2020 Summer Loads and Resources Assessment results

Bob Emmert
Sr. Manager, Interconnection Resources

Board of Governors Meeting
General Session
July 22, 2020
Summer Assessment 2020

- The Summer Assessment process uses a production simulation model that runs 2,000 simulations of varying levels of weather driven load and renewable generation.

- Report for 2020 represents results from 2 cases.
  1. Base case: import limit set to capture most historical import levels.
  2. Moderate sensitivity case: import limit set more conservative levels.

- 2020 load forecast relatively unchanged from 2019.

- CA hydro conditions are below normal – close to 2018 conditions.
  - Snowpack peaked at 63% of average, reservoirs at 101% of average.
  - The Northwest hydro reservoirs projected to be 95% of average.

- Generation additions minus retirements equals 1,432 MW.
  - Effective load carrying capability increase for September is 38 MW.
General Conclusions

• ISO projects overall adequate supply despite a low hydro year.
  – Resource adequacy levels are similar to the summer of 2018.
  – Tight supply conditions are more likely to occur in late summer when hydropower declines to its summer low levels, particularly in September when solar decreases as well.

• Rooftop solar continues to offset load growth and has pushed the system peak to evening hours when solar is no longer available.

• Reliance on imports increases during the late summer when the impacts of below-normal hydro conditions will be more pronounced.
Impacts to loads due to COVID-19

• Too many unknowns exist to produce a viable and meaningful COVID-19 load impact scenario.

• The ISO has experienced load reductions of 5 to 8 percent on weekdays, and 1 to 4 percent on weekends, with the largest reductions occurring over the morning peak hours.

• 2020 summer air conditioning loads have started materialize and to date show no decrease in evening peak demands.

• While the ISO does recognize there are likely to be lasting effects from COVID-19 throughout the 2020 summer period, there is not enough data to forecast the magnitude and hourly profile of those impacts.
On-peak net import cap nomograms for base case and conservative imports sensitivity
Import limit impacts the probability of a system capacity shortfall

Probability of ISO system capacity shortfall

<table>
<thead>
<tr>
<th>Result</th>
<th>Base Case</th>
<th>Sensitivity Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 2</td>
<td>3.7%</td>
<td>10.6%</td>
</tr>
<tr>
<td>Stage 3</td>
<td>1.1%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Unserved energy</td>
<td>0.2%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>
Base case: minimum unloaded capacity margins

Stage 1 Emergency range
Stage 2 Emergency range
Stage 3 Emergency range

Minimum Unloaded Capacity Margin

1 Stage 1 range is approximate

California ISO
Conservative import sensitivity: minimum unloaded capacity margins

1 Stage 1 range is approximate
Base case demonstrates highest risk when solar is unavailable

![Graph showing solar generation and minimum unloaded capacity margin (MUCM) occurrences over time.](image)

- **Time**:
  - 6:00 to 22:00

- **Solar generation**:
  - Peak around 12:00

- **Minimum Unloaded Capacity Margin (MUCM)**:
  - Occurrences:
    - 6:00: 1
    - 7:00: 17
    - 8:00: 66
    - 9:00: 77
    - 10:00: 18
    - 11:00: 262
    - 12:00: 1388
    - 13:00: 171
    - 14:00: 1

- **ISO Solar generation**:
  - Variations throughout the day, with a peak around 12:00.
Conservative case confirms highest risk when solar is unavailable

![Graph showing solar generation and minimum unloaded capacity margin over time, with peak risk occurring at 20:00 (8 PM) with 1401 occurrences.](image-url)
Conclusions

• Compared to our projections in 2019, this summer poses somewhat increased risk of conditions that could result in operating reserve shortfalls.

• Overall, adequacy levels are similar to the summer of 2018, with similar hydro conditions.
  – Adequate imports may be critical in late summer when the impacts of below-normal hydro conditions are more pronounced.
  – A late summer heat wave, especially if wide spread and impacting imports, would be particularly challenging.

• Adequacy levels are most challenged in the post-solar window, as reductions in the gas fleet have not yet been offset by sufficient storage to offset the loss of capacity available in that window.