

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE  
STATE OF CALIFORNIA**

Order Instituting Rulemaking to Develop  
An Electricity Integrated Resource Planning  
Framework and to Coordinate and Refine  
Long-Term Procurement Planning  
Requirements.

Rulemaking 16-02-007  
(Filed February 11, 2016)

**COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR  
CORPORATION**

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**I. Introduction**

Pursuant to the Commission’s Order Instituting Rulemaking (OIR) opening this proceeding, the California Independent System Operator Corporation (CAISO) provides comments regarding the institution of an integrated resource planning (IRP) process. These comments focus on three distinct, but interrelated issues: (1) categorization; (2) process alignment; and (3) modeling purposes and needs.

**II. Categorization**

The CAISO believes the Commission should re-categorize this proceeding as quasi-legislative. The Commission’s Rules of Practice and Procedure define a quasi-legislative proceeding as one that establishes “policy or rules (including generic ratemaking policy or rules) affecting a class of regulated entities, including those proceedings in which the Commission investigates rates or practices for an entire regulated industry or class of entities within the industry.” Senate Bill 350 requires the Commission to “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.” The rules promulgated in this proceeding will be generic to a class of regulated utilities, namely, all load serving entities (LSEs) under the Commission’s jurisdiction. As a result, the IRP falls squarely within the definition of a quasi-legislative proceeding.

In addition, developing the IRP process will require active participation from the Commission. The IRP will impact not only the Commission’s planning and procurement practices but also the planning processes of the CAISO and California Energy Commission (CEC). The CAISO anticipates that alignment among the agencies’ forecasting, planning and procurement processes will be a key component to establishing a workable IRP process.

Commissioners must play an active role in ensuring process alignment and a top-to-bottom understanding of the roles and responsibilities of each of the affected agencies. Ex parte reporting requirements will unnecessarily limit Commissioner input and may lead to a process that does not adequately support the Commission's goals. Therefore, with respect to development of the IRP process, the Commission should re-categorize this proceeding as quasi-legislative.

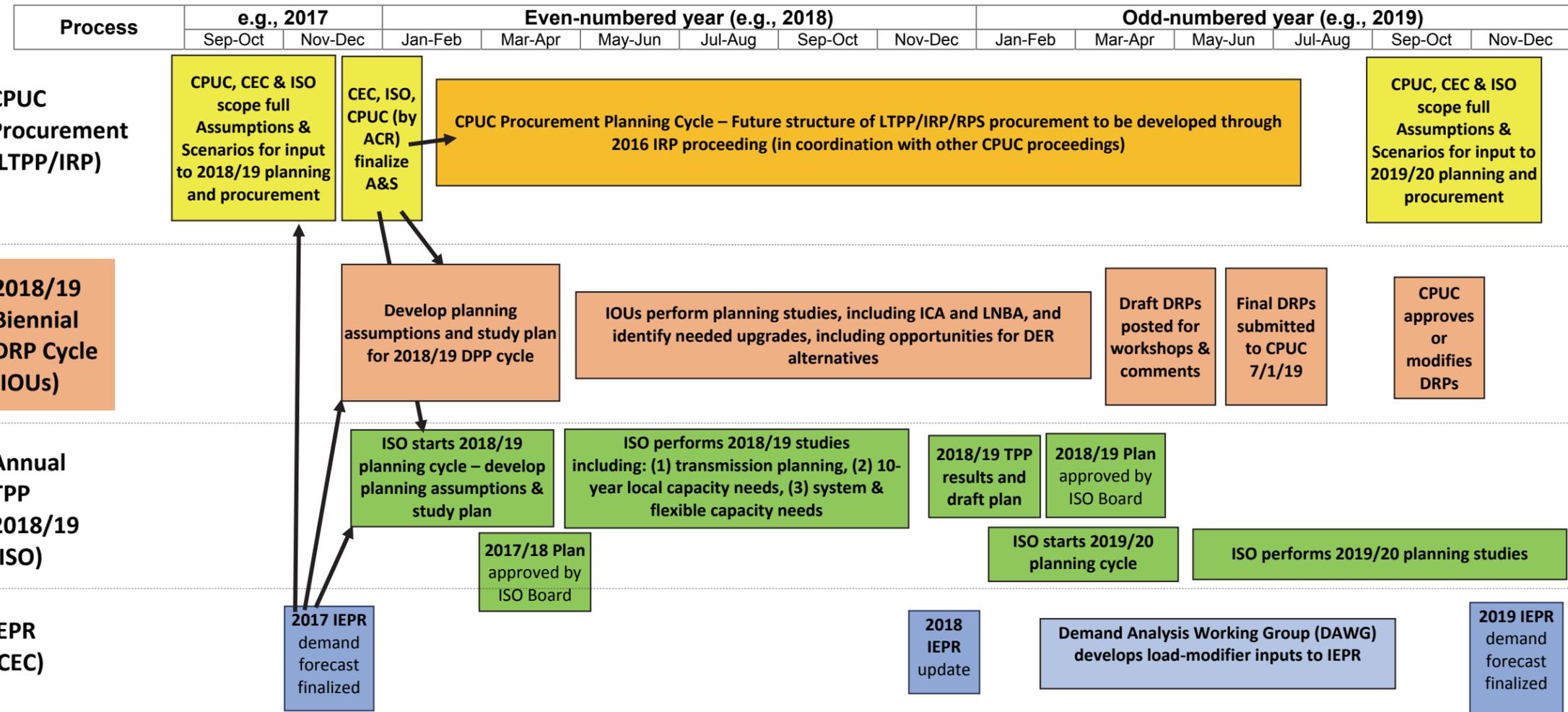
### **III. Process Alignment**

In the course of this proceeding the Commission should address how the IRP will align with existing planning, procurement, and state forecasting processes. Such alignment is essential to ensure that all planning and procurement activities work from a common set of assumptions and consider agreed-upon scenarios of future development and system conditions. Since 2014, the staff of the Commission, the CEC, and the CAISO have collaborated to seek to workably align the CAISO's transmission planning process (TPP), the long-term demand forecast within the CEC's Integrated Energy Policy Report (IEPR), and the Commission's long-term procurement plan proceeding (LTTP).<sup>1</sup> In 2015, discussions in Commission workshops in the distribution resources plan (DRP) proceeding and the More Than Smart working group explored how, if the Commission were to establish a cyclical process for refreshing the DRPs could best align with the other three processes.

With the advent of the new IRP process required by Senate Bill 350, the CAISO recommends that the Commission consider the work already done in these prior efforts as a starting point for exploring alignment of the IRP with the other foundational processes. The CAISO and other stakeholders have begun to discuss a conceptual framework for integrating all of these processes. This preliminary conceptual framework is presented below:

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<sup>1</sup> A detailed diagram and explanatory documentation describing the IEPR-LTTP-TPP process alignment can be found here: <http://www.caiso.com/planning/Pages/TransmissionPlanning/Default.aspx>.



It is important to highlight a few elements of this conceptual framework. First, several arrows indicate important information flows, but only at the front end of the diagram. Further development of this framework would entail adding detail on the timing and content of information flows between the processes at a level of specificity comparable at least to the IEPR-LTPP-TPP diagram linked in the prior footnote. Second, the inter-agency collaborative “assumptions and scenarios” (A&S) activity that occurs in the fourth quarter of each year is a crucial element of process alignment because it establishes essential common inputs to ensure consistency among the planning and procurement processes.<sup>2</sup> Third, the CEC’s IEPR demand forecast is a crucial input to formation of the A&S. Fourth, though not shown in the above diagram, if the diagram is extended several years into the future to show subsequent cycles of all the process, it would illustrate how the outcomes of the planning and procurement processes become inputs into subsequent IEPR and A&S activities. Thus, regular cyclical repetition of the key processes, with the associated information flows and feedback loops, works to ensure consistency among the processes and provides the ability to adapt to new developments in California’s electricity sector.

The IRP OIR indicates that the IRP process will likely build upon the LTPP and the results of other procurement activities administered through various Commission proceedings.<sup>3</sup> As a result, the IRP process may naturally align in the LTPP swim lane of the conceptual framework. The CAISO recognizes that the Commission may have other considerations that bear on the alignment of the IRP with other processes, and therefore the CAISO offers the conceptual framework above only to inform the Commission of the collaborative work that has already been done and as a potential starting point for aligning the IRP process with these other activities.

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<sup>2</sup> In its comments on the Commission’s draft DRP roadmap in November 2015, the CAISO described a significant needed enhancement to the A&S process, and advocated that the Commission work with the other agencies and stakeholders to develop cyclical process for creating and refreshing growth scenarios for distributed energy resources (DER). Such scenarios should become a foundational element of the process alignment. See [http://www.caiso.com/Documents/Nov20\\_2015\\_Comments\\_DistributionResourcesPlanRoadmapStrawProposal\\_R14-08-013.pdf](http://www.caiso.com/Documents/Nov20_2015_Comments_DistributionResourcesPlanRoadmapStrawProposal_R14-08-013.pdf).

<sup>3</sup> IRP OIR, p. 2. (“These new Legislative requirements represent a logical evolution that builds on our work in previous long-term procurement planning (LTPP) proceedings and evolves and refines the implementation of the decade-long procurement “loading order” policy.”)

As the Commission proceeds to consider the practical details of the new IRP process and its relationships to other planning and procurement processes, some of the questions the Commission needs to address are as follows:

- What essential inputs should the IRPs assume and how are they formulated and provided to the LSEs for developing their IRPs?
- What are the intended outputs of the investor-owned utility (IOU) IRPs? Will Commission decisions on the IOU IRPs authorize IOU procurement or do the IRPs merely inform other CPUC proceedings that will authorize IOU procurement?
- How does the Commission envision using the outputs of the IRPs of the non-IOU LSEs (ESPs and CCAs)? How should these IRPs affect, inform, or be reflected in the other process alignment components? For example, with respect to the service areas of CCAs that are designing their own Senate Bill 350 procurement strategies to emphasize local resource development, the CCAs themselves may have valuable information to contribute to DER growth scenarios for distribution and transmission planning.
- How and when are IRP outputs reflected in the CEC's IEPR and then brought into the A&S, which feed into the CAISO's TPP and the IOUs' DRPs?
- What is the role of the IRP in optimizing solutions that serve the various needs of the grid? For example, does the Commission anticipate that the IOU IRPs would address resource needs both for serving IOU load and for meeting distribution system needs, or would the Commission rule on these two types of needs in separate proceedings? Similarly, will the IRP be the venue for authorizing IOU procurement in cases where the CAISO's TPP determines that a DER solution could effectively offset the need for a transmission upgrade? What role would the IDER proceeding play in these questions?
- How will the IRPs of all CPUC-jurisdictional LSEs, including ESPs and CCAs, inform the Commission's process for developing the RPS portfolios that are provided as input to the CAISO's TPP for identifying needs for public policy-driven transmission projects?
- Will distribution system needs and potential asset deferrals first be identified in the DRPs, which will then inform the IDER process, whose results will in turn inform the IRP process?

It is important that the agencies and stakeholders understand their respective roles and the interdependencies in these planning, procurement, and forecasting processes. The process

alignment discussed in this section can be a crucial foundation to enable these processes to achieve the state's reliability, cost effectiveness, and greenhouse gas reduction objectives. The CAISO is prepared to work closely with the Commission and the CEC to develop the needed process alignment in a manner that is practical and effective and enhances the transparency and regularity of these key state processes.

#### **IV. Modeling Purposes and Needs**

The Commission highlighted the need to catalog existing modeling capabilities during its December 2, 2015 IRP workshop. Whereas the process alignment discussed above deals with the timing of the processes and the coordination and information flows between them, the modeling topic concerns the methodologies the individual processes must utilize in connection with their required analytical and forecasting tasks. Meeting the new analytical demands arising from DER growth, distribution planning, and optimization of a larger set of constraints and objectives will require new generating new outputs and a careful review of existing modeling methodologies to identify gaps. In this section, the CAISO identifies some of the main needs it sees and recommends that the Commission consider these needs in developing its catalog.

As a starting place, the Commission should consider the “duck curve” in the context of the current approach to long-term demand forecasting. Traditional long-term forecasting has provided estimates of future total annual energy (GWh) and peak demand (GW). The duck curve indicates that total energy and peak demand, while still important, are not sufficient by themselves for effectively planning for a highly renewable and distributed system. CPUC Staff's Grid Integration white paper has highlighted many of these new challenges and offered solutions and areas of improvement. Planners must understand what the entire load profile will look like, particularly the depth of the mid-day low point of net load (*e.g.*, the belly of the duck), the size and rapidity of the late afternoon ramp (*e.g.*, the neck of the duck), and the likely shift of the system peak demand to later in the day after solar production declines. This means that forecasting methodologies will need to provide 24-hour load profiles, not just forecasts of peak demands and total energy.

Along the same line, the proliferation of DER, which will reflect a mix of autonomous customer adoption and LSE procurement, will change both the size and the shape of load that reaches the CAISO at the transmission-distribution interfaces to constitute the system load shape. If the DERs consist primarily of rooftop solar photovoltaic (PV) resources, the forecasting

methodology can use statistical weather data to fairly accurately predict output and adjust the net load accordingly. This simplicity vanishes, however, when combinations of solar PV with storage become more prevalent, because storage introduces a controllable element that can be used, for example, to optimize the 24-hour energy profile of the end-user. “Optimization” in this context will be closely tied to the rate structure of the end-user, *i.e.*, such factors as the price differential between time-of-use (TOU) periods and the definitions of the TOU periods themselves, as compared to net-energy metering (NEM) compensation rates and the structure of distribution charges. Again, the Commission staff Grid Integration White Paper identifies these challenges and the opportunities to leverage distribution-level solutions such as TOU rates and electric vehicle charging. The methodological challenge, then, is to incorporate these developments into forecasts of future load profiles.

If the duck curve is viewed as a challenging, but potentially manageable, complication on the road to low-carbon electricity, then a question for planning and procurement activities, at both distribution and transmission levels, is how to determine the mix of resources – including those procured by LSEs and those adopted by customers responding to non-price factors or policy-based financial incentives – that will be most effective in “flattening” the duck.<sup>4</sup> For example, one directive of Senate Bill 350 is to dramatically expand energy efficiency. As a result, it will be even more imperative to build a modeling capability to estimate load shape impacts of various energy efficiency measures, including both average time of day effects and seasonal variations of those effects. More generally, modeling and impact assessment methodologies will be needed to predict how various DER types, in combination with policy measures such as rate structures for distribution service and other incentives, can effectively raise the belly of the duck in local areas of the grid, and how these local impacts then translate up to the load curve at the CAISO system level and within the local capacity areas. As DER adoption and policy measures become more effective in smoothing load profiles at the local level, it may be possible to enhance greenhouse-gas compliance more cost-effectively by avoiding the need for fossil-based fast-ramping resources, but designing the policies and procurement strategies to achieve these outcomes will require modeling and analytical capabilities that have not been needed to any great extent previously.

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<sup>4</sup> Lazar, J. (2016). Teaching the “Duck” to Fly, Second Edition. Montpelier, VT: The Regulatory Assistance Project. Available at: <http://www.raponline.org/document/download/id/7956>.

The above are some of the new modeling and analysis capabilities the CAISO believes will be needed for moving into the Senate Bill 350 planning and procurement paradigm in the most cost effective manner. The CAISO looks forward to supporting the Commission's efforts to catalog modeling capabilities and identify specific gaps and needs.

**V. Conclusion**

The CAISO looks forward to participating in this proceeding and working with the Commission to meet the state's energy and environmental goals.

Respectfully submitted,

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