



CAISO proposal for local capacity use-limited resource characteristics

CPUC Workshop to Discuss Resource Adequacy Proposals

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Background

- “Slow response” resources are energy-limited resources, such as some demand response resources, that cannot be dispatched within 20 minutes following a contingency event and don’t have sufficient availability to be frequently dispatched.
- The CAISO cannot rely on such resources for local capacity requirements given need to timely reposition the system after a contingency event.
- In 2016, the CAISO and CPUC agreed to find a pathway for slow response resources to count towards meeting local capacity requirements.
- As part of that effort, CAISO conducted a transmission planning analysis in collaboration with participating transmission owners (PTOs).

October 2017 transmission planning analysis study assumptions

- At a joint CPUC-CAISO workshop in October 2017, CAISO presented its transmission planning analysis which:
 - Focused on outlining the reliability needs in the local capacity areas and how demand response programs could meet those needs if all technical, regulatory, and market barriers were removed.
 - Assessed the availability requirements for slow response resources to determine (1) annual, monthly and daily event hours; and (2) number of events per month, day and consecutive days.

October 2017 transmission planning analysis study assumptions (cont'd)

- The study assumed:
 1. Slow response resources would be dispatched in anticipation of loading conditions that would be problematic if contingencies occurred;
 2. No emergency declaration would be required for the CAISO to dispatch pre-contingency the slow response resources;
 3. The slow response resources are called last and therefore have the lightest possible duty;
 4. An idealized “perfect” forecast and dispatch capabilities; and
 5. Demand response capacity values would be constant throughout every hour of the year (not variable).

October 2017 transmission planning analysis methodology

- Step 1 is based on a load comparison while Step 2 is based on detailed engineering analysis:

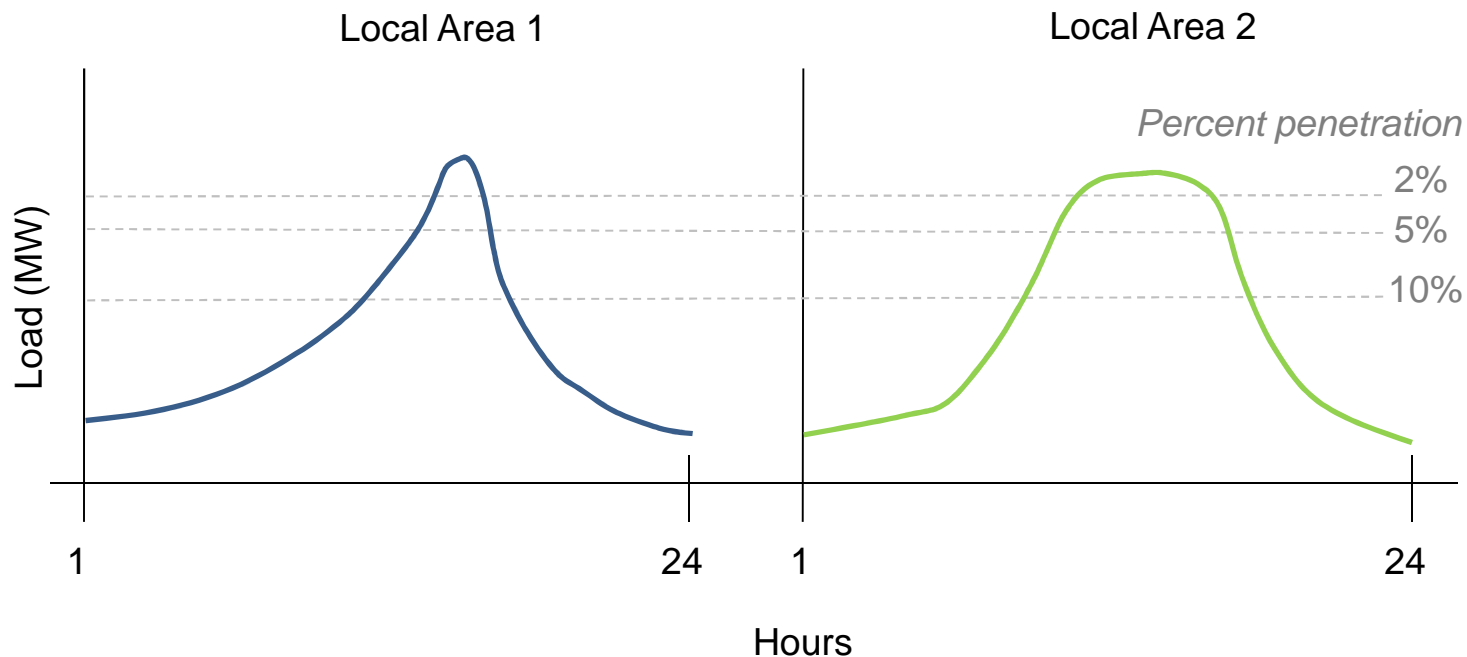
Study Sponsor	Areas Studied	Resource Amounts
SCE	- All LCAs, - All sub-areas	- Existing DR (Slow Response)
PG&E	- All LCAs,	- 2% of study area load
SDG&E	- San Diego subarea	- 5% of study area load - 10% of study area load
CAISO	- Voltage stability limited areas in southern California	- Existing DR (Slow Response) - 5% of study area load

Step 1

Step 2

Impact of treating resources as “light duty” on different load shapes

- Transmission planning analysis found daily duration hours were a limiting factor in some local and sub-areas



Numeric example from October 2017 Presentation

Slow response resource (MW) at different penetration levels compared to forecasted 2017 area peak load

Area (peak load, MW)	2%	2.1%	3.1%	5%	10%
El Nido (1,659)	33.2	34.3 <i>existing</i>	n/a	83.0	165.9
Western LA Basin (11,501)	230.0	n/a	354.9 <i>existing</i>	575.1	1,150.1

Notes: See October 2017 Presentation. Page 17 for area peak load; page 16 for all other information. Step 2 analysis only conducted on existing and 5%.

Slow response max event duration for forecasted 2017 load (hours)

Area	2%	2.1%	3.1%	5%	10%
El Nido	6	6 (6) <i>Existing</i>	n/a	7 (10)	11
Western LA Basin	3	n/a	4 (5) <i>existing</i>	5 (9)	9

Note: See October 2017 Presentation, page 21. 2017 forecasted hourly load profile derived from 3 years historical load profiles. Step 2 analysis only conducted on existing and 5%. Results for Step 2 are provided in parenthesis.

Transmission planning analysis uncovered two important developments

1. As the penetration of slow response resources increase, these resources will be relied upon more often, serving load during more hours and for longer durations; and
2. This analysis applies equally to all use-limited resources.

Local vs. system RA

- Based on feedback at joint CPUC-CAISO workshop and in written comments, slow response RDRR cannot be pre-dispatched because of settlement agreement provisions. Therefore:

System RA	Local RA
<ul style="list-style-type: none">• Slow response RDRR• Other system resources	<ul style="list-style-type: none">• Fast response RDRR• Fast response PDR• Slow response PDR*• Storage• Other use-limited resources• Non-use-limited resources

Use-limited resources

*CAISO stakeholder process for “pre-dispatch”

Existing use-limited resources in local and sub-areas

	[1]	[2]	[3]	[4]
Area	Existing slow response (MW)	Existing fast DR (MW)	Procured DR & Storage* (MW)	Total DR & Storage (MW)
El Nido	34	8	17	60
Western LA Basin	355	113	271	739

Notes: See October 2017 Presentation. Page 22. *Excludes hybrid gas/battery storage projects.

[1] This amount will be reduced by slow response RDRR capacity.

[2] Can count as local capacity.

[3] Procured DR amount will be reduced by slow response RDRR capacity.

[4] New total will be used to calculate the peak load penetration level.

CAISO has a 2020 and beyond 2020 proposal, starting with Track 1 approval for RA year 2020 changes

1. In Track 1 – CAISO proposes CPUC adopt CAISO’s methodology.
 - CAISO to conduct analysis in 2019 for 2020 RA year to identify the maximum level of use-limited capacity in each local capacity area and sub-area based on the CPUC’s existing four-hour minimum duration.
 - Adopting in Track 1 for 2020 allows for adequate opportunity to conduct appropriate procurement of needed technical and operational characteristics and CAISO market rule changes.

Track 1 proposed timing and activity establishing maximum use-limited local capacity in local areas

- Compare

Time	Activity
Q2 2018	<ul style="list-style-type: none">• CPUC adopts CAISO methodology for• establishing maximum use-limited capacity in• local capacity areas
Q4 2018	<ul style="list-style-type: none">• CAISO works with PTOs to set up the analysis• and compile necessary data
Q1 2019	<ul style="list-style-type: none">• Single forecast set is adopted by the CEC• Unified Inputs & Assumptions document is transmitted to CAISO• CAISO performs analysis and conducts stakeholder process
Q2 2019	<ul style="list-style-type: none">• CAISO submits analysis into the CPUC's resource adequacy proceeding with the Local Capacity Technical Study for the 2020 compliance year

Beyond 2020, CAISO to refine analysis to provide more flexibility

1. In Track 2 – CAISO proposes CPUC develop a framework to accommodate an increasing amount of use-limited resources being used to meet local capacity requirements.
 - Each local area has unique needs based on load profiles, the amount of use-limited resources in the area, and the operational characteristics of existing resources.
 - CAISO will continue to refine its transmission planning analysis to help the CPUC balance policy implications of increased penetration and complexity of the RA program.
 - CAISO analysis will provide an early indication of changing local reliability conditions.

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