BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769.	Rulemaking 14-08-013 (Filed August 14, 2014)
Application of Southern California Edison Company (U338E) for Approval of Its Distribution Resources Plan.	Application 15-07-002 (Filed July 1, 2015)
Application of San Diego Gas & Electric Company (U902E) for Approval of Distribution Resource Plan.	Application 15-07-003 (Filed July 1, 2015)
In the Matter of the Application of PacifiCorp (U901E) Setting Forth its Distribution Resource Plan Pursuant to Public Utilities Code Section 769.	Application 15-07-005 (Filed July 1, 2015
In the Matter of the Application of Pacific Gas and Electric Company for Adoption of its Electric Distribution Resources Plan Pursuant to Public Utilities Code Section 769 (U39E).	Application 15-07-006 (Filed July 1, 2015)
Application of Liberty Utilities (CalPeco Electric) LLC (U933E) for Approval of Its Distribution Resources Plan.	Application 15-07-007 (Filed July 1, 2015)
In the Matter of the Application of Golden State Water Company on Behalf of its Bear Valley Electric Service Division (U913E) for Approval of its Distribution Resource Plan.	Application 15-07-008 (Filed July 1, 2015)

RESPONSE OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

I. Introduction

Pursuant to the Administrative Law Judge's July 27, 2015 Ruling, the California Independent System Operator Corporation (CAISO) files this response regarding the distribution resource plans (DRPs) filed pursuant to Public Utilities Code section 769. The CAISO appreciates the diligent and thoughtful efforts the utilities have put into their DRP filings, and believes the DRPs represent a major milestone toward creating a comprehensive planning and

procurement framework for California that encompasses the entire range of distributed energy resources (DER) to include renewable generation and storage as well as more traditional resource types. At this time the CAISO offers comments regarding the alignment of a new ongoing DRP process with other key planning and procurement activities, specifically the California Energy Commission's (CEC) Integrated Energy Policy Report (IEPR) demand forecast, the California Public Utilities Commission's (Commission) Long Term Procurement Plan (LTPP) proceeding, and the CAISO Transmission Planning Process (TPP).

II. Discussion

Driven by state policies, customer adoption rates and rapid increases in the cost effectiveness of DER, both on the customer side and the utility side of the meter, DER growth promises to accelerate in the coming years. It is therefore essential that DER growth be considered as accurately as possible in state planning and procurement activities. The DRPs filed by the utilities, following the direction of Public Utilities Code section 769 and the Commission's February 2015 guidance order, make great strides in developing methodologies and tools to enable DER growth and estimate that growth for forecasting and planning purposes. Thus it is both necessary and practical for future DRP cycles to provide valuable information into the IEPR, LTPP and TPP cycles, and in turn to be informed by those processes, which underscores the importance of making sure all four processes are properly aligned.

During 2013 and 2014 CAISO, Commission and CEC staff collaborated to align the timelines and specify key information flows between the IEPR biennial demand forecasting, the biennial LTPP proceeding and the annual TPP. The alignment was designed:

> "to:
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> - Ensure that the various resource planning studies and related activities are based on consistent and up-to-date inputs;
> - Establish clear expectations among the stakeholders and the agencies regarding the timing of flows of information, study results and other inputs between the processes;
> - Maximize inter-agency collaboration in the development of key assumptions and study approaches; and, thereby
> - Meet California's energy and environmental policy goals in a coordinated and effective manner.
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> In addition to aligning the three core processes, the agencies also agreed on an annual process to be performed in the fall of each year to develop planning assumptions and scenarios to be used in infrastructure planning activities in the

coming year. The assumptions include demand, supply and system infrastructure elements, including the renewables portfolio standard (RPS) portfolios as a key assumption.[1]"

Coordination of procurement and planning activities among the Commission, CEC and CAISO is essential in this transition period for California's electricity system to achieve the state's policy goals. Such coordination requires clarity and regularity regarding the content and timing of key forecast elements and technical studies that inform these processes, to ensure that procurement and planning decisions are based on consistent and up-to-date assumptions. With the expanding presence of DER in the electricity system, the CAISO fully supports the Commission's proposal to create an ongoing biennial cycle to refresh the DRPs, yet the CAISO emphasizes that fully realizing the value of the DRP cycle will depend crucially on its alignment with these other established planning and forecasting processes.[2]

At this time the CAISO does not have a specific proposal for aligning the new DRP cycle with the other three processes. Rather, the CAISO urges the Commission to emphasize the need for careful process alignment in its rulings in this proceeding and to conduct one or more workshops or similar activities on process alignment prior to issuing a decision that sets the timing and structure of a recurring DRP cycle. In addition the CAISO offers the following considerations and suggestions.

A. The CEC's IEPR long-term demand forecast is foundational to state procurement and planning activities.

The CEC's IEPR is a biennial forecast that results in a new long-term forecast at the end of each odd-numbered year, with formal adoption by the CEC early in the next year.[3] At a high

[1] From "Alignment of Key Infrastructure Planning Processes by CPUC, CEC and CAISO Staff," December 23, 2014; available at http://www.caiso.com/Documents/TPP-LTPP-IEPR_AlignmentExplanatoryText.pdf and included as Attachment A to these comments. A schematic representation of the aligned process timelines and key information flows is available at http://www.caiso.com/Documents/TPP-LTPP-IEPR_AlignmentDiagram.pdf and is included as Attachment B to these comments.

[2] Although not discussed further in these comments, the CAISO notes that there is also a need for coordination among utilities regarding DER growth scenarios considered in their DRPs. In particular, the DER growth scenarios should be based on a consistent set of inputs and assumptions. Common inputs and assumptions in the DRPs will allow more meaningful coordination between the DRPs and the other planning and forecasting processes discussed herein.

[3] The CEC recently instituted a process for updating the biennial forecast at the end of each intermediate (even-numbered) year. The first of these forecast updates at the end of 2014 focused mainly on the economic and demographic drivers of gross demand and simply retained the demand modifiers used in the 2013 forecast. Going forward, with the rapid rates of DER growth anticipated it will probably be desirable to incorporate updates to some of the demand modifier forecasts as well.

level, the IEPR forecast has two main components: the economic and demographic forecast of gross energy demand, and a set of load modifiers that typically offset a portion of the gross demand. The load modifiers include behind-the-meter DER such as energy efficiency, load-modifying demand response and distributed generation. During the course of each IEPR cycle the CEC coordinates through the Demand Analysis Working Group (DAWG) a series of stakeholder meetings to vet the assumptions and methodologies used to create the IEPR demand forecast.

Because DER will have a growing impact on IEPR outcomes, particularly as load modifiers, the process alignment must specify information flow from the DRPs into DAWG activities that review and incorporate forecasts of load-modifying DER. Although long-term forecasts of DER adoption do not appear to be explicitly required by the DRPs, the DRPs will provide key ingredients for such forecasts, for example, hosting capacity and net locational value by distribution feeder. The DRPs are also expected to derive implications of DER growth for needed investment in distribution infrastructure. The CAISO therefore believes that explicit coordination between the DRPs and development of forecasts of load-modifying DER adoption for the IEPR is both necessary and logical to support the objectives of process alignment.

B. The IEPR demand forecast must be locationally granular to the level of the transmission-distribution substation.

Bus-level granularity – i.e., to the level of the transmission-distribution substation, which is also a pricing node in the CAISO wholesale markets – is required for transmission planning. The information developed in the DRPs should support this level of granularity. Although some of the utilities' comments indicate that the CAISO needs only utility-level or system-level forecasts for the TPP, this is not correct. Bus-level granularity will become increasingly important for the distribution utilities and the CAISO to facilitate the use of DER to offset or defer distribution or transmission infrastructure upgrades, respectively, where it is cost-effective to do so. The CAISO notes that PG&E, SCE and SDG&E all clearly intend to develop DER projections at a highly granular level for distribution system planning, so the point here is only to ensure that the same level of granularity be carried over to the IEPR demand forecast. That said, it is also important to evolve the approaches used in the DAWG to ensure that the granularity level provided by the DRPs is fully utilized in the IEPR.

C. The most recent DRPs should be considered in the annual "assumptions and scenarios" (A&S) process.[4]

As noted above, the current process alignment creates an annual inter-agency activity to develop assumptions and scenarios that become inputs to the CAISO TPP and studies that are the basis for procurement consideration in the LTPP. The annual A&S activity includes a Commission workshop for stakeholders to review and comment on draft assumptions and scenarios, and typically ends with a Commission Assigned Commissioner Ruling to adopt the results. The CAISO believes it is important to take account of DRP results in formulating assumptions and scenarios for the upcoming LTPP and TPP cycles, and therefore the most recent DRPs would be a key input into the A&S process.

In parallel with the A&S process the Commission formulates the renewable portfolio standard (RPS) resource portfolios to be used in the CAISO TPP to identify needed public policy transmission upgrades. With the growth of DER on the system, both as supply resources that can count toward RPS requirements and as demand modifiers that reduce the denominator of the RPS need calculation, it becomes increasingly important to reflect DER growth accurately in developing the RPS portfolios for procurement and infrastructure planning.

D. Coordination of the DRPs with the utilities' general rate cases (GRCs).

Public Utilities Code section 769 states: "Any electrical corporation spending on distribution infrastructure necessary to accomplish the distribution resources plan shall be proposed and considered as part of the next general rate case for the corporation." Even though the utilities' GRCs are staggered three-year cycles, the CAISO believes it is possible and desirable to comply with this direction under a biennial DRP cycle in which all the utilities refresh their DRPs at the same time and in coordination with the other process alignment elements discussed in these comments. The CAISO believes that departing from this DRP structure to try to better align with the GRCs would seriously compromise the objectives of the planning and procurement process alignment, and should not be necessary.

III. Conclusion

The CAISO looks forward to continuing its participation in this important proceeding, and in particular is prepared to work with the staff of Commission and CEC and with the utilities

[4] See Attachment A pp. 3-4.

and stakeholders to assist the Commission in developing the optimal alignment between a new biennial DRP cycle and the other key forecasting, planning and procurement processes.

Respectfully submitted,

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Dated: August 31, 2015

ATTACHMENT A

Alignment of Key Infrastructure Planning Processes
by CPUC, CEC and CAISO Staff
December 23, 2014

Introduction and Summary

Since the restructuring of California's electric industry in the late 1990s pursuant to AB 1890, electric infrastructure planning in California has been split among the California Energy Commission (CEC), California Public Utilities Commission (CPUC), and California Independent System Operator (CAISO) (collectively the "energy agencies"). Legislation modifying electricity planning responsibilities of both the CEC and CPUC was passed in 2002.[1] [2] Three major cyclical processes now form the core of electric infrastructure planning:[3]

- Long-term forecast of energy demand produced by the CEC as part of its biennial Integrated Energy Policy Report (IEPR),
- Biennial Long Term Procurement Plan proceeding (LTPP) conducted by the CPUC, and
- Annual Transmission Planning Process (TPP) performed by the CAISO.

More recently, with the adoption of new energy and environmental policy goals and the emergence of diverse supply and demand-side technologies, it has become apparent that closer collaboration among the energy agencies and alignment of these processes are needed. One outgrowth of collaboration was the establishment of the management level Joint Agency Steering Committee (JASC) to ensure regular communication on planning coordination. In addition, an inter-agency process alignment technical team was created as a forum for planning staff from the CEC, CPUC and CAISO to discuss technical issues and improve infrastructure planning coordination.

During 2013 the three agencies collaborated to better align the three processes in order to:

- Ensure that the various resource planning studies and related activities are based on consistent and up-to-date inputs;
- Establish clear expectations among the stakeholders and the agencies regarding the timing of flows of information, study results and other inputs between the processes;
- Maximize inter-agency collaboration in the development of key assumptions and study approaches; and, thereby
- Meet California's energy and environmental policy goals in a coordinated and effective manner.

In addition to aligning the three core processes, the agencies also agreed on an annual process to be performed in the fall of each year to develop planning assumptions and scenarios to be used in infrastructure planning activities in the coming year. The assumptions include demand, supply and system infrastructure elements, including the renewables portfolio standard (RPS) portfolios as a key assumption. As described in more detail below, the CPUC's annual process for developing planning

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1 SB 1389 (Bowen, Chapter 568, 2002) modified the planning responsibilities of the CEC and created the biennial IEPR.

2 AB 57 (Wright, Chapter 835, 2002) created PUC 454.5 shaping the procurement rights and responsibilities for the IOUs and the CPUC.

3 In addition to these three primary processes, there are other activities and formal proceedings that are relevant to electric infrastructure planning and procurement; some of these are identified later in this document. The energy agencies also collaborate as needed to conduct studies requested by other state agencies, such as the Air Resources Board and State Water Resources Control Board.

assumptions and scenarios includes a public workshop and an opportunity for written public comments on a draft version of these elements, prior to their formal adoption.[4]

This document and the accompanying process alignment diagram describe the alignment of the three key infrastructure planning processes that resulted from recent staff inter-agency collaboration, as well as the new annual process to develop planning assumptions and scenarios.[5] Implementation of the alignment described here was begun in the fall of 2013 and is currently being followed by the staff at the energy agencies for the 2015 IEPR cycle, the 2014-15 LTPP cycle, and the 2014-15 and 2015-16 TPP cycles.

Description of the IEPR-LTPP-TPP Alignment

The significant features of the process alignment are described below. It is suggested that the reader consult the accompanying process diagram while reading these descriptions.

1. The CEC's forecast of California energy demand

The IEPR demand forecast is an essential input to all infrastructure planning activities. The two-year IEPR cycle produces a long-term energy demand forecast at the end of each odd-numbered year; this much is consistent with previous IEPR cycles. A new feature is that the CEC will provide a limited demand forecast update at the end of each even-numbered year, based on updated economic and demographic forecasts. For the full biennial IEPR demand forecast, the CEC uses economic and demographic projections in a suite of models to forecast the underlying energy demand, and then makes adjustments to account for the impacts of significant demand modifiers, including energy efficiency, load-modifying demand response, customer-side distributed generation such as rooftop solar PV, etc. For the even-year demand forecast updates, however, the CEC will update only the economic and demographic projections used in its models, but will not undertake revisions to forecasts of demand modifiers. The accompanying process diagram indicates when and where the IEPR demand forecast enters as an input to the LTPP and TPP.

In addition, the CEC also provides its views of the remaining renewable net short (RNS) to satisfy the renewable portfolio standard (RPS) mandate, since this requirement is based on eligible energy sales, and projections of RNS require an in depth understanding of future energy demand.

2. The CPUC's Long-Term Procurement Plan (LTPP) proceeding

In December 2013, the CPUC issued an Order Instituting Rulemaking (OIR) establishing the 2014-15 LTPP cycle, consistent with the process alignment described here. The 2014 LTPP OIR is expected to be a two-year, two-phase process that begins in an even-numbered year and thus aligns with the regular IEPR cycle. The next LTPP cycle (i.e. the 2016 LTPP) would start in late 2015 and cover the 2016-17 period. Although each LTPP will have its focus on specific reliability issues, the expectation is that each LTPP will

[4] The CPUC has adopted the assumptions and scenarios via an Assigned Commissioner Ruling (ACR) for the past two planning cycles.

[5] It is the intent of the agencies to maintain the schedule depicted in the process alignment diagram as closely as possible. However, from time to time unavoidable schedule slippages or changes to priorities may occur. In such instances the agencies will work together to minimize any impacts.

have both a need assessment portion and procurement portion (either jointly or separately), described below as phase 1 and phase 2.[6]

a. LTPP phase 1 assesses needs for system, local and flexible capacity (generation or non-generation alternatives such as demand response), and it is expected to culminate in a CPUC decision on these needs in the first quarter (approximately February) of the second year of the cycle. During the first part of phase 1, up to about late August the CAISO will perform studies in accordance with the assumptions and scenarios developed by the three agencies, to assess needs for system, flexible and local capacity. The CAISO will provide the results of these studies as testimony to LTPP phase 1 to help inform the CPUC's decision on needs.

b. LTPP phase 2 determines how best to meet the needs identified in phase 1, and culminates in a CPUC decision authorizing any needed procurement at the end of the odd-numbered year of the cycle. The most recent CAISO transmission plan will be an input to phase 2 of LTPP so that approved transmission upgrades, if relevant to reduce the procurement needs, can be considered as part of how to meet the needs identified in LTPP phase 1.

3. The CAISO's transmission planning process

The TPP is an annual cycle that begins in January of each year and culminates in March of the next year with CAISO Board approval of the comprehensive transmission plan.

a. In TPP cycles that begin in an even-numbered year (e.g., 2014/15) the CAISO performs technical studies, using the final assumptions and scenarios adopted in the process described below as the starting point for developing the TPP assumptions and Study Plan[7] used to assess system and local resource needs. In parallel to but outside of the TPP itself, the CAISO performs additional studies in even-numbered years to assess the need for flexible resources. The results of all these studies feed into LTPP phase 1 to help inform the CPUC's assessment of needs. Also, in these TPP cycles, the transmission plan approved by the CAISO Board (e.g., in March 2015) feeds into the LTPP phase 2, so that approved transmission upgrades may offset some of the needs identified in LTPP phase 1.

b. In TPP cycles that begin in odd-numbered years (e.g., 2015/16) the CAISO performs mainly transmission-planning studies, rather than the full complement of studies that are usually performed for the LTPP phase 1 in even-numbered years. During odd-numbered years the CAISO will also assist the CPUC in LTPP phase 2 by assessing resource options proposed to meet the needs for flexible capacity.

4. Inter-agency collaboration to establish assumptions, study scenarios and resource portfolios

In the fall of each year the staff of the CEC, CPUC and CAISO will collaborate to develop draft assumptions and study scenarios to be utilized in the LTPP and TPP activities of the coming year. In the fourth quarter, the CPUC staff will issue draft assumptions and scenarios and schedule a workshop and

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[6] Each OIR will have its own Scoping Memo that defines the scope (including identification of phases or parts) and timing of the proceeding. The description herein is meant to be illustrative of the intent of this process alignment; future LTPP cycles may not need to incorporate separate phases.

[7] CAISO tariff section 24.3 specifies the process the CAISO must follow in developing the Unified Planning Assumptions and Study Plan in the first three months of each TPP cycle, including opportunities for stakeholder input (section 24.3.3). Assumptions and scenarios developed through the inter-agency process described in this document will inform the development of the CAISO's adopted TPP assumptions and scenarios to the extent feasible under the CAISO tariff.

opportunity for stakeholders to submit written comments. After reviewing the comments and making any necessary revisions to the draft assumptions, the final assumptions and scenarios will be issued. In the fall of 2013 the energy agency staff collaborated to develop draft assumptions and study scenarios to be considered for use in the CPUC's 2014-15 LTPP proceeding and the CAISO's 2014-15 TPP. The CPUC staff posted draft assumptions and scenarios and held a workshop in December 2013, and the LTPP Assigned Commissioner issued an Assigned Commissioner Ruling (ACR) adopting the final assumptions and scenarios in February 2014 to cover the 2014-15 planning processes.

One of the assumptions developed in each cycle is the RPS portfolio assumption (which may vary by scenario). The CPUC develops the "renewable portfolio standard" (RPS) resource portfolios to be used in the CAISO TPP to identify needs for public-policy transmission upgrades. The CPUC's RPS proceeding is currently examining the RPS Calculator and revising that tool so that it is better able to provide RPS portfolios as assumptions in this process.

The process to develop assumptions and scenarios will be performed annually, but the process will be somewhat different in odd-numbered and even-numbered years to reflect the fact that the LTPP and IEPR are biennial processes whereas the TPP is an annual process.

a. In the fall of an odd-numbered year, prior to the start of new IEPR and LTPP cycles, the agencies will develop complete assumptions, study scenarios and RPS portfolios for use in the LTPP phase 1 needs assessment process and the various studies performed under or in parallel to the CAISO's TPP.

b. In the fall of an even-numbered year, the agencies will provide more limited updates to the assumptions, mainly to ensure that the new TPP cycle has the most current information.

Study details and data needs

Each type of study requires its own set of information based on the purpose of the study. These include but are not limited to:

1. Load forecast and adjustments – additional achievable EE, behind-meter PV, CHP, storage, etc.
2. RPS portfolio calculation – the portfolio of existing and planned renewable generation for the forecast years
3. Renewable project information – size, capacity factor, technology and location of each of the renewable projects, both existing and new
4. Solar and wind hourly generation – production profiles by technology and location associated with each wind or solar project identified in a portfolio
5. Conventional supply resources – size and technology of existing and new additions of conventional generation resources
6. Other resources – including demand response (size and availability, event based and non-event based, including TOU rate impacts), storage, CHP, etc.
7. Outage rates – ambient, forced, and planned outage rates for each type of resource
8. Retirements – forecast retirements of generation based on characteristics, such as cooling mechanism or age

Local capacity and transmission planning studies need nodal level (or transmission busbar) assumptions for the above information. The CAISO tariff establishes a strict timing schedule, necessitating data

availability by January 1 to allow validation by February 1. The CAISO must then provide change files[8] to Participating Transmission Owners by March 1, which are then modeled in the powerflow base cases to be provided to the CAISO for final review by April 1. Other agencies need to adopt similar timing schedules.

In support of the data granularity requirements for local capacity and transmission planning studies, additional data translation tasks are required. Following the adoption of the biennial IEPR demand forecast or the even-year IEPR demand forecast update, IEPR results are translated into the level of geographic and temporal granularity needed for the various studies to be performed under the TPP. The main tasks comprising this process are:

1. Translate baseline peak demand/annual energy forecast into 8760 hourly loads for use in production cost modeling;
2. Extract customer side of the meter PV load reductions from baseline demand forecast; repeat step 1; use extracted PV assumptions with underlying PV production shape to develop aggregate customer side of the meter PV production profile; provide all results to CAISO for modeling purposes;
3. Translate additional achievable energy efficiency, rooftop PV, and other behind the meter impacts from service areas/climate zones to load busses for use by CAISO in power flow modeling;
4. Translate additional achievable energy efficiency, rooftop PV, and other behind the meter impacts from service area annual peak/annual energy into load shape impacts for use in economic analyses of congestion mitigation proposals;
5. All results of steps 1-4 should flow to the row TPP 2014/15 about January-February.

RPS portfolio calculation and renewable project information come mainly from a CPUC Energy Division tool called the RPS Calculator. Historically, development of RPS portfolios using the RPS Calculator has required significant collaboration between CEC and CPUC Energy Division staff.

The RPS Calculator is being overhauled within the RPS proceeding at the CPUC during 2014 and 2015. The outcome of that proceeding will inform the establishment of roles for the three energy agencies in developing RPS portfolios with the new RPS Calculator going forward. (See recent RPS Calculator ruling in the CPUC's RPS proceeding for more information.)

[8] A text file that is handled directly by modeling software that includes the changes to the transmission study assumptions based on the identified assumptions.

ATTACHMENT B

LTPP, TPP and IEPR Process Alignment for CPUC, CAISO and CEC

v. 3.8 – 4/18/14