

Day-ahead Summer Report information

This document is intended to provide an explanation of the Day-ahead Summer Report.

The day-ahead market produces a solution that relies on scheduling supply to meet CAISO load forecast for CAISO area. All capacity made available in the day-ahead market is assessed to meet the load forecast, taking into account outages, derates, system and resources constraints. It also considers day-ahead forecast for renewable resource production. Since CAISO system has to meet reliability requirements for operating reserves, the capacity scheduled to meet such obligations is set aside in the process to determine the optimal schedules for energy.

The day-ahead forecast is an input to the market and represented with the column labeled as “DA Forecast”. This forecast is used only in the Residual unit commitment process (RUC) and sometimes it may be interchangeably named as the RUC forecast. The column “DA Net load forecast” is the net load estimated by subtracting the renewable day-ahead forecast from the DA forecast and reflects the level of load that needs to be met with other supply. The column “DA forecast plus reserves” is the total load obligation for CAISO to meet and consists of both load forecast and operating reserves, which typically are about 6% of the load.

Since the day-ahead market is run one day in advance, the markets have to rely on forecast for load and renewable resources. DA forecast will inherently have a certain degree of inaccuracy, which can be measured by typical metrics for load accuracy errors. Generally, load forecast errors can be in a range of 2-3%; however, there can be weather conditions that result in atypical large errors, or inaccuracies. The load forecasts will carry more uncertainty the farther they are from the actual time since they will depend more on weather variables such as temperatures. If there are large temperature errors in the day-ahead timeframe, naturally these errors will be inherited in the load forecast errors. Therefore, there is always a level of uncertainty for the load forecast used in the markets. Depending on the magnitude of these uncertainties, there may be greater implications to the efficient operation of the system in real time. For instance, if the day-ahead market resulted in loads much lower than what actually materializes in real time, the day-ahead may not commit sufficient resources in advance and may create a risk for the reliable operation of the system in real-time, which inherently runs in a shorter time window to commit some resources. There are also other operational uncertainties to consider, such as impacts of fires during drought conditions. All these factors require having some level of consideration for uncertainty. Over the last two years, CAISO has been estimating what is called an upper confidence band for load forecast, which is a rough estimate of extreme weather conditions for similar conditions to the day being forecasted. This provides a reference for operators to gauge how much higher the load could actually materialize above the load forecast. This input as well as other operational considerations may be used to determine an upper adjustment that can be put to the DA load forecast. This is referred as “RUC forecast adjustment”. A value of 2,000 MW means there will be an increase of 2,000 MW to the load forecast in the selected hour. Effectively the total of the day-ahead forecast plus the RUC adjustment is what is utilized in the day-ahead market to clear the needed supply in the RUC process.

When there is not sufficient supply to meet the total load forecast plus RUC adjustment, the market will produce a solution that will be infeasible to meet demand with supply; the amount of infeasibility is what is called “RUC shortfall with Forecast Adjust”. It is measured against the load forecast plus RUC adjustment, because it considers the extreme case in which the uncertainty may materialize in real-time.

Therefore, it's the first signal of potential supply shortfall that CAISO may have in the day-ahead timeframe. This supply shortfall will internalize all resources and system conditions and is the best representation of how potentially the system is positioned for real time. It is, therefore, the first opportunity for operators to realize if other actions may be needed to mitigate for this projected shortfall. The following screenshot provides a reference to the daily report generated during the summer timeframe and shows the columns described in this document.

Day-Ahead System Summary								
Hour	DA Forecast	DA Net Load Forecast	DA Forecast plus Reserves	RUC Forecast Adjustment	RUC Shortfall with Forecast Adjust ²	RUC Shortfall	RUC Self-Sched (PTK) Export Reduction	
1	27,932	24,579	29,657	0	0	0	0	0
2	26,432	23,252	28,057	0	0	0	0	0
3	25,332	22,403	26,887	0	0	0	0	0
4	24,684	22,034	26,198	0	0	0	0	0
5	24,719	22,305	26,235	0	0	0	0	0
6	25,649	23,649	27,224	0	0	0	0	0
7	27,115	25,250	28,782	0	0	0	0	0
8	28,124	23,165	29,856	0	0	0	0	0
9	28,885	19,270	30,669	0	0	0	0	0
10	29,479	17,910	31,297	0	0	0	0	0
11	30,419	17,945	32,296	751	0	0	0	0
12	31,829	19,000	33,794	815	0	0	0	0
13	33,679	20,802	35,760	1,684	0	0	0	0
14	36,012	23,088	38,239	2,293	0	0	0	0
15	38,147	25,524	40,513	2,116	0	0	0	0
16	40,007	27,963	42,497	2,000	0	0	0	0
17	41,384	30,367	43,961	2,069	0	0	0	0
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