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California ISO

# 2021 Preliminary Summer Assessment Results

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# ISO's Summer Assessment is an operational-based analysis focused on preparing for normal and a range of potential extreme conditions

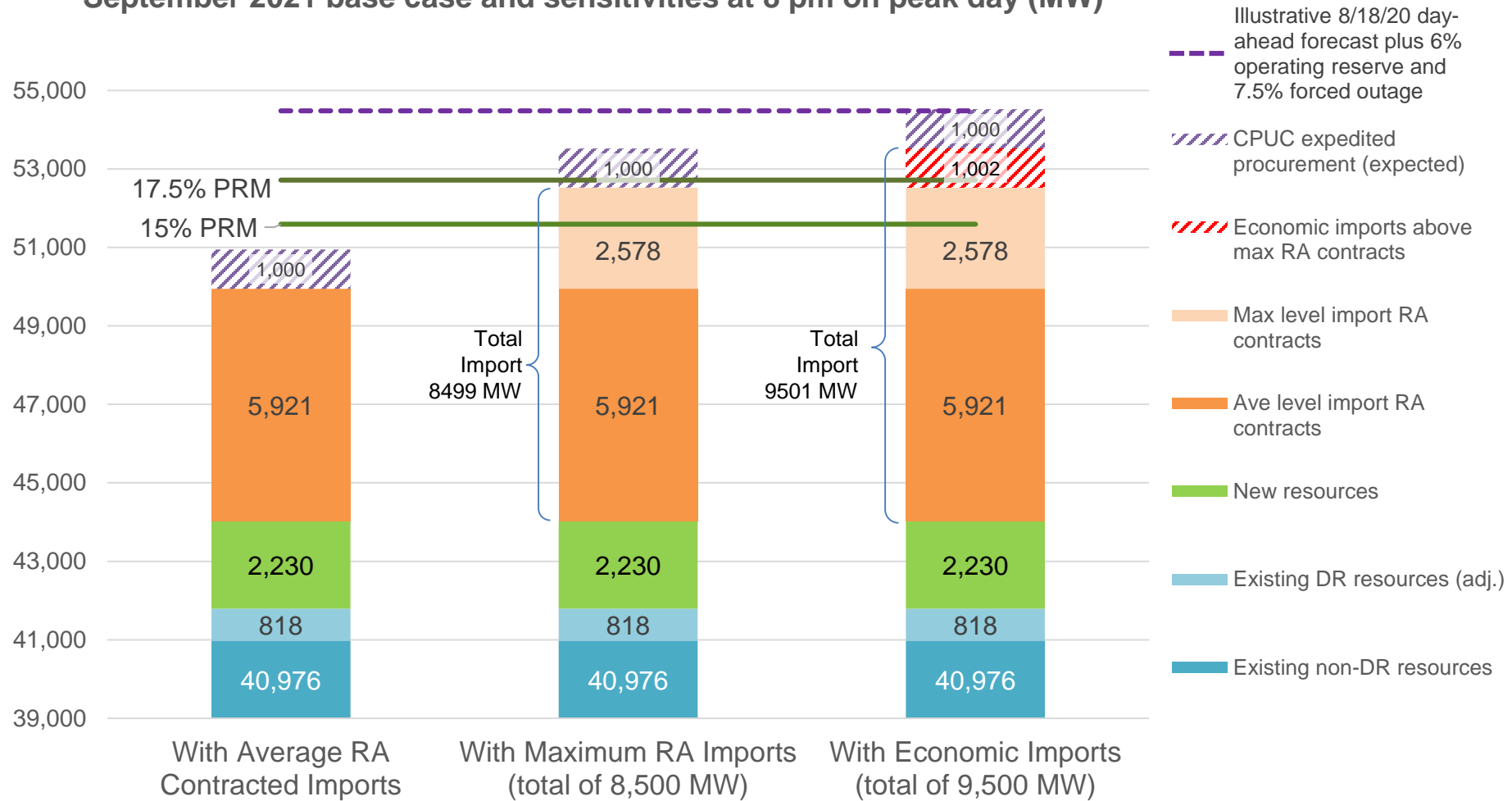
## 2021 assessment used a layered approach

Deterministic assessment of resources (stack analysis)	Stochastic Production Cost Model analysis
Uses the CEC 2020 IEPR 1-in-2 forecast for 2021	Uses the ISO developed range of weather driven load forecasts for 2021
Based on resource RA Net Qualifying Capacities	Based on resource RA Net Qualifying Capacities
Solar considered at zero output at post-solar window (8 pm)	Model all hours of the day across the summer
"Effective Load Carrying Capability" base values used for hydro and wind	Generation profiles for renewables, and combination of dispatchability and profiles for hydro
Demand response discounted 50% (reflecting 2020 actual performance of "shown" capacity)	Market based DR not discounted

# 1. California ISO “stack analysis” for summer 2021

(with PRM levels based on CEC 1-in-2 load forecast plus planning reserve margin)

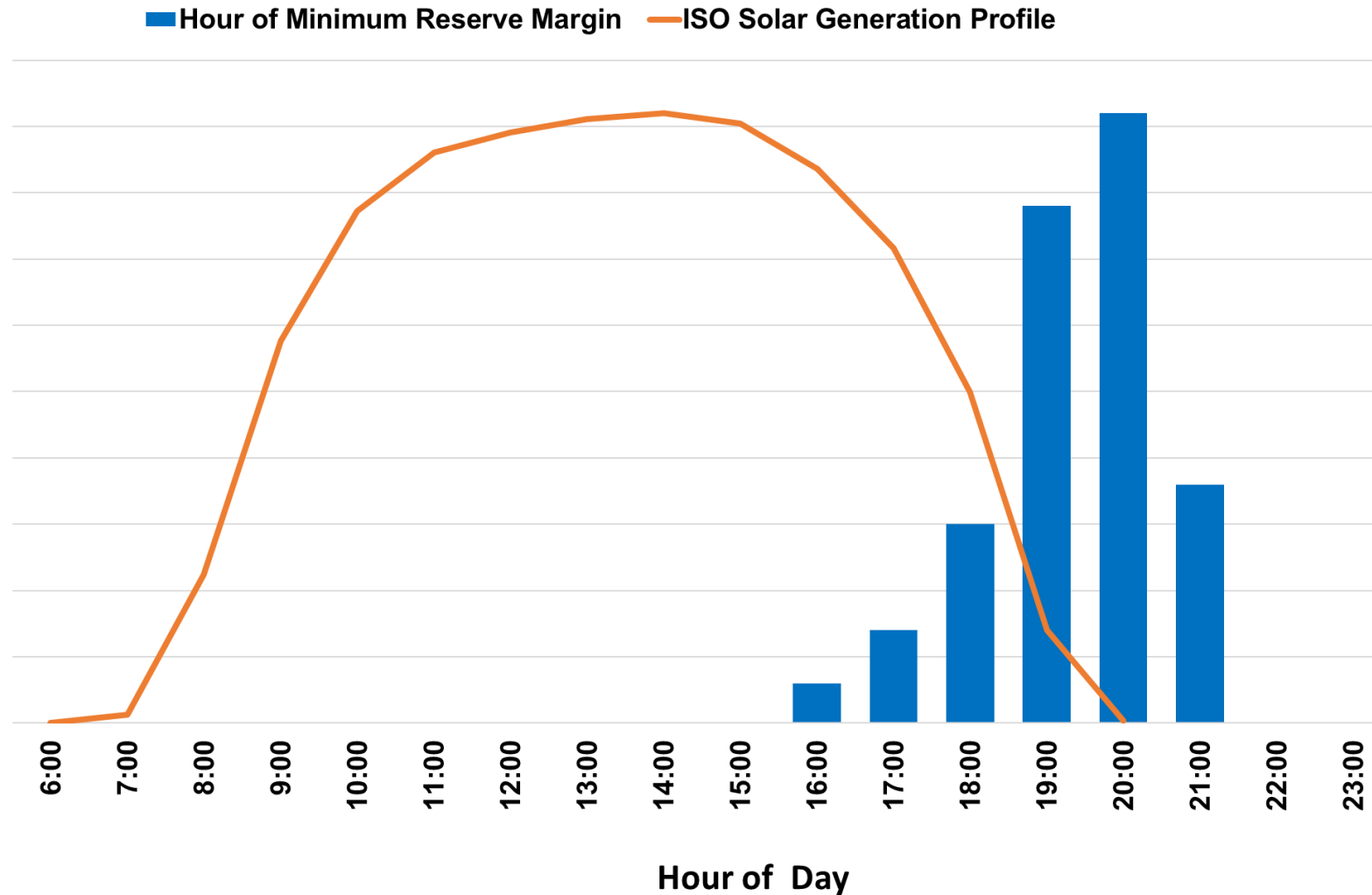
September 2021 base case and sensitivities at 8 pm on peak day (MW)



## 2. Preliminary Stochastic 2021 Summer Assessment

- Probability of Stage 2 alert is lower than in 2020
  - Somewhat lower under typical import levels
  - Significantly lower under conditions of limited imports
- Probability of Stage 3 alert is lower than in 2020
  - Essentially unchanged under typical import levels
  - Probability has decreased, but under conditions of limited imports only marginally better than Stage 2
- Conditions impacting the 2021 results:
  - New resources coming into operation
  - Similar low hydro conditions
  - Virtually unchanged 1-in-2 load level
  - Incorporating last year's actual weather events into the determination of how much a 1-in-10 load level exceeds an average 1-in 2 condition
- The results demonstrate increased reliability under most conditions, but last year's weather events are now considered “more probable”

# Hours of greatest risk in samples with reserve deficiencies distribution of samples showing reserves at 6% or less (Stage 2 emergency)



## Comparison of conditions

- Approximately 2,200 MW additional available capacity – consistent with the stack analysis
- Hydro: About 5% lower snowpack than 2020 – around 60% of average conditions – similar to 2013 hydro generation profile, 2020 was similar to 2018 profile
- Very little difference (70 MW) in 2020 1-in-2 peak demand and 2021 1-in-2 peak demand (approximately 45,900 MW)
  - ISO forecast trends about 1% higher than CEC forecast for 1-in-2 load conditions.

### Summer 2020

Compared to a 1-in-2 forecast:

- 1-in-5 is 4% higher
- 1-in-10 is 6% higher

### Summer 2021

Compared to a 1-in-2 forecast:

- 1-in-5 remains 4% higher
- **1-in-10 is 11% higher**

- Higher loads associated with a 1-in-10 are attributable to including last year's weather events in the stochastic analysis

## Overall conclusions

- Overall capacity conditions are better compared to 2020 but grid remains vulnerable to high loads and availability of imports during widespread heat events, especially with significantly below average hydro conditions
- Retaining gas-fired generation and added storage improve expected performance for 2021
- Storage is expected to be effective at supporting system capacity needs when added to the existing fleet
- Probabilistic measures based on historical performance now reflect last year's conditions; as a result a "1-in-10" condition now reflects higher load pattern than in past years' studies.