

# Renewable Integration Update

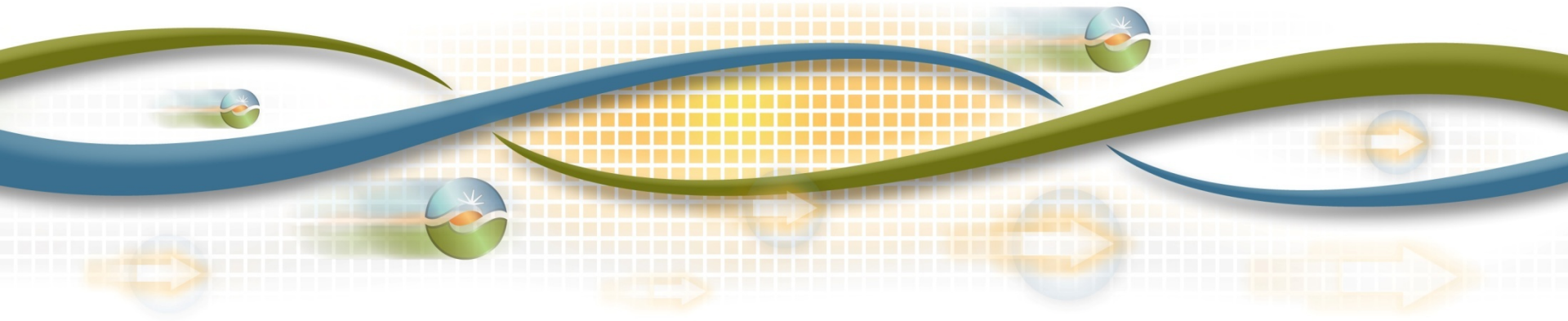
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General Session

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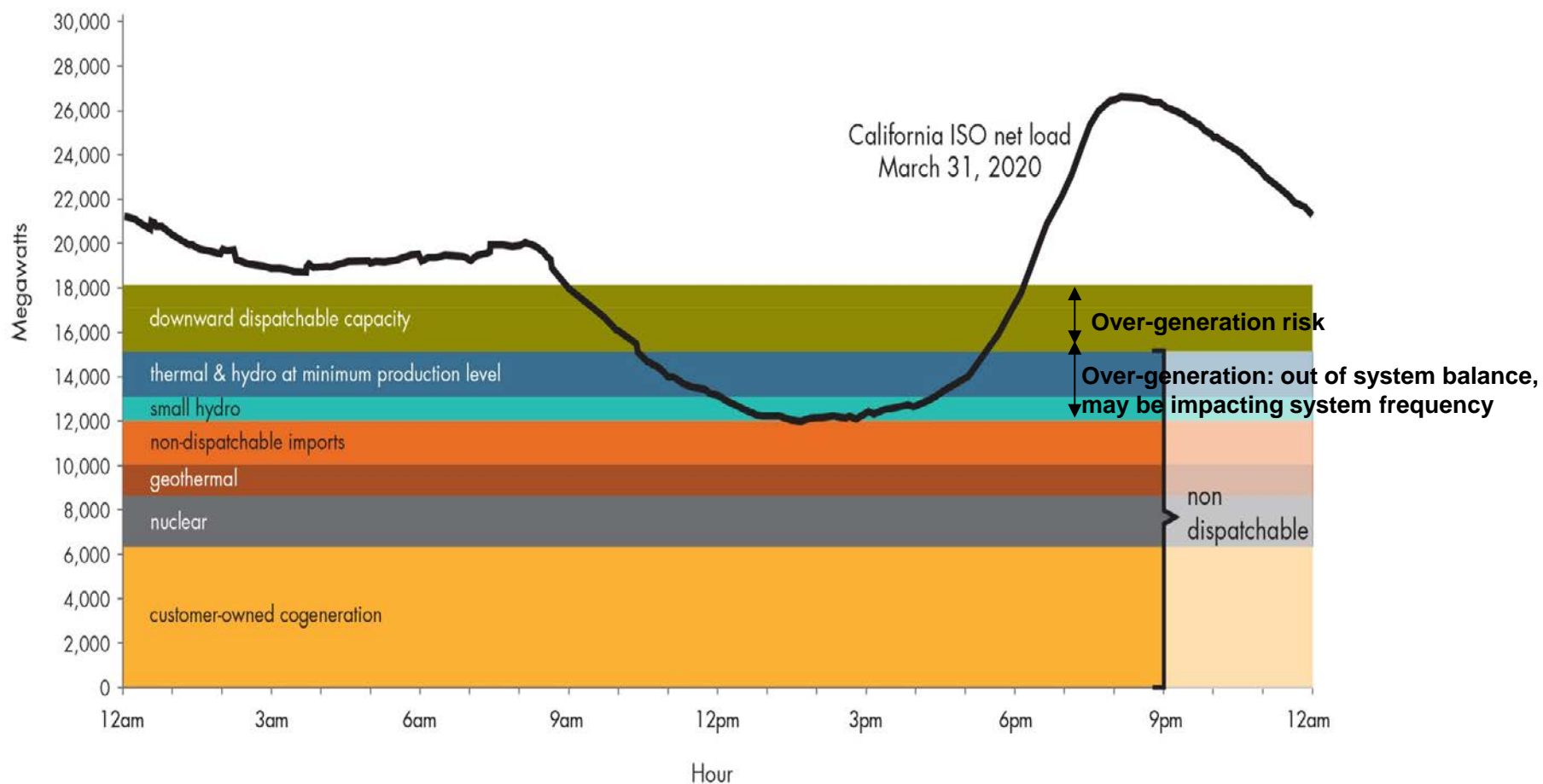




The ISO is in the beginning phase to tracking key operating conditions to ensure continued reliability.

- Markets
  - Operationally and cost-effective resource mix
  - System flexibility
  - Price trends
- NERC Control Performance Standards
  - Supply/demand balance
  - System recovery following disturbances
  - System frequency response

The ISO has over-generation risk as a result of limited available downward dispatchable capacity and low minimum net load.



Using the net load curve assumes that renewable generation is non-dispatchable  
Also looking at load curve with renewables shown as a non-dispatchable resources in stack

The ISO continues to perform studies to understand future grid operating needs and support planning and procurement.

- **Resource Adequacy studies**
  - Multi-hour and intra-hour flexible capacity needs of the system
  - Intra 5-minute dispatch regulation needs
- **Long Term Procurement Planning studies**
  - Adequacy of capacity and flexibility for daily operation under various renewable assumptions
  - Identify potential over-generation conditions
  - Identify potential hours of unserved energy
- **Additional technical studies**
  - Interconnection requirements
  - Operational requirements to meet control performance standards

In addition to studies, the ISO is taking a number of actions to provide visibility of system flexibility needs and increase flexible resource in the market.

- Operating tools provide visibility of needs
  - Ramp requirements tool
  - Regulation prediction tool
  - Increase granularity of real-time forecasting
  - Behind the meter solar forecasting
- Policy promotes flexible resource availability and participation
  - Flexible RA requirements
  - Lower bid floor
  - Pay for performance regulation
  - Intra-hour scheduling (FERC 764)
  - Flexible ramping product
  - Energy Imbalance Market
  - Dynamic transfers