Alignment of Key Infrastructure Planning Processes
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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

[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.