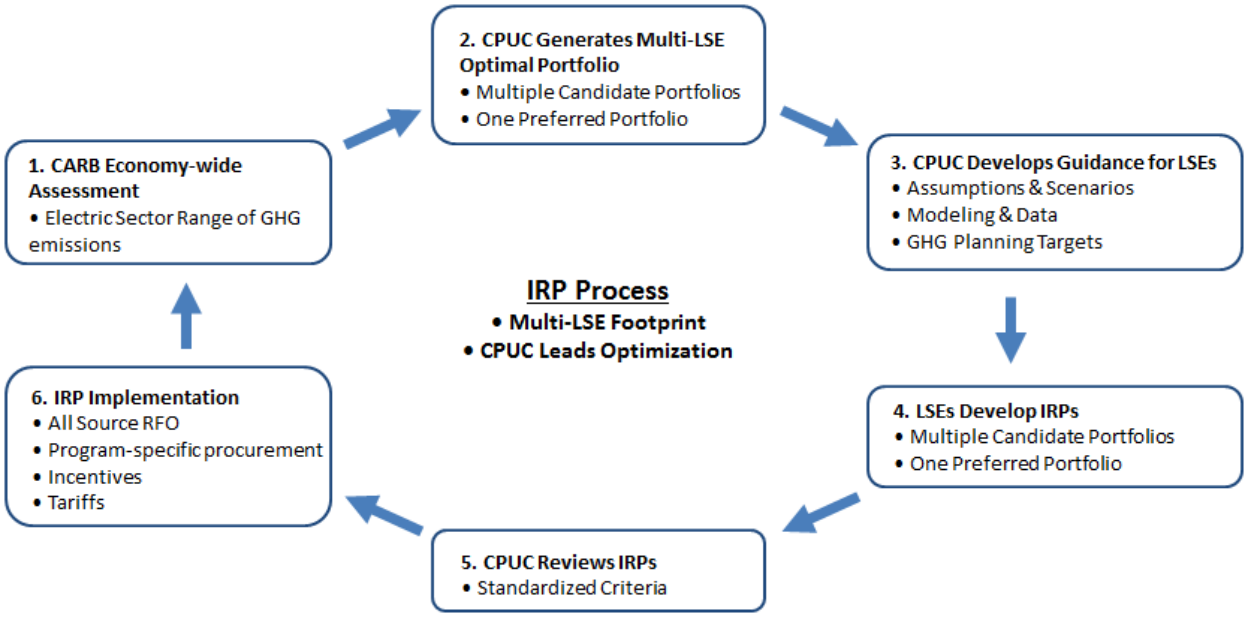
On the other hand, a CPUC-focused approach may not fully or effectively account for LSE-specific needs. It may limit LSEs' ability to pursue solutions that best fit their specific load and resource portfolios, resulting in portfolios that are significantly suboptimal for individual LSEs. This approach would also be very resource intensive for the CPUC, which currently lacks the ability to develop and test a portfolio that is customized to each individual LSE's needs. Because the optimal portfolio needs to be finalized prior to the Commission Decision on IRP guidance in spring 2017 (see Figure 1), there is insufficient time for CPUC staff to accomplish Option B during the IRP 2017 cycle.

Options A and B represent extremes along a continuum of responsibility, i.e., there many different ways of dividing up responsibilities between the CPUC and LSEs. For the 2017 cycle of the CPUC's IRP process, and as a foundation for future IRP cycles, staff propose a hybrid approach: Option C.

Option C: Hybrid Approach

Staff propose a hybrid approach based on the production of a multi-LSE optimized portfolio that informs individual LSE IRPs (see Figure 3). This approach is similar to Option B, in that the CPUC would lead an effort to produce least-cost portfolio(s) that covers all LSEs under its jurisdiction. However, once the multi-LSE optimized portfolio is provided, individual LSEs would be able to use elements of that portfolio as a benchmark for generating their own LSE-specific portfolios, customized to meet their individual needs.

Figure 3: Concept Diagram for the IRP Process: California Multi-LSE Footprint, with work to develop preferred portfolio led by CPUC



Option C offers similar benefits to Option B, in that they both utilize the multi-LSE optimal portfolio generated by the CPUC. In addition to accounting for the interaction of the LSEs' individual electrical systems and simplifying the IRP review process, the multi-LSE optimal portfolio approach accomplishes the following:

- Helps the state minimize the cost of achieving SB 350 goals. The CPUC-generated multi-LSE portfolio would represent a least-cost, optimal statewide solution based on public planning level data to achieve the state's GHG goals and satisfy reliability and RPS requirements.
- Facilitates LSE IRP preparation. The portfolio would be built with public data and provide valuable information to the LSEs about the relative cost-effectiveness of resource additions and potential retirements across the state.
- Provides information for future policy and planning decisions. It would allow information from results of the 2017 IRP cycle, following LSE IRP implementation, to feed back into future decision making and development of the next multi-LSE preferred portfolio. Specifically, the results could

be used by decision makers and regulators to better understand the policy directions that are most promising and cost-effective for the state. This approach has the added advantage of encouraging consistency in common datasets across multiple entities, which benefits both the LSEs and the CPUC in their planning and modeling processes during future IRP cycles.

However, Option C would offer distinct advantages over Option B, including:

- Allows LSEs to choose from a common reference point the elements that best fit their load and resource portfolio. Rather than depending on specific procurement direction from the CPUC, LSEs would have the flexibility to use their own models and prepare their own IRPs accounting for their specific resource and program costs.
- Creates a level playing field for all CPUC-jurisdictional LSEs, ensuring that each entity can meet IRP requirements under a common set of guidelines, but also acknowledging that different LSE types have different needs and requirements to fulfill.
- Accounts for the time and resource limitations of CPUC staff.

In generating the multi-LSE optimal portfolio, the CPUC would represent information on existing resources from publicly-owned utilities (POUs) outside its jurisdiction to appropriately account for the effects of those resources on the portfolio that is preferred for those LSEs within its jurisdiction. If available, CPUC could represent any future POU resources, such as information from the 16 POU IRPs filed with CEC,[7] as "fixed" quantities that are not subjected to the optimization exercise.[8]

Under Option C, staff propose that the three large IOUs develop an IRP for serving their respective bundled loads. CCAs and ESPs would be responsible for filing their own "short form" IRPs. SMJUs would be responsible for "short form" IRPs, or may submit an IRP prepared for another state that requires them. Co-ops would be permitted to submit individual or joint "short form" IRPs. The proposed division of labor is summarized in Table 1. The required features of "long form" and "short form" IRPs are shown in Table 2.

The CPUC would lead the multi-LSE optimization modeling effort, providing key policy and modeling inputs and guidance on filing requirements, and reviewing and approving or certifying the submitted IRPs. CPUC's review would include verifying that LSE-recommended portfolios contain sufficient local or system capacity and flexibility, either through independent modeling or review of LSE modeling results.

[7] The POU IRP requirement of SB 350 applies only to POUs with an annual electrical demand exceeding 700 GWh, as determined on a three-year average commencing January 1, 2013. A total of 16 POUs must adopt IRPs and an updating process by January 1, 2019.

[8] CPUC would coordinate closely with CEC and POUs to determine the feasibility and desirability of pursuing this option.

Table 1. Summary of Proposed Division of Labor for IRP 2017

Entity	Responsibility	Type of Review by CPUC
Large IOUs	• Develop Long Form IRP • Candidate Portfolios • Recommended Portfolio • Action Plan • Authorization Request, if needed	• IRP approval • Procurement authorization
CCAs	• Develop Short-Form IRP • Recommended Portfolio • Evidence of Integration Self-Supply* • Action Plan	• IRP certification
ESPs	• Develop Short-Form IRP	• IRP approval
SMJUs	• Short-Form IRP (or IRP submitted to other states)	• IRP approval • Procurement authorization
COOPs	• Joint, Short-Form IRP	• IRP approval
CPUC	• Develop Multi-LSE Preferred Portfolio • Develop Guidance • Review IRPs • Authorize Procurement/Investment, if appropriate	N/A

* While Section 454.51 requires LSEs to must submit proposals for incremental procurement to satisfy their renewable integration needs, this requirement is optional for CCAs, so they alone have the burden of providing evidence of integration self-supply in their IRPs.

Table 2. Required IRP Features by LSE

LSE Type	IRP Type	Required IRP Features
Large IOUs	Long Form	• Candidate Portfolios • Recommended Portfolios • IOU-Specific Action Plan • Procurement Authorization Request (may be IOU-specific or to address system need)
CCAs	CCA Short Form	• Recommended Portfolio • Evidence of Integration Self-Supply • Action Plan
ESPs	ESP Short Form	• Recommended Portfolio • Action Plan
SMJUs	SMJU Short Form or Other State IRP	• Recommended Portfolio • Action Plan
COOPs	COOP Short Form	• Joint Recommended Portfolio • Joint Action Plan

Regarding process (Table 3), this approach would involve a biennial[9] cycle initiated in the first quarter of every other year with an assigned commissioner ruling (ACR), with Year 1 serving as the planning year, and Year 2 serving as the update year. The CPUC ACR would contain the requirements that filers must follow to prepare and submit their individual IRPs. The ACR would include reference to a multi-LSE portfolio generated by CPUC staff and would order LSEs to file IRPs consistent with the requirements. The LSEs would then prepare and file their IRPs in the IRP proceeding; CPUC staff would review the IRPs; and the Commission would issue a single Decision that either accepts or rejects each LSE's submittal. If any LSE's IRP includes a request for procurement authorization, that request would be addressed through a separate decision.

For IRP 2017, the initial action to order LSEs to file IRPs and enumerating the filing requirements would be in the form of a Decision, whereas for future IRP cycles, the initial action would be an ACR.

Table 3. The Procedural Steps for the Proposed IRP Approach

Step	Description	Procedural Vehicle	Timing
1. CARB Economy-wide Assessment	CARB develops a range of GHG emissions associated with the electric sector	CARB process; outside CPUC	• 2017: Spring • 20XX: Unknown
2. CPUC Generates Multi-LSE Portfolio	CPUC generates a multi-LSE portfolio to serve as guidance to individual LSEs	Staff activity; informs Step 3	April of Year 1
3. CPUC Issues Guidance for LSEs	CPUC issues specific IRP requirements and orders LSEs to file IRPs	• 2017: Decision in R.16-02-007 to initiate IRP • 20XX: Assigned Commissioner Ruling or Decision	
4. LSEs Develop IRPs	LSEs prepare IRPs per CPUC requirements	IRPs are Formally Filed in R.16-02-007	Q3 of Year 1
5. CPUC Reviews IRPs	CPUC approves or rejects individual LSE IRPs	Decision in R.16-02-007	Q4 of Year 1
6. CPUC Approves Procurement	CPUC approves any incremental procurement requested in IRP	Decision in R.16-02-007 or other appropriate proceeding.	Q1-Q2 of Year 2

[9] The biennial frequency would maintain existing collaboration of the CEC, CAISO, and CPUC per the CPUC-CEC-CAISO LTPP/TPP Process Alignment.

Questions

5. Which Option do parties prefer: A, B, or C? If not Option C, please provide your rationale and include consideration of any potential drawbacks or adverse impacts.
6. What electricity market, regulatory, and/or operational implementation issues may emerge under Option C? Please identify potential solutions to the implementation issues identified.
7. Are there any alternative approaches to the division of labor that offer advantages over the proposed approach (Option C)? Please be as specific as possible about any alternative approaches and what advantages they have over the proposed approach.
8. Are there any potential drawbacks with the basic procedural steps and filing frequency outlined in Table 3? If so, please suggest an alternative approach and provide your rationale for why it is optimal.

For Questions 9 and 10, please also refer to Table C-1 in Appendix C.

9. Please provide recommendations for the IRP filing frequency, contract period, and process for submitting updates or modifications in the IRP-LTPP 2016-2017 proceeding. Where appropriate, distinguish between any near-term recommendations (i.e., for IRP 2017) and longer-term recommendations (i.e., for cycles beyond IRP 2017).
10. How should the administrative requirements for activities associated with Pub. Util. Code § 454.5 and the large IOU bundled procurement plans be treated in the IRP-LTPP 2016-2017 proceeding? In future cycles beyond IRP 2017?

3. Framework Component #3: CPUC's Guidance for Filers

A fundamental question for the CPUC's IRP framework is: What type of guidance should CPUC provide for each IRP element? One approach would be for the CPUC to allow broad latitude to filing entities for how to develop their IRPs. On the other end of the continuum, the CPUC could provide detailed specifications and protocols that determine exactly how the IRPs must be produced and what each IRP must include.

For the 2017 IRP cycle, staff propose an intermediate approach. The CPUC would develop a set of required features for each of the IRP process elements defined under Framework Component #1. For example, the required features of the IRP itself are listed in Table 4. The CPUC would also develop a set of more detailed standards that staff would use to evaluate whether each component is adequate. As an example, as shown in Table 4, the CPUC would require that the large IOUs submit the candidate portfolios that they evaluated during the IRP development process. The CPUC would further require that the data be presented in a particular, pre-specified format. However, as noted in the previous section, the CPUC would not necessarily specify the method that LSEs use to generate their portfolios, as each LSE would each be using the CPUC-generated multi-LSE portfolio as a common reference point. This approach is intended to strike a balance between allowing IOUs the flexibility to develop innovative solutions and providing some degree of standardization and transparency to facilitate timely and fair review by the CPUC and stakeholders—both while minimizing customer costs and meeting the state's other policy goals.

The amount of detail in the requirements and standards established by CPUC would vary by the type of element (activity, output, or input) and potentially by LSE. Proposed core requirements and relevant standards for each IRP element are summarized below to provide a general overview of the proposed approach. The next section provides more specific information on proposed requirements and types of standards for each element and element component. The information provided below is not yet detailed enough to serve as the final filing guidance, but provides an indication of the type of guidance that staff anticipates developing with input from stakeholders.

A. Activities

1. Required Elements

Staff propose that the large IOUs use and document processes that perform the following functions in generating IRP outputs: generate portfolios, demonstrate portfolio compliance, analyze portfolio impacts, and recommend a portfolio. Acknowledging the more limited resources of the non-large IOUs, staff propose that those entities be exempt from documenting their processes, except that CCAs must document whether they are self-supplying integration solutions (see Table 4). Energy Division staff must also document validation of system or local capacity and flexibility sufficiency.

2. Relevant Standards

Staff propose that the following standards be used by the CPUC to review IRP processes during the review process:

- **Modeling Standards**: guidance on general standards for modeling and on how specific required scenarios should be represented in modeling (this document would subsume a portion of the Assumptions and Scenarios document, and could also leverage work on production cost simulation modeling in 2014 LTPP proceeding).
- **Activity Documentation Standards:** required information for documenting the activities performed to develop the output elements
- **Integration Self-Supply Standards**: requirements for demonstrating that a CCA is self-supplying its own integration solutions

Table 4. Required Process Functions by LSE

<table>
<tr><th>LSE</th><th>Required Process Functions</th><th>Expected Timeframe*</th></tr>
<tr><td>Large IOUs</td><td>• Generate Portfolios
• Demonstrate Portfolio Compliance
• Analyze Portfolio Impacts
• Recommend Portfolio</td><td rowspan="5">Spring – Summer 2017, with IRP filings in Fall 2017</td></tr>
<tr><td>CCAs</td><td>• Demonstrate Self-Supply of Integration Solutions</td></tr>
<tr><td>ESPs</td><td rowspan="3">None</td></tr>
<tr><td>SMJUs</td></tr>
<tr><td>COOPs</td></tr>
<tr><td rowspan="2">CPUC</td><td>• Identify CPUC-Preferred Portfolio</td><td>Spring 2017</td></tr>
<tr><td>• Determine IRP Compliance, including validation of system or local capacity and flexibility sufficiency
• Authorize Procurement</td><td>Late 2017/Early 2018</td></tr>
</table>

*Timeframe based on schedule in R.16-02-007 Scoping Memo.

B. Outputs

1. Required Elements

Staff propose that large IOUs produce the following outputs as part of their individual IRPs: candidate portfolios, recommended portfolios, action plan, and procurement authorization request. The short form IRP to be submitted by non-large-IOU LSEs would include the recommended portfolio and action plan elements only. Table 5 summarizes the required IRP components by each LSE Type.

2. Relevant Standards

Staff propose the following categories of standards be used by the CPUC when reviewing IRP outputs during the review process:

- **Output Data Standards:** required tables, fields, data types, file formats, data quality, data sources

- **Policy and Scenario Standards:** minimum set of scenarios that should be included and metrics that should be evaluated (this document would subsume a portion of the Assumptions and Scenarios document[10])
- **Activity Documentation Standards**: required information for documenting the activities performed to develop the output elements

C. Inputs

1. Required Elements

Staff propose that the large IOUs use and document the following types of inputs: load forecast; inventory of supply and demand resources; transmission capability and upgrade costs; policy goals, planning targets, and limits; and other modeling assumptions. Staff propose that the other LSEs document the following types of inputs for use in their IRPs: load forecast; inventory of supply and demand resources; transmission capability and upgrade costs (see Table 5).

Table 5. Required Input Elements by LSE

LSE	Required Input Elements	Expected Timeframe*
Large IOUs	• Load forecast • Inventory of supply and demand resources • Transmission capability and upgrade costs • Policy goals, targets, and limits • Other modeling assumptions	Spring 2017
CCAs	• Load forecast • Inventory of supply and demand resources • Transmission capability and upgrade costs	
ESPs		
SMJUs		
CPUC	IRP requirements and standards	

*Timeframe based on schedule in R.16-02-007 Scoping Memo.

2. Relevant Standards

Staff propose that the following categories of standards be used by the CPUC when reviewing IRP inputs during the review process:

- **Input Data Standards:** required tables, fields, data types, file formats, data quality, data sources
- **Data Source Standards**: assumptions and guidance on how specific types of input data should be developed and documented

[10] The CPUC updates the Assumptions and Scenarios on an annual basis for use in the CAISO's Transmission Planning Process and in CPUC long-term procurement planning activities. The 2016 Assumptions and Scenarios were adopted by Commission Ruling in May 2016: www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=11673.

- **Policy and Scenario Standards**: guidance on minimum set of scenarios that should be included (this document would subsume a portion of the Assumptions and Scenarios document)
- **Modeling Standards:** guidance on general standards for modeling and on how specific required scenarios should be represented in modeling (this document would subsume a portion of the Assumptions and Scenarios document, and could also leverage work on production cost simulation modeling in 2014 LTPP proceeding).

Questions

11. Are there any categories or types of guidance for filing entities that are not addressed above, but should be? If so, explain why and include a reference to the relevant guiding principles for IRP process development.
12. Are any of the categories of guidance listed above inappropriate or problematic in light of the guiding principles for IRP process development?

4. Framework Component #4: CPUC Responsibilities for IRP

There are different ways that the CPUC could review IRPs submitted by LSEs, raising a fourth fundamental question for the CPUC's IRP framework: What are the actions that the CPUC will take in the 2017 cycle of the IRP process, and the IRP process going forward? Staff propose that the CPUC take responsibility for three activities and outputs: IRP review, preferred portfolio identification, and procurement authorization (including incremental for system or local capacity and flexibility sufficiency, if necessary).

A. Options for Managing the IRP Review Process

As described under the previous framework option, staff propose to rely on a set of required elements and element standards to guide its IRP review process. This approach is intended to strike a balance between allowing filing entities the flexibility to innovate and facilitating timely and transparent review.

There are several options for how the outcome of the IRP review process can be handled, both substantively and procedurally. Staff does not offer a proposal, but welcomes parties to offer their own, per the questions that follow.

Questions

13. What filing process would be appropriate for IRPs (e.g., advice letter, application)? Please refer to the procedural steps in Table 3 in your response. Please include as much detail as possible, including whether the process should be confidential or public, posted to a website or served on a proceeding, etc.
14. What consequences/incentives would be appropriate for submitting non-compliant/compliant IRPs? What criteria should be used?

B. Options for Identifying the CPUC-Preferred Portfolio

There are several options for identifying the multi-LSE optimized portfolio that best fits the requirements of Pub. Util. Code § 454.51. Staff have proposed that the CPUC generate a preferred portfolio for CPUC-regulated entities that informs individual LSE IRPs. Staff have also proposed working with parties to develop a transparent approach for developing the candidate portfolios that will be considered during the multi-LSE optimization process. This approach will be developed with the goal of providing information that informs investment decisions in the face of significant uncertainties. This approach will be developed within its own work track (see Figure 1), and is described in more detail in the section titled "Scenario Development and Portfolio Identification" below.

Questions

15. Are there any other options for the type of action, outcomes of action, or criteria for portfolio adoption that the Commission could take consistent with Pub. Util. Code § 454.51 that should be considered?
16. Do you agree with the proposed type of action and possible outcomes of action? Why or why not?
17. Should the Commission have standardized, public criteria for choosing which portfolio to adopt, or should it have the flexibility to apply whatever criteria are deemed appropriate at the time the decision is made? Why or why not?

C. Options for Interacting with Other Procurement Proceedings

There are many ways that the IRP process could interact with other Commission proceedings that result in resource procurement by regulated LSEs. Three possible options are described below.

1. Procurement authorization stays within the individual resource proceedings and not within the IRP process. This represents an approach in which the individual resource procurement programs largely continue on their current paths, with the preferred portfolio identified through the IRP process. This option could involve mandatory targets being passed from IRP to individual resource proceedings, or could entail the IRP proceeding setting illustrative, non-binding targets.

2. CPUC authorizes only incremental procurement that is justified by the IRP beyond that identified within individual resource proceedings.
3. CPUC consolidates all procurement authorization within the IRP process. This option represents an approach in which the primary target-setting for the acquisition of new resources is a product of a centralized and integrated analysis of all available resource options.

As noted previously, staff believes that Option C (the Hybrid Approach) may be the best approach for the long term, but a transition to this approach should be done at a pace that does not create disruptions in current procurement of resources. Therefore, staff propose that for the 2017 cycle of IRP filings, the Commission consider any requests for incremental procurement not otherwise authorized that emerge from the approved IRPs.[11] For example, if an IRP indicates a need for increased procurement of renewable resources beyond what has been authorized in the RPS proceeding, the Commission could authorize such procurement through IRP. Alternatively, if the IRP indicates (and CPUC confirms) that new resources are needed to provide sufficient system or local capacity or flexibility, the Commission could authorize such procurement through IRP as well. The proposed approach is intended to balance the need to meet any genuine need that is demonstrated in the preferred IRP portfolio with the considerable effort required to consolidate procurement authorization across proceedings. This approach toward procurement authorization may need to be revised in future cycles as new resource needs emerge and the IRP process necessarily evolves.

Questions

18. Are there any other options for how the IRP process should address procurement authorization?
19. Do you agree with the proposed phased approach to procurement authorization in the IRP process? Why or why not?

D. Other Procurement Authorization Options

Another set of options related to procurement authorization pertains to how closely filing entities should be required to match the portfolio that justified an approved IRP procurement authorization during actual procurement. During actual procurement, bids in a solicitation for resources may reveal that costs and resource supply are different from those assumed during IRP development. In such a case, it may be beneficial for filing entities to have some degree of flexibility to pursue procurement that is not perfectly aligned with the previously approved IRP. Below are two options for handling such a case.

1. CPUC requires LSEs to establish the reasonableness of any deviations from the approved IRP for each type of approved procurement in all subsequent cost recovery and allocation proceedings.

[11] Per the R.16-02-007 Scoping Memo, the IRP proceeding would need to be recategorized as ratesetting if it contemplates new procurement authorization with rate implications.

2. CPUC requires LSEs to establish the reasonableness of any deviations outside of an established margin of error for each type of approved procurement in all subsequent cost recovery and allocation proceedings.

A related consideration is the extent to which the CPUC-preferred portfolio identified through IRP sets a cost-effectiveness standard for resource acquisition across program and resource types. In other words, the assumed cost of a resource in the portfolio-generation process and/or the quantity included in the final portfolio could be used to define the expenditure limit for that resource. As an example, if the preferred IRP portfolio includes energy efficiency resources that exceed the currently authorized target and/or budget, the CPUC could potentially authorize additional spending on energy efficiency programs.

Questions

20. Are there any other options for how the IRP process should address deviations between actual procurement and approved IRPs? What is the preferred approach to handling these deviations? Please explain your answer.
21. Should the quantity or assumed cost of a particular resource type included in the CPUC-preferred portfolio define the amount of that resource that is cost-effective to procure? If so, should it be used to limit procurement below pre-established targets (such as 50% RPS) pursuant to statutory language that requires the CPUC to maintain low rates and avoid disproportionate rate impacts? Alternatively, should the IRP process have authority to raise procurement targets but not to lower them? Why or why not?

Key Issues for IRP Guidance: Scenarios, Modeling, GHG Planning Targets, and Process Alignment

Four key issues that must be addressed in CPUC's guidance for filing entities include:

1. **Process Alignment**: The coordination of IRP-related activities among the CPUC, California Energy Commission (CEC), CARB, and CAISO, and the coordination between IRP and other resource proceedings in the CPUC.
2. **Computing GHG Planning Targets**: The appropriate GHG planning target for the electric sector, and for individual LSEs.
3. **Scenario Development and Portfolio Identification**: The types of scenarios that should be represented among candidate portfolios included in an IRP and how scenarios results should be measured and evaluated.
4. **Modeling**: The types of models that are appropriate for use in IRP, and how they should be used.

As shown in Figure 1, staff anticipates that these issues will be explored in more detail via discrete work tracks that may include working groups, webinars, workshops, or other similar activities. Party feedback

collected through these work tracks will inform a final staff proposal to be released at the end of 2016. Each of these issues is described in more detail below.

1. Process Alignment

Similar to LTPP, the IRP process will depend on the continued collaboration of the CEC, CAISO, and CPUC per the CPUC-CEC-CAISO LTPP/TPP Process Alignment.[12] The multi-LSE portfolio will be prepared in close coordination with planning activities led by those agencies for one or more scenarios. Close coordination with the CEC will be needed during the IRP portfolio generation process in particular, as the CEC is responsible for overseeing the IRP filing process for 16 publicly-owned utilities,[13] which are outside the jurisdiction of the CPUC. The CPUC will also provide assumptions and scenarios to be used in the CAISO Transmission Planning Process, and related transmission approvals could impact the optimal resource mix in IRP portfolios. The CPUC, CEC, and CAISO will also collaborate with CARB, which is responsible for estimating multi-sector contributions to achieve the state's GHG emission reduction goal.

Process alignment will also need to occur within the CPUC itself, in particular regarding the pre-existing statutory requirements associated with particular resources (i.e., energy efficiency, storage, renewables, distributed generation, demand response, etc.). The relationship between specific resource procurement mandates (overseen in other proceedings that authorize procurement) and the inputs/outputs of the IRP portfolio optimization process will need to be clearly defined. There may be a need for a feedback mechanism through which other proceedings can inform and respond to the IRP proceeding, ensuring also that new utility business models are being considered. At the same time, there is potential for the IRP framework to reduce complexity and create procurement efficiencies by consolidating some resource procurement programs.

Questions

22. What changes are needed to existing internal and external process alignment activities to be responsive to the new statutory responsibilities required for the IRP process? Please be specific with any proposed change. Parties are encouraged to work coordinate on this question in particular.

2. Approach for Calculating and Implementing GHG Planning Targets

CPUC staff anticipates providing guidance to filing entities regarding the GHG planning targets that their filed plans must meet. These GHG planning targets will be used to determine, along with other factors, whether the plans filed with the CPUC are approved or not. The GHG planning targets may also be used as constraints in power system modeling work conducted by filing entities to develop their integrated resource plans. As noted in the previous section, the process for calculating GHG planning targets will

[12] http://cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6630

[13] The POU IRP requirement of SB 350 applies only to POUs with an annual electrical demand exceeding 700 GWh, as determined on a three-year average commencing January 1, 2013. A total of 16 POUs must adopt IRPs and an updating process by January 1, 2019.

require close collaboration among the CPUC, CEC, and CARB, to ensure that each agency is well-positioned to fulfill its statutory obligations for achieving the state's carbon reduction goals.

A distinction should be drawn between a GHG planning target and a GHG emissions cap. A planning target is used in planning activities such as IRP, to guide investment and procurement decisions. CPUC may accept or reject filed plans based on whether or not the plans demonstrate a plausible path to achieving GHG reduction targets. GHG emissions caps are binding requirements for actual emissions and are separate and distinct from the planning targets to be established in the IRP process.

CPUC staff are working closely with CARB staff on a number of GHG-related issues that are critical to developing the final guidance that CPUC will provide to filing entities. The issues that CPUC and CARB are exploring include, but are not limited to:

- Statewide methodology for 2030 GHG planning targets
    - Range of emissions for the entire California electric sector
    - Planning targets for the distribution utilities under CPUC jurisdiction, in aggregate
    - Planning targets for individual LSEs
- Statewide methodology for tracking and enforcing compliance with GHG planning targets
- Timing and process for updating sectoral 2030 GHG emissions ranges based on actual performance
- Role of other GHG-related programs and mandates in electric sector 2030 GHG planning targets and compliance requirements.
- Potential for calculating standard marginal GHG abatement costs for different measures that could be used in IRP.

Questions

23. How should LSE-specific GHG planning targets be used in CPUC's IRP process? What is an appropriate methodology for calculating LSE-specific GHG planning targets?

3. Scenario Development and Portfolio Identification

A key input for the IRP process is guidance on which scenarios to represent during IRP portfolio generation and how a preferred portfolio should be identified from among the candidate portfolios. Previous and ongoing work using the E3's PATHWAYS model by various state agencies, include CARB, is expected to inform the types of scenarios that are considered in IRP. Modeling results from PATHWAYS could inform IRP scenarios by providing specific electric sector carbon targets, or by providing illustrative types of futures that would be considered during the portfolio generation process.

SB 350 specifies a number of requirements for IRPs that are tied to specific policy goals. Many of these goals are already reflected in existing Pub. Util. Code and CPUC administrative requirements (refer to

Appendix A and B), and some are reflected in the design of the conceptual IRP framework described in previous sections (e.g., adopt a process for each LSE to file an IRP). However, other policy goals will need to be reflected in the IRP scenario development process. They include, but are not limited to, the following:

- **GHG emissions targets**: As established by CARB, toward statewide reductions of 40 percent from 1990 levels by 2030.
- **RPS**: 50 percent by 2030.
- **Rates**: Minimize impact on ratepayers' bills.
- **Reliability**: Ensure system and local reliability.
- **Disadvantaged communities**: Minimize localized air pollutants and other GHG emissions, with early priority on disadvantaged communities.
- **Local communities**: Strengthen the diversity, sustainability, and resilience of local communities.

In addition to IRP policy goals, there are many broader electricity market and regulatory issues that are expected to inform the scenario development and evaluation process. These issues are described in more detail in the next section. The approach to scenario development and the specific scenarios to be considered within the IRP process is anticipated to be addressed with participation from parties through working groups, workshops, or other formats in fall of 2016.

Historically, the scenarios to be modeled in the LTPP proceeding were specified in the Assumptions and Scenarios document. That practice may continue in the form of a 2017 Assumptions and Scenarios document, or the Assumptions and Scenarios document may be separated into two different documents, one covering standardized modeling assumptions, and the second covering the required scenarios for IRP along with the rationale for why those scenarios are required. The determination as to whether to split the Assumptions and Scenarios document or continue to develop a single document will depend on what is most effective and efficient for the overall IRP process. This issue will also be addressed through the working group on scenario development.

Questions

25. What types of future uncertainties should be included among the candidate portfolios generated in IRP 2017? Please provide a prioritized list of uncertainties that should be represented, along with an explanation for the priority level assigned to each uncertainty. Please indicate which uncertainties may be appropriate to represent together and which should be represented separately, and why. For example, it may be reasonable to represent the impact of multiple GHG-reduction activities that all increase electric sector load together to create a single "high load" future in order to represent the maximum load stress on the electric system.
26. What metrics should be used to track the results for each policy or program area? How should the metric be calculated?

4. Modeling in IRP

Significant effort on the part of both staff and parties in the predecessor to the current IRP proceeding was devoted to developing an approach to standardize production cost simulation performed for the purpose of assessing the need for new flexibility or capacity resources. The IRP process potentially includes a wider range of modeling activities than production cost simulation. For example, the core IRP activity of generating candidate portfolios for further evaluation may be better suited to a capacity expansion-type of model with a longer-term time-horizon (and potentially less operational detail) than the single year typically captured in production cost simulation models. Within IRP, production cost simulation modeling is probably still essential for validating that a portfolio includes sufficient capacity and flexibility. The different types of models that may be useful for different IRP activities are shown in Table 6.

It should also be noted that models are not always necessary for each IRP activity. For example, generating candidate portfolios could also be accomplished by hand-building them to represent a particular, hypothetical resource acquisition policy.

As with scenario development, the appropriate guidance for modeling to inform IRP will be developed with participation from parties through working groups, workshops, or other formats in fall of 2016. In the near term, the guidance for modeling to inform IRP is expected to draw upon the work initiated in the 2014 LTPP proceeding where appropriate, and may be included in the 2017 Assumption and Scenarios Document or may be separated from the scenario specifications as a stand-alone document. The determination as to whether to split the Assumptions and Scenarios document or continue to develop a single document will depend on what is most effective and efficient for the overall IRP process. In the longer term, CPUC staff may take a more active role in IRP modeling efforts, such as by modeling the combined LSE IRP filings to determine whether they meet reliability targets at least cost.[14]

[14] Separate from the IRP proceeding, CPUC Energy Division is currently building the capability to perform flexibility modeling and/or portfolio optimization analysis in-house. These efforts are in nascent stages and will involve close coordination with agencies and parties that conduct modeling.

Table 6. Types of Models that Could be Useful for Integrated Resource Planning.

IRP Activity	Type of Model	Type of Output	Example Models[2]
1. Develop Data (develop inputs and assumptions needed for subsequent IRP activities)	Various	Resource production profiles, resource locations, forecasted load, load shapes, sectoral GHG targets	PATHWAYS (for electric sector GHG planning target); System Advisor Model (for Solar PV Production profiles);
2. Generate Portfolios (generate mix of resources needed to serve load in future years)	Capacity Expansion	Selected supply and/or demand resources	Aurora, PLEXOS, RESOLVE, Resource Planning Model, Strategist, SWITCH, System Optimizer
	Custom	Selected RPS resources, investment cost	RPS Calculator, RPS Scenario Maker
3. Evaluate Portfolios (determine compliance with required standards and/or document performance according to certain metrics)	Production Cost Simulation	Operating Cost	GE-MAPS, Gridview, PLEXOS, PROMOD, SERVM, REFLEX
		Renewable Curtailment	
		GHG Emissions	
		Resource adequacy (reliability events)	
	Loss-of-Load-Probability	Resource adequacy (e.g., LOLP, LOLE, EUE)	GE-MARS, RECAP, SERVM
	Power Flow	Transmission constraints	CYME, PSLF, PSSE
	Custom	Impact on disadvantaged communities	Cal Enviro Screen
	Custom	Land use	

[1]Shaded area reflects type of modeling that was the focus of 2014 LTPP proceeding activity.

[2]Some models may have overlapping capabilities and therefore are mentioned more than once; not intended to represented a comprehensive list of all available models

Questions

27. Is the overall assignment of modeling types to IRP activities in Table 6 reasonable? Are there types of models that may be useful for IRP that are not represented?
28. What options are available for completing the multi-LSE optimization modeling and generating an optimal portfolio by April 2017, in keeping with the proceeding schedule?
29. What type and amount of modeling is realistic for LSEs to conduct in time to file by fall of 2017, assuming final guidance from CPUC is issued in April 2017?
30. How does answer to the above question vary depending on the scope of the load included in each portfolio (e.g., individual LSE vs. aggregate CAISO load)?

Potential Electricity Market and Regulatory Issues

Potential electricity market and regulatory issues to be addressed in the IRP-LTPP proceeding are listed in Table 7. The purpose of Table 7 is to organize distinct potential or emerging issues that may have significant market and/or regulatory impacts warranting special consideration in any given cycle of integrated resource planning. The IRP framework described in this staff paper will be designed to address some of these issues should they arise, and others may be better addressed through modeling guidance (including scenario analysis), an impact analysis, or similar. This table is not intended to capture the policy goals or statutory requirements put forth in SB 350, such as GHG planning targets or regulatory treatment of LSEs by type.

Table 7. Potential Electricity Market and Regulatory Issues for the IRP Proceeding

ID	Issue	Description and Potential Needs in the IRP Process	Identifying Source (Parties or CPUC Staff)
a	Pre-existing statutory requirements associated with particular resources (i.e., energy efficiency, storage, renewables, distributed generation, demand response, etc.)	The relationship between specific resource procurement mandates (overseen in other proceedings that authorize procurement) and the outputs of the IRP portfolio optimization process will need to be clearly defined. Some have expressed a need for a feedback mechanism through which other proceedings can inform and respond to the IRP proceeding, ensuring also that new utility business models are being considered. At the same time, there is potential for the IRP framework to reduce regulatory complexity and create procurement efficiencies by consolidating some resource procurement programs.	Party comments on the OIR (Alliance for Retail Energy Markets, Brookfield Renewable Energy Partners, CAISO, Environmental Defense Fund, Large Scale Solar Association, Office of Ratepayer Advocates, Pathfinder CAES , SCE) CPUC Staff
b	Long-lead-time resources (e.g., pumped hydroelectric storage and transmission beyond California borders)	In the last 10 years or more, resources needed for system and local capacity have been authorized for and procured by individual IOUs. Some parties have raised a need for the IRP process to more closely consider uniquely large capital investment for infrastructure projects that could provide energy and/or grid services that benefit the entire grid, i.e. beyond the need of any single LSE. A new process for determining how to buy expensive assets may or may not be needed.	Parties comments on the OIR (Brookfield Renewable Energy Partners, California Energy Storage Alliance, EDF Renewable Energy, Pathfinder CAES)
c	Cost sharing and/or cost allocation between multiple LSEs	Some parties have raised the issue that LSEs should pay their fair share for the benefits they receive from IRP procurements. Some have expressed a need for a new process to determine how to review cost-sharing mechanisms necessary for valuing benefits, and allocating benefits and costs, of a single resource across multiple LSEs.	Parties comments on the OIR (Brookfield Renewable Energy Partners, California Energy Storage Alliance, California Wind Energy Association, EDF Renewable Energy, PG&E, SCE)
d	Potential regionalization of the California Independent System Operator (CAISO)	SB 350 expressed the intent of the Legislature to provide for the evolution of the CAISO into a regional organization to promote the development of regional electricity transmission markets across the West. CAISO and PacifiCorp are currently exploring the feasibility, costs and benefits of full integration of PacifiCorp into the CAISO control area. Other balancing authorities are also considering joining the CAISO. There is potential for regionalization studies to	Party comments on the OIR (California Energy Storage Alliance, Environmental Defense Fund, Natural Resources Defense Council, The Utility Reform Network)

ID	Issue	Description and Potential Needs in the IRP Process	Identifying Source (Parties or CPUC Staff)
		inform the IRP proceeding, particularly in terms of GHG emissions accounting.	
e	Economic impact of IRP on existing assets	Some parties have stressed the importance of considering the availability, value, and viability of existing conventional generation resources. Resource retirements that are fairly certain, such as generators utilizing once-through-cooling, are included as assumptions in LTPP assessments of future capacity needs. Resource retirements that are uncertain, such as the retirements of generating units unsupported by long-term contracts and whose revenues decline due to market forces, are unaccounted for in LTPP assessments. CAISO doing a special study on the risk of retirement in the TPP, expected by end of 2016.	Party comments on the OIR (Calpine Corporation and Calpine PowerAmerica-CA, Cogentrix Energy Power Management, Inland Empire Energy Center, Wellhead Electric Company)
f	Uncertainties around transportation electrification	Electric transportation, as a fuel-switching and load-building measure, implicates emissions constraints across multiple sectors of the economy (electricity/transport) by reducing diesel and gasoline emissions and increasing electric power emissions. The technological capabilities of electric transportation may impact the IRP process given the fundamental impacts of the load (or generation) shape to generation and distribution capacity needs, since the means of grid integration can enable their use as a Distributed Energy Resource (DER).	Party comments on the OIR (Joint Solar Parties, Natural Resources Defense Council, Office of Ratepayer Advocates, SCE) CPUC Staff
g	Uncertainties around zero-emissions vehicle (ZEV) technology type	It is uncertain whether the next generation of ZEVs will be fuel cell-based, electric, or something else. This will have a significant impact on the load shape and required infrastructure investments. Actual penetration of ZEV is uncertain; high penetration will increase electric load, whereas low penetration will not. High volume of electric vehicles will imply significant additional storage potential, whereas high volume of hydrogen fuel cell vehicles will require electricity for generating hydrogen.	CPUC Staff
h	Uncertainties around energy supply for buildings	There is potential for the emergence of biogas to compete with natural gas, impacting demand for electricity and the need for additional pipelines in buildings.	Party comments on the OIR (Joint Solar Parties) CPUC Staff
i	Potential widespread adoption of DERs	Distributed energy resources (DERs, including rooftop solar, customer-side storage, and demand response) have become more widespread, raising questions over how to optimize energy resource solutions across a grid that operates at multiple levels—from the macro, centralized level (i.e., the CAISO) down to the micro, more decentralized level (DERs). Focusing on DERs and building generation close to load could provide a range of benefits to the customer and the grid; however, investments in DERs could also lead to system redundancy if not aligned with specific grid needs.	CPUC Staff
j	Requirements associated with planning for climate change adaptation and climate resilience	There may be a need for LSEs to address climate adaptation and climate resilience within their IRPs. These requirements may be discussed in terms of cost, risk, and safety.	Party comments on the OIR (Joint Solar Parties) CPUC Staff
k	The impact of procurement on disadvantaged communities in California	SB 350 requires LSE IRPs to minimize localized air pollutants and other GHG emissions, with early priority on disadvantaged communities. Some parties have indicated a need for CPUC to adopt a methodology for evaluating	Party comments on the OIR (Sierra Club) CPUC Staff

ID	Issue	Description and Potential Needs in the IRP Process	Identifying Source (Parties or CPUC Staff)
I	Utilization of outputs from other resource specific proceedings of the Commission	There is potential for IRP to utilize the outputs from other CPUC proceedings, such as least-cost best-fit reform in the context of RPS implementation, common cost-effectiveness metrics from the integrated distributed energy resources proceeding, EE and DR resource "potential" analyses, etc.	Party comments on the OIR (California Energy Storage Alliance, CalWEA, Center for Energy Efficiency and Renewable Technologies, Environmental Defense Fund, Center ORA, PG&E)

Note: This table is not intended to provide an exhaustive list of issues raised by parties in the OIR comments.

Questions:

31. Do you agree with how the electricity market and regulatory issues are characterized? If not, explain why, and suggest new or modified language to describe the issue.
32. Are there any significant electricity market and regulatory issues that could impact IRP implementation that should be added to this table? Similarly, should any of the identified issues be removed from consideration?
33. For each of the identified issues:
    a. Indicate the priority on a scale of 1 to 3, with 1 being the highest priority
    b. Identify critical path items and associated dependencies that need to be addressed.
34. Identify the top six issues in the final list.

Appendix A: SB 350 and Integrated Resource Planning

Section 454.51

The commission shall do all of the following:

(a) 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. The portfolio shall rely upon zero carbon-emitting resources to the maximum extent reasonable and be designed to achieve any statewide greenhouse gas emissions limit established pursuant to the California Global Warming Solutions Act of 2006 (Division 25.5 (commencing with Section 38500) of the Health and Safety Code) or any successor legislation.

(b) Direct each electrical corporation to include, as part of its proposed procurement plan, a strategy for procuring best-fit and least-cost resources to satisfy the portfolio needs identified by the commission pursuant to subdivision (a).

(c) Ensure that the net costs of any incremental renewable energy integration resources procured by an electrical corporation to satisfy the need identified in subdivision (a) are allocated on a fully nonbypassable basis consistent with the treatment of costs identified in paragraph (2) of subdivision (c) of Section 365.1.

(d) Permit community choice aggregators to submit proposals for satisfying their portion of the renewable integration need identified in subdivision (a). If the commission finds this need is best met through long-term procurement commitments for resources, community choice aggregators shall also be required to make long-term commitments for resources. The commission shall approve proposals pursuant to this subdivision if it finds all of the following:

    (1) The resources proposed by a community choice aggregator will provide equivalent integration of renewable energy.

    (2) The resources proposed by a community choice aggregator will promote the efficient achievement of state energy policy objectives, including reductions in greenhouse gas emissions.

    (3) Bundled customers of an electrical corporation will be indifferent from the approval of the community choice aggregator proposals.

    (4) All costs resulting from nonperformance will be borne by the electrical corporation or community choice aggregator responsible for them.

Section 454.52

(a)

(1) Commencing in 2017, and to be updated regularly thereafter, the commission shall adopt a process for each load-serving entity, as defined in Section 380, to file an integrated resource plan, and a schedule for periodic updates to the plan, to ensure that load-serving entities do the following:

    (A) Meet the greenhouse gas emissions reduction targets established by the State Air Resources Board, in coordination with the commission and the Energy Commission, for the electricity sector and each load-serving entity that reflect the electricity

sector's percentage in achieving the economy-wide greenhouse gas emissions reductions of 40 percent from 1990 levels by 2030.

(B) Procure at least 50 percent eligible renewable energy resources by December 31, 2030, consistent with Article 16 (commencing with Section 399.11) of Chapter 2.3.

(C) Enable each electrical corporation to fulfill its obligation to serve its customers at just and reasonable rates.

(D) Minimize impacts on ratepayers' bills.

(E) Ensure system and local reliability.

(F) Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities.

(G) Enhance distribution systems and demand-side energy management.

(H) Minimize localized air pollutants and other greenhouse gas emissions, with early priority on disadvantaged communities identified pursuant to Section 39711 of the Health and Safety Code.

(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.

(b)

(1) Each load-serving entity shall prepare and file an integrated resource plan consistent with paragraph (2) of subdivision (a) on a time schedule directed by the commission and subject to commission review.

(2) Each electrical corporation's plan shall follow the provisions of Section 454.5.

(3) The plan of a community choice aggregator shall be submitted to its governing board for approval and provided to the commission for certification, consistent with paragraph (5) of subdivision (a) of Section 366.2, and shall achieve the following:

(A) Economic, reliability, environmental, security, and other benefits and performance characteristics that are consistent with the goals set forth in paragraph (1) of subdivision (a).

(B) A diversified procurement portfolio consisting of both short-term and long-term electricity and electricity-related and demand reduction products.

(C) The resource adequacy requirements established pursuant to Section 380.

(4) The plan of an electric service provider shall achieve the goals set forth in paragraph (1) of subdivision (a) through a diversified portfolio consisting of both short-term and long-term electricity, electricity-related, and demand reduction products.

(c) To the extent that additional procurement is authorized for the electrical corporation in the integrated resource plan or the procurement process authorized pursuant to Section 454.5, the commission shall ensure that the costs are allocated in a fair and equitable manner to all customers consistent with 454.51, that there is no cost-shifting among customers of load-serving entities, and that community choice aggregators may self-provide renewable integration resources consistent with Section 454.51.

(d) In order 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.

Appendix B: Statutory and Administrative Requirements

The language of SB 350 contains several major policy themes that will be covered in the IRP process, many of which are already affected by existing Pub. Util. Code and CPUC administrative requirements. Table B-1 organizes those laws and requirements by theme, summarizes the associated policy goals, and indicates the location of that theme in the IRP framework.

Table B-1. Statutory Requirements and Associated Policy Themes and Goals

Theme	Existing Policy and Regulatory Landscape		Goal	Place in Framework
Additional procurement	Public Utilities Code	1. 454.5	1. Rules for procurement plans (Commission approves plans before implementation)	Component #4: CPUC Responsibilities for IRP
		2. 454.5(c)	2. Additional procurement costs must be allocated in a fair and equitable manner	
		3. 454.51(b)	3. Best-fit and least-cost resources must be procured to satisfy portfolio needs	
		4. 454.52(a)(2)(A)	4. Commission may authorize all source procurement	
		5. 454.52(a)(2)(B)	5. Commission may approve resources that reduce GHG emissions but may not be price competitive	
	CPUC Proceedings	1. R.16-02-007	1. LTPP biennially evaluates need for additional generation and demand side resources	
Air pollutants	Public Utilities Code	1. 399.11(b)(3)	1. Reduce air pollution	Component #3: CPUC Guidance for Filers (Policy goal input)
		2. 400	2. Advance pollution reduction objectives	
		3. 454.52(a)(1)(H)	3. Minimize localized air pollutants and other GHG emissions	
		4. 701.1(c)	4. Assign value to air quality	
		5. 8350	5. Air pollution performance standard for new generation	
Costs	Public Utilities Code	1. 365.1(c)(2)	1. Rules for allocating net capacity costs of newly authorized generation	Component #3: CPUC Guidance for Filers (Inputs: Resource attribute and transmission capability; Activity: selecting portfolio)
		2. 400(b)	2. Take into account opportunities to decrease costs	
		3. 454.51(a)	3. Integration of renewables must be cost-effective	
		4. 454.51(b)	4. Portfolio needs must be satisfied by least-cost (& best fit) resources	
		5. 454.51(c)	5. Allocate costs of additional renewables on a fully nonbypassable basis	
		6. 454.52(c)	6. Costs of additional procurement must be allocated in a fair and equitable manner to all customers	
		7. 454.52(d)	7. No cost-shifting among LSE customers	
		8. 701.1(c)	8. Include costs and benefits to environment when calculating resource cost-effectiveness	
Disadvantaged communities	Public Utilities Code	1. 399.13(a)(7)	1. Give preference to renewable energy projects that provide environmental and economic benefits to disadvantaged communities	Component #3: CPUC Guidance for Filers (Policy goal input)
		2. 400(g)	2. Established a disadvantaged community advisory group	
		3. 454.52(a)(1)(H)	3. Early priority to minimize localized air pollutants in disadvantaged communities	
	Health & Safety Code	1. Section 39711	1. Defines how to identify a disadvantaged community	
	CPUC Proceedings	1. A.14-11-007	1. CARE (California Alternate Rates for Energy) budgets	
		2. A.15-02-001	2. Low income programs and budgets	
Elimination of redundancies	Public Utilities Code	1. 454.52(b)(4)(d)	1. Incorporate IRP process with any other planning processes of the commission	Component #4: Responsibilities for IRP (IRP full:

				consolidate procurement authorization across proceedings)
GHG emissions targets	Public Utilities Code	1. 399.13(a)(4)(A)(vi)	1. Consideration of statewide greenhouse gas emissions limit in process for selecting LCBF renewable energy resources	Component #3: CPUC Guidance for Filers (Policy goal input)
		2. 454.51(a)	2. Portfolio of resources designed to achieve GHG targets	
		3. 452.52(a)(1)(A)	3. LSEs must meet ARB GHG reduction targets	
	Executive Order	1. B-30-15	1. 40% reduction below 1990 level by 2030	
	CPUC Proceedings	1. R.11-03-012	1. Addresses utility cost and revenue issues associated with GHG emissions	
Local communities	Public Utilities Code	1. 454.52(a)(1)(F)	1. Strengthen diversity, sustainability, and resilience of local communities	Component #3: CPUC Guidance for Filers (Policy goal input)
Reliability	Public Utilities Code	1. 454.51(a)	1. Ensure a reliable electricity supply	Reliability requirement will be demonstrated in one of the activities to be developed
		2. 454.52(a)(1)(E)	2. Ensure system and local reliability	
	CPUC Proceedings	1. R.14-10-010	1. Resource Adequacy: Ensures safe and reliable operation of grid in real time	
		2. R.16-02-007	2. Considers electric procurement policies and programs to ensure a reliable electricity supply	
	Reliability Indices	1. System Average Interruption Frequency Index (SAIFI)	1. Average number of sustained interruptions per consumer during the year	
		2. System Average Interruption Duration Index (SAIDI)	2. Average duration of an interruption per consumer during a given time period	
		3. Momentary Average Interruption Frequency Index (MAIFI)	3. Average number of momentary (less than 5 minutes) interruptions per consumer during a given time period	
Resource diversity/balance	Public Utilities Code	1. 399.16	1. To achieve a balanced portfolio certain renewable energy resources within the WECC are eligible for RPS program compliance	Component #3: CPUC Guidance for Filers (Output: recommended portfolio; Activity: selecting portfolio)
		2. 454.51(a)	2. Portfolio of resources identified as needed must be diverse and balanced	
		3. 454.52(b)(3)(B)	3. Procurement portfolio needs to consist of short-term and long-term electricity and electricity-related and demand reduction products	
		4. 701.1(a)(1)	4. Encourage the diversity of supply-side and demand-side energy sources	
RPS	Public Utilities Code	1. 399.11-399.32 (Article 16)	1. CA RPS Program	Component #3: CPUC Guidance for Filers (Policy goal input)
		2. 454.51(a)	2. Optimal integration of renewable energy to electricity supply	
		3. 454.52(a)(1)(B)	3. Procure at least 50% eligible renewable energy by 2030	

	CPUC Proceedings	1. R.15-02-020	1. RPS Program: annually authorizes contracts for output of renewable energy generators		
Treatment of LSEs by type	Public Utilities Code	1. 454.52	IOUs[1]	1. Must file an integrated resource plan following certain provisions and procure best-fit least-cost resources to satisfy portfolio needs	Component #2: Division of Labor (IOU IRPs)
		1. 454.51(d)	CCAs[2]	1. CCA's submit proposals for satisfying their portion of renewable integration need; requirements for approval of CCA proposals	Component #2: Division of Labor (Provide inputs and short-form IRP)
		2. 454.52(b)(3)		2. CCA integrated resource plans must be submitted to governing board for approval and Commission for certification	
		1. 454.52(b)(4)	ESPs[3]	1. Must create a diversified portfolio of short-term and long-term electricity, electricity-related, and demand reduction products	Overarching framework question
		1. 454.52	Co-ops[4]	1. Must file an integrated resource plan following certain provisions and procure best-fit least-cost resources to satisfy portfolio needs	
		1. 454.52	SMJUs[5]	1. Must file an integrated resource plan following certain provisions	
		1. Section 9621	POUs[6]	1. Must adopt an integrated resource plan by its governing board by Jan 1, 2019	

[1] PG&E, SCE, SDG&E

[2] CleanPowerSF; Lancaster Choice Energy; Marin Clean Energy; Sonoma Clean Power

[3] 3 Phases Renewables, LLC; Agera Energy, LLC; Calpine PowerAmerica-CA, LLC; Commerce Energy, Inc.; Commercial Energy of California; Constellation NewEnergy, Inc.; Direct Energy Business; Direct Energy Services, LLC; EDF Industrial Power Services (CA), LLC; EnerCal USA, LLC; YEP Energy Gexa Energy California, LLC; Glacial Energy of California, Inc.' Liberty Power Delaware, LLC; Liberty Power Holdings, LLC; Mansfield Power and Gas, LLC; Noble Americas Energy Solutions LLC; Palmco Power CA; Pilot Power Group, Inc.; Praxair Plainfield, Inc.; Shell Energy; Southern California Telephone & Energy; Tenaska California Energy Marketing, LLC; Tenaska Power Services Co.; The Regents of the University of California; Tiger Natural Gas, Inc.

[4] Anza Electric Cooperative Inc.; Plumas-Sierra Electrical Cooperative; Surprise Valley Electrical Corp.; Valley Electric Association, Inc.

[5] Bear Valley Electric Service; Liberty Utilities; PacifiCorp

[6] Alameda Municipal Power, City of Anaheim, Azusa Light & Water, City of Banning, Biggs Municipal Utilities, Burbank Water and Power, City of Cerritos, Colton Public Utilities, City of Corona, Eastside Power Authority, Glendale Water and Power, Gridley Electric Utility, City of Healdsburg, Hercules Municipal Utility, Imperial Irrigation District, City of Industry, Lassen Municipal Utility District, Lodi Electric Utility, City of Lompoc, Los Angeles Department of Water & Power, Merced Irrigation District, Modesto Irrigation District, Moreno Valley Electric Utility, City of Needles, City of Palo Alto, Pasadena Water and Power, City of Pittsburg, Plumas-Sierra Rural Electric Cooperative, Port of Oakland, Port of Stockton, Power and Water Resources Pooling Authority, Rancho Cucamonga Municipal Utility, Redding Electric Utility, City of Riverside, Roseville Electric, Sacramento Municipal Utility District, San Francisco Public Utilities Commission, City of Shasta Lake, Shelter Cove Resort Improvement District, Silicon Valley Power, Trinity Power Utilities District, Truckee Donner Public Utilities District, Turlock Irrigation District, City of Ukiah, City of Vernon, Victorville Municipal Utilities Services

Appendix C: IRP and the Long-Term Procurement Plan Proceeding

The Long-Term Procurement Planning (LTPP) proceeding has traditionally functioned as an umbrella proceeding where the CPUC evaluates the need for additional generation and demand-side resources to maintain reliability on a system-wide basis and in transmission-constrained areas. Every two years the CPUC assesses the system and local resource needs of customers served by California's three largest investor owned electric utilities—SCE, PG&E, and SDG&E—over a ten-year horizon. Through the LTPP proceeding, the CPUC also determines what changes should be made to current procurement rules and examines the utilities' proposed procurement plans.

As indicated in the Scoping Memo, the IRP-LTPP proceeding (R.16-02-007) will function similarly to previous LTPP proceedings with the following issues remaining within scope:

- Procurement oversight and rules;
- Long-term system, flexible, and local reliability needs;
- Activities associated with Pub. Util. Code § 454.5 and the large IOU bundled procurement plans; and
- Any other issues that materially impact procurement policies, practices and/or procedures, and relate to one or more of the IRP-LTPP proceeding's goals or identified issues.

Table C-1 compares the primary activities and administrative requirements of the LTPP 2014-15 proceeding with those that exist or will need to be created for the IRP-LTPP 2016-17 proceeding.

Table C-1. Comparison of Activities/Requirements for LTPP 2014-15 and IRP-LTPP 2016-17 Proceedings

Track/phase	Item	LTPP 2014-2015 (R.13-12-010)	IRP-LTPP 2016-2017 (R.16-02-007)
Long-term reliability needs assessment	Regulated entities	Large IOUs, ESPs, CCAs	All LSEs (large IOUs, CCAs, ESPs, SMJUs, co-ops)
	Administrative process and requirements	Contract period: Long-term (> 5 years) Filing frequency: Every two years. In the first year, receive filings on the need for physical new reliability resources. If need is identified, in the second year, receive filings on the mix of resources best able to meet the identified need. Approval mechanism: Long-term contracts must be approved through the application process (although RFOs are the preferred mechanism for determining a procurement process was reasonable) Contents: IOU's preferred portfolio choice and other alternatives; relevant forecasts (fuel price, IEPR load); generation and transmission plans; and LTPP-defined scenarios Updates or modifications: Tier 3 Advice Letter	CPUC will develop rules and filing requirements for the IRP process (incl. schedule, format, planning framework, modeling direction, etc.), with consideration of statutory requirements, policy issues, regulatory differences by LSE type, etc. Contract period: TBD Filing frequency: TBD Approval mechanism: Refer to IRP framework described in this paper Contents: Refer to IRP framework described in this paper Updates or modifications: TBD LSEs will prepare IRPs for review and approval by the Commission (CCAs submit IRPs to Commission for "certification")
	Needs analysis	Evaluation of physical resource needs to ensure reliability in different scenarios. Assumptions and scenarios are developed early in the needs analysis and adopted by ACR after party comment. Trajectory assumptions are based on the continuation of current program direction. Parties assess long-term system and local resource needs by using certain amounts of resource requirements (such as RPS, energy efficiency, demand response, energy storage, etc.) as fixed input assumptions and determining residual need	Technical analysis leads to an optimized portfolio of resources to serve an LSE's load and under given policy requirements
	Procurement authorization	If a need is identified, the Commission issues decisions authorizing procurement by IOUs with cost shared by all benefiting LSEs	If a need is identified, the Commission issues decisions authorizing procurement of resources; CCAs have opportunity to self-supply
Procurement rules & bundled procurement plans	Regulated entities	Large IOUs[15]	Unchanged from LTPP 2014-2015
	Rules	CPUC establishes "upfront and achievable standards" for the IOUs' procurement activities and cost recovery; CPUC establishes new rules prior to the next filings of procurement plans	Unchanged from LTPP 2014-2015
	Administrative requirements	Contract period: Medium-term (< 5 years, > 3 months) Filing frequency: Approx. every two years Approval mechanism: Draft LTPPs are filed in the proceeding, draft plans are approved or	TBD

[15] According to Pub. Util. Code § 454.5(i), an electrical corporation that serves fewer than 500,000 electric retail customers within the state may file with the commission a request for exemption from Section 454.5.

		approved pending revision as described in the order. Revised plans are filed by advice letter. Contents: Rules and procedures for procuring resources, hedging plans, plan for meeting forecast customer needs based on standard assumptions Updates or modifications: Tier 3 Advice Letter	
	Bundled procurement plan filings	IOUs prepare procurement plans for review and approval by the Commission; plan ensures that all costs will be fully recoverable	TBD