2021 Summer Loads and Resources Assessment results

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2021 Summer Assessment

- The Summer Assessment process uses a production simulation model that runs 2,000 simulations based on historical renewable generation profiles and a range of load levels derived from 26 years of weather history
- Two simulation cases were studied:
  1. Base case: Import limit set to capture most historical import levels
  2. Sensitivity case: Monthly import limits set to the 6-year average of the resource adequacy imports procured for each summer month
- The simulations assess the risk of needing to call on extraordinary measures to reduce load that can be accessed under emergency or extreme conditions – those measures are not included in the simulations
- The 2021 report also presents results of a deterministic "stack analysis" of September 2021

2021 Summer Assessment key points

- The ISO anticipates supply conditions in 2021 to be better than 2020
  - Potential challenges can arise if an extreme heatwave affects a substantial portion of the West, reducing the availability of imports into the ISO
- Supply conditions are improved over 2020 with roughly 2,000 MW of new resources, plus an additional 1,000-1,500 MW of other expedited procurement not included in the simulations
  - However, we are in the second year of significantly lower than normal hydro conditions
- Load forecast: 1-in-2 relatively unchanged from 2020 (45,835 MW)
  - However, 1-in-10 loads are significantly higher

<u>Summer 2020</u>
Compared to a 1-in-2 forecast:
- 1-in-5 was 4% higher
- 1-in-10 was 6% higher

<u>Summer 2021</u>
Compared to a 1-in-2 forecast:
- 1-in-5 remains 4% higher
- **1-in-10 is 11% higher**

  - Adding last year's extreme weather events to the historical weather database results in an extreme summer heat event now within the range of a 1-in-10 weather event

Stochastic Modeling Results

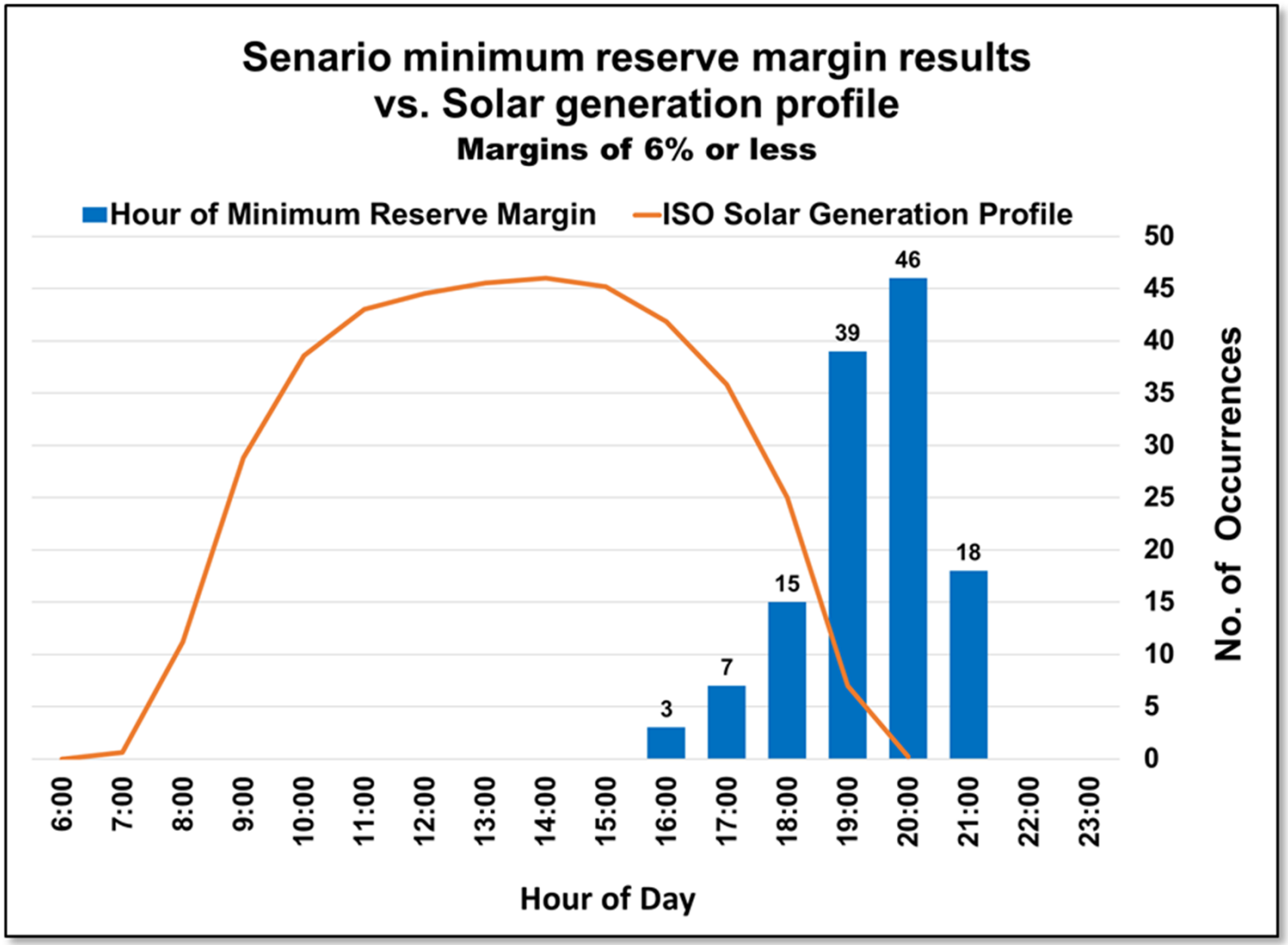
- Results are improved over 2020, but the conservative net import sensitivity study shows reduced levels of net imports during high demand conditions significantly affects system reliability

Probability of ISO system capacity shortfall

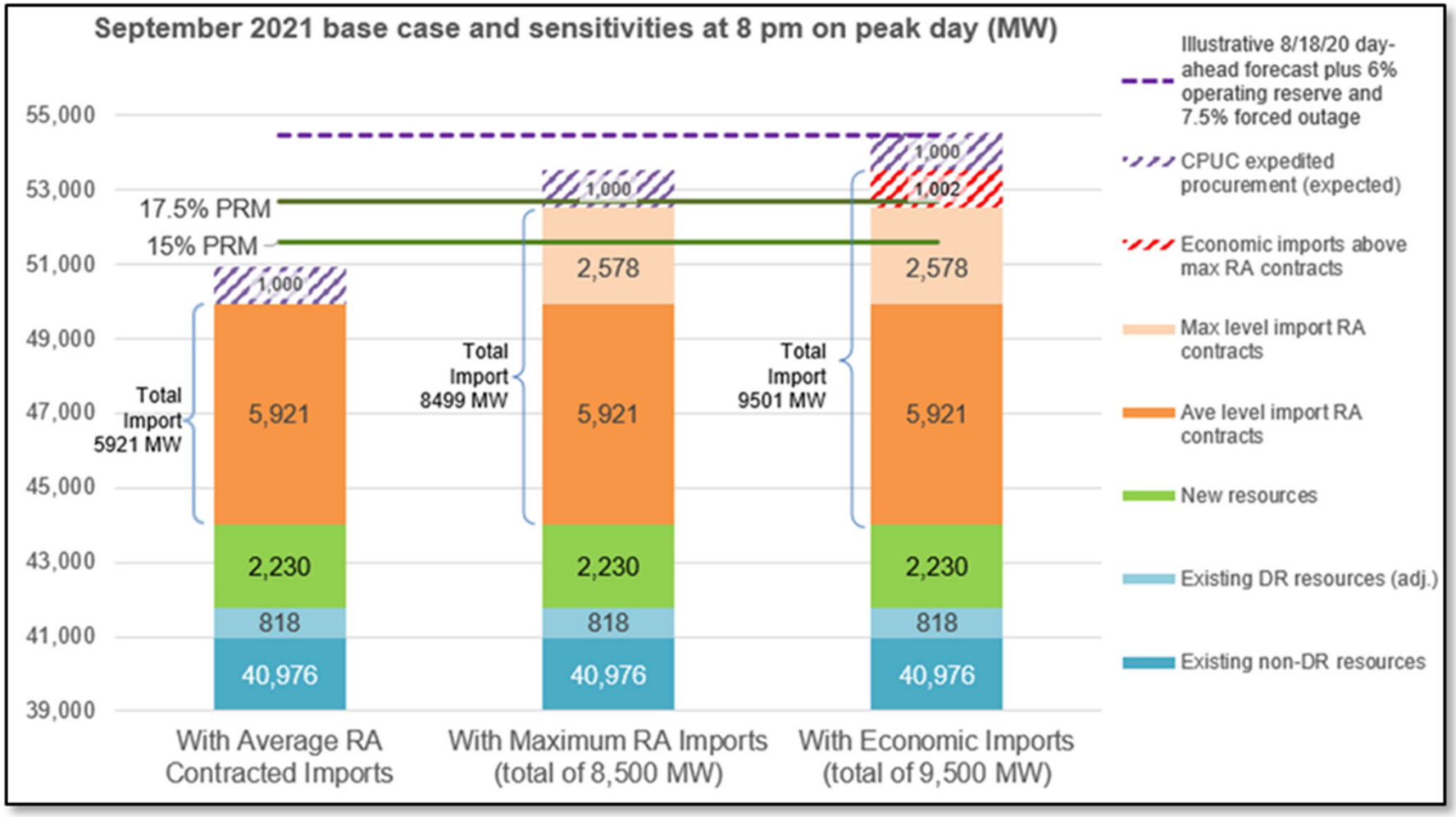
Result	Base Case	Sensitivity Case
Stage 2	6.4%	14.1%
Stage 3	4.8%	12.5%
Unserved energy	4.6%	12.4%

  - 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

Base case demonstrates risk is highest when solar is unavailable



Stack analysis further demonstrates reliance on imports during September



Conclusions

- Overall, capacity conditions are better compared to 2020
  - but the grid remains vulnerable to high loads and availability of imports during widespread heat events,
  - Low hydro conditions increase risk, particularly in late summer
- Added storage and retaining 400 MW of generation through the reliability must-run process improves expected performance for 2021
  - Projected new storage additions expected to be effective at supporting system capacity needs during post solar hours
- The distribution of probabilistic results based on historical weather now reflect last year's conditions
  - As a result, 1-in-10 conditions now reflects higher load patterns than in past years' studies
- Improved awareness, communication, market tools and development of contingencies measures will help to increase system reliability if extreme conditions arise