GRIDWORKS

Final Evaluation of the California Public Utilities Commission Integrated Resource Planning Process

September 28, 2020

Table of Contents

Introduction 2

Background 2

Overview of Evaluation Method 5

Findings 7

- The IRP Cycle Could Remain at Two Years with a Modified Scope 7
- Stakeholders Question the Impact of Their Participation in the Proceeding 9
- Parties are Concerned IRP is Not Meeting Legislative Objectives 10
- The IRP Proceeding Procurement Track Must Be Clearly Defined 13
- Greater Inter-agency Coordination is Needed 14

IRP Process Recommendations 14

- Initiate an Inclusive Stakeholder Process to Improve the IRP Scope and Stakeholder Engagement 14
- Consider Alternatives for Accomplishing the IRP process in Two Years 15
- Delegate Development and Vetting of Modeling Inputs and Assumptions 16
- Enrich Regular Modeling Efforts with Supplemental Scenario Analysis, Conducted on an As Needed Basis 16
- Determine the Ultimate Role of the IRP Procurement Track and Clarify the Respective Roles of the IRP and the Resource Adequacy Proceedings in Ensuring System and Local Reliability 17
- Form Multiple Stakeholder Working Groups to Address Priority Issues 18
- Hold Multiple En Banc Hearings or All-Party Meetings throughout the IRP Process 19
- Require LSEs to Provide Information on Procurement Status and Publish Non-Confidential Data 19
- Reconvene Coordination Meetings Among Principals at the Commission, CEC, CAISO, and CARB 20

Conclusion 20

Introduction

The California Public Utilities Code requires the California Public Utilities Commission (Commission) to "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."[1] To meet this need, among others, the Commission leads a planning process which guides Load Serving Entities (LSEs) in developing Integrated Resource Plans. This process is referred to as Integrated Resource Planning (IRP) and is administered by the Commission through Rulemakings (R.) 16-02-007 and its successor 20-05-003.

This evaluation was conceived by the Commission to evaluate its IRP process. The purpose of the evaluation is to inform Commission decision-making about how the IRP process could better achieve its goals. The evaluation aims to provide the Commission with perspective on the following questions:

- How does the current IRP process relate to goals adopted in Senate Bill 350 and, subsequently, Public Utilities Code Sections 454.51 and 454.52?
- What was/is the IRP stakeholder engagement process?
- What challenges have occurred in the IRP process to date?
- How can the Commission set a course to make continuous improvements to the IRP process over time?

The primary audience for this evaluation is the Commission, but the evaluation is also addressed to the parties in the Commission's IRP proceeding. Thus, the evaluation aims to acknowledge openly party concerns, priorities, and suggestions and to initiate an inclusive, transparent effort to improve.

Based on its review of the goals of the IRP process, major IRP decisions made by the Commission, interviews with stakeholders and a survey of participating parties, Gridworks concludes the Commission has made significant progress in establishing and implementing a new and complex long-term planning process but significant challenges remain to improve process efficiency and effectiveness. Concrete steps could be taken immediately to begin those improvements. These conclusions and corresponding recommendations are laid out in four sections which follow: Background, Overview of Evaluation Method, Findings, and Recommendations.

Background

Prior to IRP, long-term electric planning was governed by the Long-Term Procurement Planning (LTPP) proceeding, which the Commission initiated after the Electricity Crisis of 2000-2001 to help ensure future system reliability at least cost. The LTPP was fundamentally different from IRP in a variety of important ways. The LTPP applied only to the three major IOUs, which each prepared its own long-term plan to submit to the Commission for review in a single consolidated proceeding. At the end of the process the

[1] Public Utilities Code Section 454.51.

Commission directed each of the IOUs to conduct any procurement of new resources needed to maintain reliable service in the future (system-wide or in a local area), and the net costs of such reliability resources were allocated to customers of all LSEs through the Cost Allocation Mechanism (CAM). Greenhouse gas (GHG) emissions were considered as part of the plan evaluations, but were not a direct and binding constraint as they are today.

Legislative Requirements for Integrated Resource Planning

In 2015, through the enactment of Senate Bill 350 (DeLeon), the Legislature added Sections 454.51 and 454.52 to the Public Utilities Code to incorporate new mandates related to integrated resource planning. The Code prescribes that the Commission will "**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**," leveraging a best-fit and least-cost procurement framework.[2]

To realize this overall objective, the Code directs the Commission to adopt a process for each LSE to file an integrated resource plan, and ensure that the LSEs do the following:

A. Meet California's GHG reduction targets;

B. Procure at least 60% eligible renewable energy resources by December 31, 2030;

C. Enable electric corporations to fulfill the obligation to serve;

D. Minimize ratepayers' bill impacts;

E. Ensure system and local reliability;

F. Leverage short- and long-term contracts to meet the renewable portfolio standard;

G. Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities;

H. Enhance distribution systems and demand-side energy management; and

I. Minimize localized air pollutants and other GHG emissions, with early priority on disadvantaged communities.[3]

For the purposes of this evaluation, Gridworks organized the language from Public Utilities Code Sections 454.51 and 454.52 into six high-level "IRP Goals:"

[2] Public Utilities Code Section 454.51.

[3] Public Utilities Code Section 454.52(a)(1)(A-I).

1. Reduce GHG and localized air pollutants consistent with legislative targets;
2. Ensure reliability of the electric system;
3. Ensure customers have access to electricity at least cost;
4. Procure a diverse set of supply- and demand-side resources;
5. Strengthen local communities, with particular focus on disadvantaged communities;[4] and
6. Coordinate electricity and GHG planning inputs and assumptions with the California Energy Commission (CEC), California Air Resources Board (CARB), and California Independent System Operator (CAISO).

Procedural Context for the IRP Cycle

In February 2018, in Rulemaking (R.) 16-02-007, the Commission approved the current IRP process as a two-year planning cycle, and designated the 2017-18 period as a "proof of concept" phase for the new process.[5]

- In the first year, Commission staff conducts modeling and analysis to develop a Reference System Plan, which represents a portfolio of new resources that collectively meet policy goals. By the end of the first year, the Commission adopts a Reference System Plan based upon staff's recommendations and stakeholder input on the proceeding record.
- In the second year, LSEs use the Commission-adopted Reference System Plan to develop individual integrated resource plans that reflect the unique electrical needs of their customers. Commission staff is responsible for aggregating the LSEs' individual plans to conduct a reliability assessment and recommend a comprehensive Preferred System Plan.

Since adopting the IRP structure, the Commission has administered one "full-cycle" of IRP for 2017-18 and is about halfway through the process for the 2019-20 planning cycle (i.e., the Reference System Plan for 2019-20 was adopted in March 2020).

[4] Ordering Paragraph 6 of Decision 18-02-018 states: For the purposes of integrated resource planning, a disadvantaged community shall be defined as any community statewide scoring in the top 25 percent statewide or in one of the 22 census tracts within the top five percent of communities with the highest pollution burden that do not have an overall score, using the most recent version of the California Environmental Protection Agency's CalEnviroScreen tool.

[5] Decision 18-02-18, *Decision Setting Requirements for Load Serving Entities Filing Integrated Resource Plans,* issued February 8, 2019, http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M209/K771/209771632.PDF.

On May 14, 2020, the Commission opened a new proceeding (R.20-05-003) as a successor to R.16-02-007. The proceeding will "address ongoing oversight of the IRP process and the procurement necessary to achieve the goals set by the Legislature in SB [Senate Bill] 350 and SB 100, as well as by the Commission in R.16-02-007."[6]

Finally, by way of background on this evaluation, in February 2019 the Commission solicited competitive bids for a contract to assist Commission staff in implementing and improving the IRP process.[7] Deliverable 10E under the solicitation envisioned this evaluation. Energy and Environmental Economics (E3), a California corporation, bid on and won the contract. Gridworks serves as a subcontractor to E3 working independently under the supervision of the Commission's Energy Division.

Overview of Evaluation Method

Decision Review

This evaluation began with a comparison of Commission decisions and Legislative objectives. Gridworks focused on the four major decisions issued as of March 2020:

- D.18-02-018, Adopting the 2017-18 Reference System Plan;
- D.19-04-040, Adopting the 2017-18 Preferred System Plan and initiating a procurement track in the proceeding;
- D.19-11-016, Ordering 3,300 MW of procurement for 2021-23 reliability needs; and
- D.20-03-028, Adopting the 2019-20 Reference System Plan.

On April 6, 2020, Gridworks delivered a memo summarizing findings from the Decision Review, attached as Appendix 1 to this report. The Decision Review shaped the scope of issues that Gridworks would continue to explore via stakeholder interviews and a survey, described below.

Stakeholder Interviews

Following the Decision Review, Gridworks interviewed key stakeholders representing 17 parties active in the IRP proceeding. Parties interviewed included investor-owned utilities, community choice aggregators, environmental advocates, an independent system operator, trade associations, and project and

[6] Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes, issued May 14, 2020, https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M337/K641/337641522.PDF.
[7] Solicitation materials available at https://caleprocure.ca.gov/event/8660/0000011879.

infrastructure developers. The interviews provided greater context to Commission decisions, and supported Gridworks' understanding of stakeholders' priority issues in IRP.

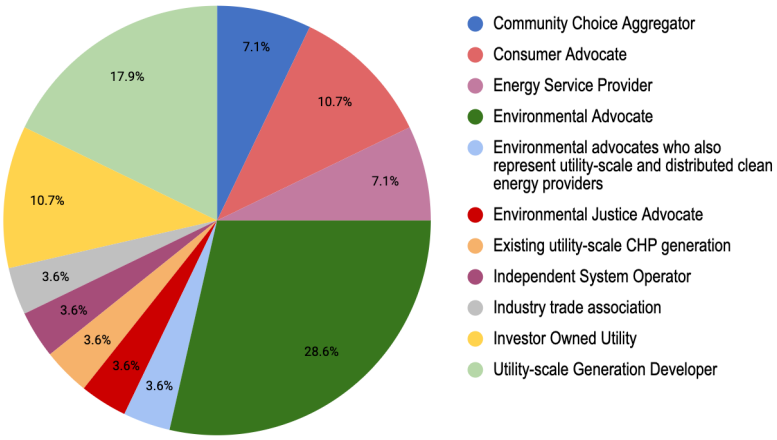
On June 5, 2020, Gridworks briefed Energy Division staff on the findings from stakeholder interviews. The presentation provided to the Energy Division is attached as Appendix 2 to this report.

Stakeholder Survey

To test the feedback heard in interviews, Gridworks issued a survey to parties in the IRP proceeding. In total, the survey was sent to approximately 190 individuals, with the request to limit responses to one per party. Twenty-nine (29) parties responded to the survey within the two-week response period. Survey respondents represented a broad range of stakeholders with ample experience in long-term resource planning at the Commission (Figures 1 and 2).

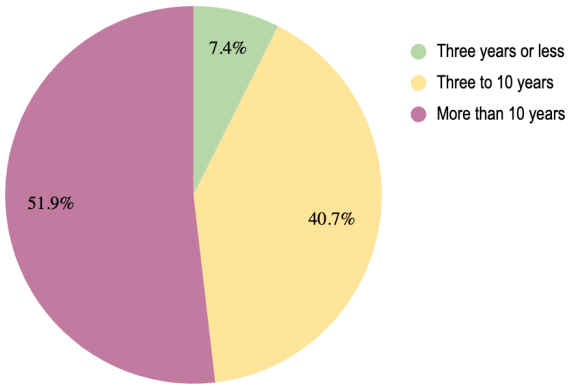
On July 13, 2020, Gridworks delivered a memo to Energy Division staff summarizing the stakeholder interviews and survey results, attached as Appendix 3 to this report.[8] The salient parts of Appendices 2 and 3 make up the Finding and Recommendations of this report.

Figure 1. IRP Evaluation Survey Respondents



[8] Please note that the July 13 memo inadvertently included a minor data processing error for Question 9, which asked stakeholders to identify up to four IRP priorities. This error is corrected in the attached version. The primary difference is that guidance to LSEs on large or long lead time resources was deprioritized compared to coordination with CAISO and ensuring planned resources are procured.

Figure 2. Survey Respondents' Experience in Long-term Resource Planning Processes (i.e., LTPP, IRP) at the CPUC



Limitation of Evaluation Scope

The findings of this evaluation are drawn directly from stakeholder input provided through the interviews and surveys conducted between April and June 2020, as described above. On August 14 and 15, 2020, California experienced power resource shortages which contributed to electricity outages and customer service disruptions. These events may have impacted stakeholder perspectives on the IRP process and priorities, but those impacts are not accounted for here because the events of August 2020 came after Gridworks concluded stakeholder engagement. This represents a limitation of the evaluation scope.

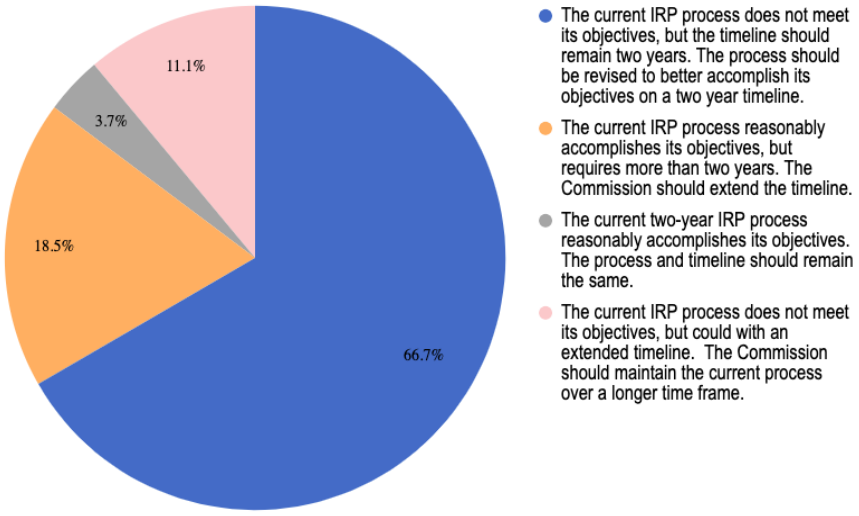
Findings

The findings reported here are direct results of stakeholder interviews and survey responses. Any Gridworks perspective or interpretation is explicitly labeled as such.

A. The IRP Cycle Could Remain at Two Years with a Modified Scope

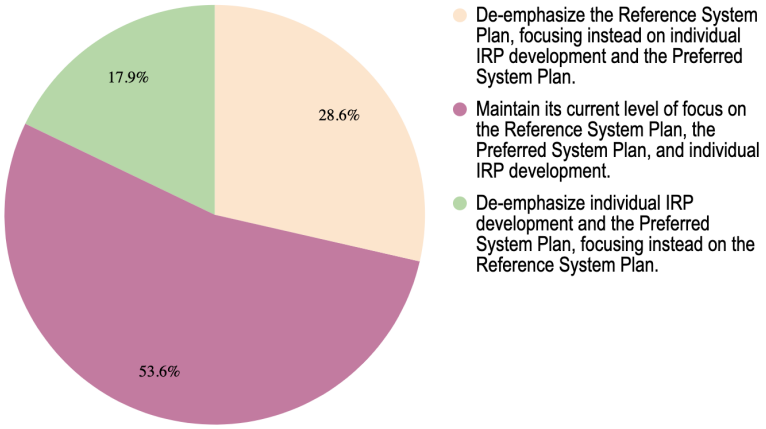
With regard to the timing and scope of the IRP cycle, most stakeholders noted that two years remains the appropriate cycle length; however, stakeholders suggest the scope of the IRP process should be adapted to better fit within that time frame.

Figure 3: Survey Responses on IRP Process Timing



At the same time, survey responses also indicated that the current focus points within the IRP scope, specifically the Reference System Plan, individual LSE IRPs, and the Preferred System Plan, should remain the same. So while stakeholder seemed to support process revisions, about half of survey respondents thought the process should also maintain the existing components. Of the remaining half, more supported de-emphasizing the Reference System Plan than de-emphasizing the Preferred System Plan.

Figure 4. Survey Responses on Focus of IRP Process



Gridworks notes that the Commission recently solicited formal comments from parties on the possibility of moving from a two-year to a three-year IRP cycle. Those comments appear consistent with the survey results.

In interviews, stakeholders noted that the time and resources required to develop and model the Reference System Plan were barriers to following the Energy Division's process closely and conducting

their own modeling. This situation creates a heavy dependence on the inputs, assumptions, and outputs from RESOLVE, which even under the best of circumstances cannot precisely match the conditions LSEs will confront in the real world when conducting procurement. Further, some stakeholders felt that RESOLVE is overly sensitive to small changes in the assumptions. Numerous stakeholders also noted that the RESOLVE model, from their perspectives, is not accurately forecasting GHGs in the electricity sector or resulting in a least cost portfolio.

B. Stakeholders Question the Impact of Their Participation in the Proceeding

In interviews, most stakeholders were complimentary about Energy Division staff's engagement and responsiveness in the IRP process, particularly in the Modeling Advisory Group process. Several also noted, however, that there is a lack of clarity on how the Commission considers and addresses filed comments. The large number of parties and filed comments seems to preclude specific responses, which leads to frustration. For outstanding issues, stakeholders noted that the Commission and staff recognize the concern, but it is not clear how or when the Commission may address it, if at all.

Survey results amplified interview perspectives. If, on a scale of 1 through 5, a "3" is considered "neutral" or "unclear" 62% of respondents do not believe the Commission understands their party positions and nearly 60% were not confident that their participation was valued by the Commission.

These challenges do not seem to be limiting parties' ongoing participation, however, as 69% of respondents would continue to invest in IRP participation, assuming a similar process as the one today. In interviews, some stakeholders noted their level of engagement and resources assigned to participation could be affected.

Figure 5. On a scale of 1-5, with 5 being the highest, how well do you think the Commission understands your party positions?
29 responses

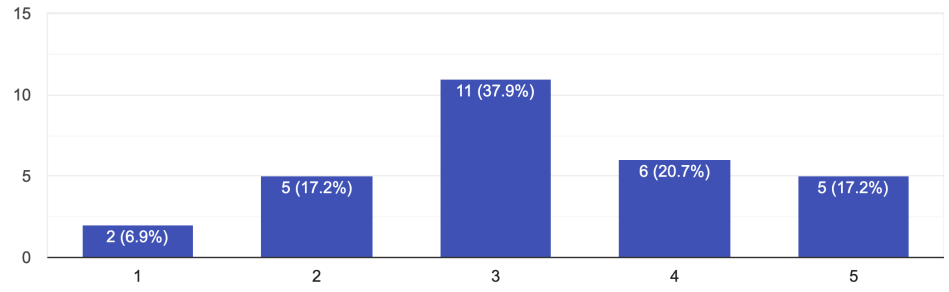


Figure 6. On a scale of 1-5, with 5 being the highest, how confident are you that your participation was valued by the Commission in its decision-making?
29 responses

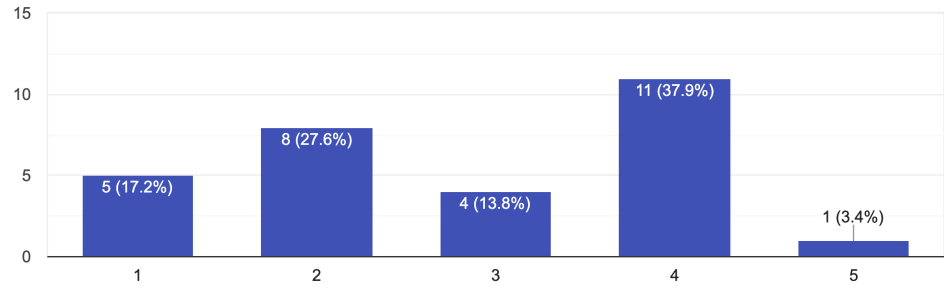
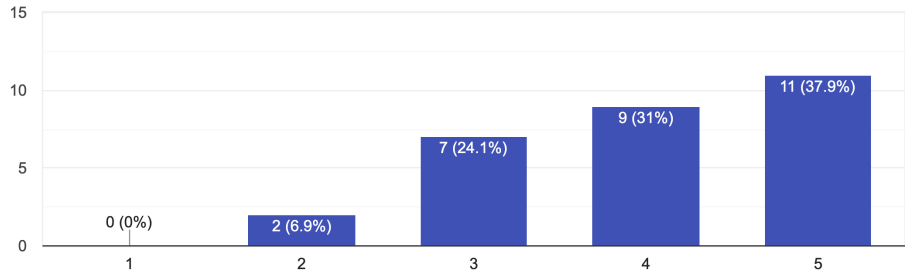


Figure 7. On a scale of 1-5, with 5 being the highest, how likely are you to invest in IRP participation going forward, assuming a similar process as the one today?
29 responses



Stakeholders also noted ambiguity on IRP compliance and the possible consequences. Two types of potential non-compliance concerns were raised: 1) failure to file an IRP or to comply with various content requirements[9] and 2) failure to fully implement an approved (or certified) IRP. Respondents suggested LSE compliance metrics may reduce confusion and increase effectiveness of the program, but the evaluation did not uncover specific metrics.

C. Parties are Concerned IRP is Not Meeting Legislative Objectives

While understanding that the IRP process is still relatively new, and that the 2017-18 cycle served as a "proof of concept" phase, stakeholders' feedback throughout the evaluation was that the IRP process is not achieving legislative objectives, with 86% of survey respondents indicating as such. Further, survey

[9] This suggestion is addressed by the Commission's citation program adopted in Resolution E-5080 on August 6, 2020, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M344/K706/344706530.PDF.

responses showed that 83% of parties believe the Commission has not adequately allocated its attention and resources to achieving legislative objectives.

Figure 8. On a scale of 1-5, with 5 being the highest, how well does the current Integrated Resource Planning process achieve Legislative objectives?
29 responses

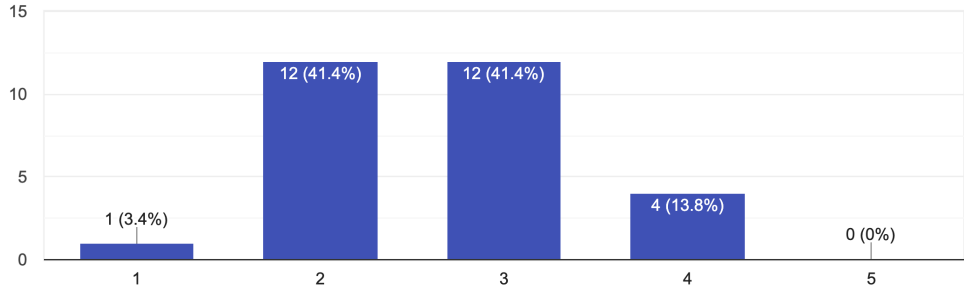
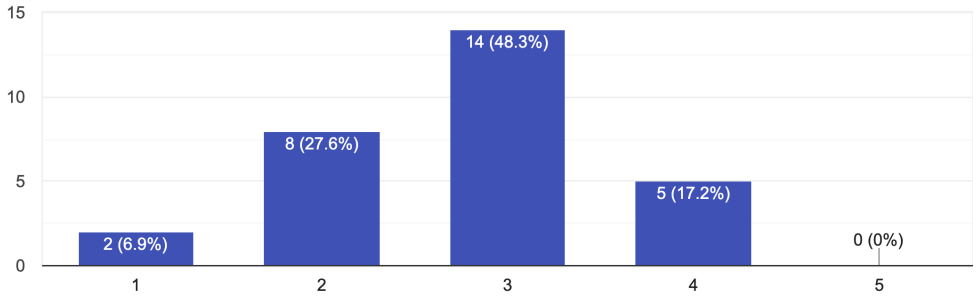


Figure 9. On a scale of 1-5, with 5 being the highest, how well has the Commission allocated its attention and resources to these Legislative objectives?
29 responses



The evaluation, however, did not uncover clear party perspectives on where the Commission's attention and resources should be focused to better achieve legislative objectives. For example, although approximately 30% of stakeholders identified ensuring reliability of the electric system as the legislative goal needing most additional attention, about 20% of stakeholders identified reliability as needing the *least* additional attention. The same trend was observed for reducing GHG and localized air pollutants. Table 1 summarizes survey results and key takeaways from stakeholder interviews.

Table 1: Stakeholder Responses Regarding IRP Legislative Objectives

IRP Goal	% of Stakeholders that Identified as MOST Needing Add'l Attention	% of Stakeholders that Identified as LEAST Needing Add'l Attention	Select Interview Takeaways
Reduce GHG and localized air pollutants consistent with legislative targets	28.6	21.4	A key success of the IRP process thus far is the integration of GHG constraints into IRP modeling and decision-making; however, some stakeholders believe the GHG constraints currently applied in the IRP process may be insufficient to achieve 2030 and 2045 climate goals.
Ensure reliability of the electric system	32.1	21.4	The 2019 procurement order within the IRP proceeding highlighted a potential gap in the IRP proceeding scope in the post-LTPP era. Exogenous factors, including the changes in solar Effective Load Carrying Capacity (ELCC) values, expected Resource Adequacy imports, and counting of hybrid resources for Resource Adequacy, also drove the near-term reliability need.
Ensure customers have access to electricity at least cost	10.7	17.9	Processing lag for IOU advice letters seeking approval of new procurement creates risk for resource developers and may inhibit least cost resources.
Procure a diverse set of supply- and demand-side resources	17.9	14.3	LSEs need more guidance and support on long lead time resources and resources that require coordination among multiple LSEs.
Strengthen local communities, with particular focus on disadvantaged communities	0	10.7	LSEs are required to report criteria air pollutants; however, portions of that data were redacted and stakeholders did not have access to that information. This has a greater impact in disadvantaged communities.
Coordinate electricity and GHG planning inputs and assumptions with the CEC, CARB, and CAISO	10.7	14.3	Coordination efforts with CAISO should seek to guide location of new resources to enable retirement of emissions-intensive plants and identify areas where transmission upgrades are needed to connect future resources.

The survey also invited parties to rank recommendations to the Commission which would best reflect the respondent's priorities as a party. Table 2 shows their response.

Table 2. Stakeholders' Selected IRP Priorities

Priority	%
Clarify the respective roles of the IRP and the Resource Adequacy proceedings in ensuring system and local reliability.	17
Further prioritize coordination with CAISO's Transmission Planning Process.	17
Do more to ensure that new resources contained in individual IRPs are actually contracted and developed.	14
Provide LSEs more guidance and support on large or long lead time resources that require coordination among multiple LSE.	14
Further prioritize assessment of how to reduce GHG-emitting generation.	10
Dedicate additional resources to ensuring its adopted GHG targets are consistent with California's GHG goals.	9
Invite and encourage parties to offer their own modeling as a complement to RESOLVE and SERVM.	9
Address party comments in greater detail in IRP decisions.	8
Prioritize processing of Advice Letters resulting from IRP orders.	2
	100

Gridworks observes that Tables 1 and 2 confirm the well-recognized fact that the IRP remains home to many competing priorities.

D. The IRP Proceeding Procurement Track Must Be Clearly Defined

In interviews, stakeholders identified that the IRP proceeding should be the procedural avenue to drive renewable and other clean resource procurement and retire fossil fuel generation plants. Further, survey results showed that stakeholders would like the Commission to do more to ensure that new resources contained in IRPs are contracted and developed, and to provide guidance and support on resources that require coordination among multiple LSEs. Stakeholders also identified the following issues as requiring greater clarity: (1) cost allocation method for resources procured by one LSE on behalf of another LSE; (2) guidance on long lead time resources; and (3) the potential impacts of reallocation or auction of PCIA-eligible resources on the relative procurement needs of different LSEs.[10] Given the numerous policy

[10] PCIA [Power Charge Indifference Adjustment]-eligible resources are resource commitments entered into by a utility, prior to the departure of a certain group of customers from bundled service, that now costs more than current market prices. The PCIA applies to customers of ESPs or community choice aggregators based on the "vintage" date of their departure from utility procurement service.

decisions related to these issues, Gridworks did not press stakeholders for specific details on how they may be clarified.

E. Greater Inter-agency Coordination is Needed

Several stakeholders identified a need for closer coordination with CAISO's Transmission Planning Process since studying the RSP as a policy-driven use case may be inadequate to ensure that transmission will be available to deliver future resources. While staff coordination is robust, coordination at higher levels of management and leadership is needed for broader strategic coordination to ensure transmission development where needed and to enable retirement of emissions-intensive plants.

Further, stakeholders identified the need for more focused coordination with the CEC on IEPR assumptions and the IRP processes at publicly-owned utilities, as well as coordination with CARB to more closely align the AB32 Climate Change Scoping Plan with IRP assumptions and outputs.

IRP Process Recommendations

Gridworks' recommendations provide an initial pool of options for the Commission's considerations. These recommendations primarily focus on future IRP cycles, but could be considered for inclusion in the 2019-20 cycle if timing permits.

Scope and Timing of the IRP Process

1. Initiate an Inclusive Stakeholder Process to Improve the IRP Scope and Stakeholder Engagement

This evaluation finds party support for maintaining a two-year IRP cycle with a modified scope. However, the evaluation did not uncover actionable recommendations from parties on how the scope would be best modified. Further, the evaluation finds low confidence among parties that the current process is achieving legislatively mandated objectives, or that party participation and input are valued and well-understood by the Commission.

Informed by these findings, Gridworks recommends the Commission initiate an inclusive stakeholder working group to prioritize modifications to the IRP process. The objectives would be two-fold: (1) design a two-year IRP process that better achieves legislative objectives and (2) foster party confidence in the process. Alternatives presented in Recommendation 2 should be introduced, vetted, and prioritized with stakeholders in this working group process prior to formal consideration within the proceeding.

2. Consider Alternatives for Accomplishing the IRP process in Two Years

Both interviewees and survey respondents indicate that the current focus points of the IRP -- specifically the Reference System Plan, individual LSE IRPs, and the Preferred System Plan -- should remain the same. However, there is an inherent tension between this suggestion and the desire to complete the IRP in two years. Therefore, Gridworks offers the Commission the following alternatives for consideration:

a. De-emphasize the Reference System Plan, focusing instead on individual IRP development and the Preferred System Plan. It is possible that future Reference System Plans can be produced more quickly now that the basic modeling framework has been established, but there remain significant party concerns about the accuracy and robustness of the modeling results. In any event, actual procurement efforts will reveal different pricing and potentially even different technologies than modeled outputs, potentially leading to LSE procurement of a different resource mix than indicated in the Reference System Plan.

b. De-emphasize individual IRP development and the Preferred System Plan, focusing instead on the Reference System Plan. This reflects more of a central planning approach that is unlikely to appeal to individual LSEs. Reference System Plan assumptions may become outdated and result in sub-optimal results, as noted above.

c. De-emphasize the creation of a complete Preferred System Plan, focusing instead on developing the Reference System Plan and individual IRPs *in parallel*. The aggregation of individual IRPs would then be compared to the Reference System Plan and the Commission, after a public process, would issue directives and guidance to ensure that the necessary and preferred combination of resource attributes required for reliability and GHG compliance is achieved.

Gridworks recommends that the Commission give careful consideration to Alternative C. Under this approach, the "first year" of the IRP cycle may take 10 - 14 months. LSEs would develop their individual IRPs at the same time that staff develops the Reference System Plan with a target for completing the plans set at six to eight months. The next step would include aggregation of individual IRPs into a Hybrid System Plan and comparison of the results to the Reference System Plan, and would be completed in four to six months. The "second year" of the IRP cycle may also take 10-14 months and would include one or more rounds of careful analysis to bridge any gaps between the Hybrid System Plan and the Reference System Plan. The Commission would employ workshops or hearings as needed, followed by party comments or briefs. The Commission would issue a decision by the end of year two providing guidance, and specific direction where needed, to ensure that the resulting LSE procurement produces as close to an optimal combination of reliability, GHG reduction, and low cost as possible.

This basic process would be repeated every two years, with the option for the Commission to consider specific issues on a one-off basis on a parallel track during year one of the cycle – issues such as longer-term Local Resource Adequacy needs, potential gas plant retirements, Diablo Canyon retirement, and procurement of long-lead time resources that may also require transmission development.

3. Delegate Development and Vetting of Modeling Inputs and Assumptions

This evaluation found that parties were complimentary and appreciative of time spent by staff to understand party perspective and pleas. Numerous parties felt that time spent with staff provided relief from their frustrations with the formal IRP process and breakthroughs which led to better decision-making by the Commission.

Recognizing this finding, Gridworks recommends careful consideration and prioritization of staff time and availability to parties. Staff time and availability should be reserved for the highest-priorities of the proceeding and parties, as shown above in Table 2.

Development of modeling inputs and assumptions for the Reference System Plan has occupied significant staff time. Given these efforts, Gridworks finds this process to be well-established among parties and well-supported by consultants. Therefore, we recommend that the Commission delegate development and vetting of inputs and assumptions to a task force of consultant-led parties. This task force would develop and document options for inputs and assumptions that the Commission's Modeling Group could review and ultimately and determine which would be leveraged for IRP modeling.

4. Enrich Regular Modeling Efforts with Supplemental Scenario Analysis, Conducted on an As Needed Basis

In interviews, stakeholders noted a heavy dependence on the inputs, assumptions, and outputs from RESOLVE, with some stakeholders identifying that RESOLVE is overly sensitive to small changes in the assumptions. Numerous stakeholders also noted that the RESOLVE model, from their perspectives, is not accurately forecasting GHGs in the electricity sector or resulting in a least cost portfolio.

Given this finding, Gridworks recommends the Commission supplement IRP modeling with periodic scenario analyses covering multiple different long-term portfolios of potential resources. The Commission, in coordination with parties, could develop a range of scenarios to inform the analysis, which might best be carried out by an outside consultant that would interact with a stakeholder advisory committee. Alternatively, the Commission could provide guidance to LSEs

to develop and share scenario analysis methods and results in the development of their individual IRPs.

The Los Angeles Department of Water and Power (LADWP) has taken such a multi-scenario approach in partnership with the National Renewable Energy Lab (NREL) and several technical consultants to develop options for LADWP's 100% Renewables Study, which informs their Clean Energy Future initiative, Long-Term Strategic Plan, and their IRP submitted to the CEC.[11] The LADWP scenarios include one based on SB 100, another with a high level of transmission development, a third with higher levels of distributed generation, and a fourth "LA Leads" scenario with targets achieved by 2035 rather than 2045. These scenarios were evaluated under both moderate and high electrification load forecasts, as well as a single, stressed, very high load forecast. The analysis expands beyond consideration of technical pathways to 100% renewables, and also includes analyses for impacts to jobs, the local economy, local air quality, and environmental justice.[12]

This type of major undertaking might be pursued only once or twice over time, but would provide a broader look at potential pathways to achieve the state's long-term goals over an extended time duration, so that shorter-term biennial IRP decisions do not inadvertently miss beneficial longer-term strategies. At minimum, Gridworks suggests that Commission staff coordinate with LADWP to obtain the information and insights resulting from their study, and to understand what changes to the City's electric system will be occurring in the future and their impacts to the CAISO grid.

5. Determine the Ultimate Role of the IRP Procurement Track and Clarify the Respective Roles of the IRP and the Resource Adequacy Proceedings in Ensuring System and Local Reliability

This evaluation finds concern among interview and survey participants about the success of IRP in meeting Local and Flexible Resource Adequacy needs and confusion and frustration with the 2019 order to procure to meet reliability needs which were not established in the IRP proceeding.

Gridworks recommends resolving any ambiguity about the role of IRP in ensuring reliability by clearly establishing that the IRP process is responsible for ensuring that adequate resources exist on the system for LSEs to meet all of their near-term Resource Adequacy needs—system, flexible, and local.

To operationalize the role of IRP in ensuring reliability, Gridworks suggests the Commission could co-lead a Reliability Working Group with CAISO to address resource needs, coordinate with the

[11] For more information, please refer to http://www.ladwp.com/CleanEnergyFuture.

[12] See Advisory Group Meeting #12 presentations for July 9, 16, and 23, 2020 at https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-cleanenergyfuture/a-p-renewableenergystudy.

Transmission Planning Process, and co-develop a plan to retire emissions-intensive plants in disadvantaged communities. The Reliability Working Group could start with determining whether any Commission action is warranted to address the most recent CAISO Local Resource Adequacy study, which included information about the potential for storage to displace gas generation in local areas. At minimum there should be a Commission workshop or working group on that aspect of the CAISO studies, to highlight the results and determine if other or different studies are needed, or if any further Commission direction is required.

Stakeholder Engagement

6. Form Multiple Stakeholder Working Groups to Address Priority Issues

The survey results indicate that 62% of respondents do not believe the Commission understands their party positions and nearly 60% were not confident that their participation was valued by the Commission. Stakeholders did, however, recognize and appreciate the efforts among staff to understand party perspectives and make adjustments, where appropriate.

Given this finding, Gridworks recommends that the Commission prioritize staff resources for focused stakeholder engagement by forming multiple stakeholder working groups to address priority issues, such as Local Reliability needs and potential gas plant retirements, Diablo Canyon replacement, and/or long-lead time resource procurement. Working groups have been leveraged in many of the Commission's proceedings but seem to have had limited applications in IRP to date. If working groups are formed, staff could leverage a portion of working group meetings for individual party engagement, such as office hours for specific topics. At a minimum, Commission staff should continue to hold office hours with stakeholders to address priority issues.

The Hawaii Public Utilities Commission's Integrated Grid Planning process, which covers long-term infrastructure and generation planning, may provide an example. The process leveraged four working groups with distinct work streams to address Forecast Assumptions, Resilience Planning Criteria, Distribution Planning, and Markets. The Market Working Group consisted of four interrelated subgroups to standardize contracts and service agreements language, identify and define grid services, develop methods for evaluating and optimizing solutions, and define a competitive procurement process.[13] The Commission could take a similar approach for priority issues such as Modeling Inputs and Assumptions, Long-term Local Reliability Issues, and/or IRP Compliance Metrics.

[13] For more information on Hawaii's Integrated Grid Planning working groups, refer to https://www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning/stakeholder-engagement/working-groups.

7. Hold Multiple *En Banc* Hearings or All-Party Meetings throughout the IRP Process

In interviews, stakeholders expressed that the frustration with feeling unheard or undervalued was a result of a perceived lack of bandwidth, understanding, or action among the Commissioners, who are subject to rigid standards regarding stakeholder interaction.

To allow Commissioners to hear from stakeholders in an open setting, Gridworks recommends that the Commission hold multiple en banc hearings or all-party meetings, including CAISO, CEC, and CARB representatives where possible, throughout the IRP process. At a minimum, the Commission should hold en banc hearings before major decisions are adopted.

Transparently Track Procurement Progress

8. Require LSEs to Provide Information on Procurement Status and Publish Non-Confidential Data

Parties' priorities include the Commission acting to ensure that new resources contained in IRPs are contracted and developed, and providing guidance and support on resources that require coordination among multiple LSEs. Further, stakeholders consistently spoke of the importance of having up to date information on the status of resource procurement so that the planning context in future IRP cycles can reflect reality as closely as possible.

To try to keep planning aligned with on-the-ground conditions, and provide parties with timely information for future IRP assumptions, Gridworks recommends that the requirement that LSEs provide information about procurement contracting status and resource development status should be applied broadly to all long-term procurement, not just to the 3,300 MW ordered in 2019.

LSEs should report to the Commission at least twice a year on the contracts that have been signed and related development milestones (e.g., siting and permitting, financing, start of construction, etc.). Energy Division should manage a public database that discloses non-confidential data on contracting status and development status. The actual procurement data could be shared with the CAISO to facilitate transmission planning as well.

Inter-agency Coordination

9. Reconvene Coordination Meetings Among Principals at the Commission, CEC, CAISO, and CARB

   Throughout interviews and survey responses, stakeholders identified the need for stronger coordination points on several priority inter-agency processes including the CEC's IEPR forecast, CAISO's Transmission Planning Process, and CARB's Scoping Plan. In some cases, the efforts among staff were highlighted and appreciated again, but coordination among higher levels of management and leadership were identified as needing more attention.

   Given this finding, Gridworks recommends that the Commission, CEC, CAISO, and CARB reconvene coordination meetings to strategize on interrelated planning processes. The agencies should leverage an independent facilitator to alleviate the burden on staff to organize and manage these meetings. These meetings may lead to the development of inter-agency working groups to tackle specific issues identified by the Principals.

Conclusion

There is no perfect planning process, and tradeoffs must be made among competing objectives, including achieving greater accuracy, encouraging broad participation, and ensuring timely decisions. There have been many lessons learned through the Commission's IRP and the Commission and staff have generally shown that they welcome—and are willing to implement— suggestions for improvements. At the same time, parties to the proceeding often have conflicting goals and priorities, so there may be no end to the learning aspect of this process. Gridworks hopes that the information and recommendations in this report will contribute toward a process of continuous improvement for the IRP in California.