



Overview of OTC Plant Roles in Assuring Electric System Reliability

California Energy Commission
IEPR OTC Workshop

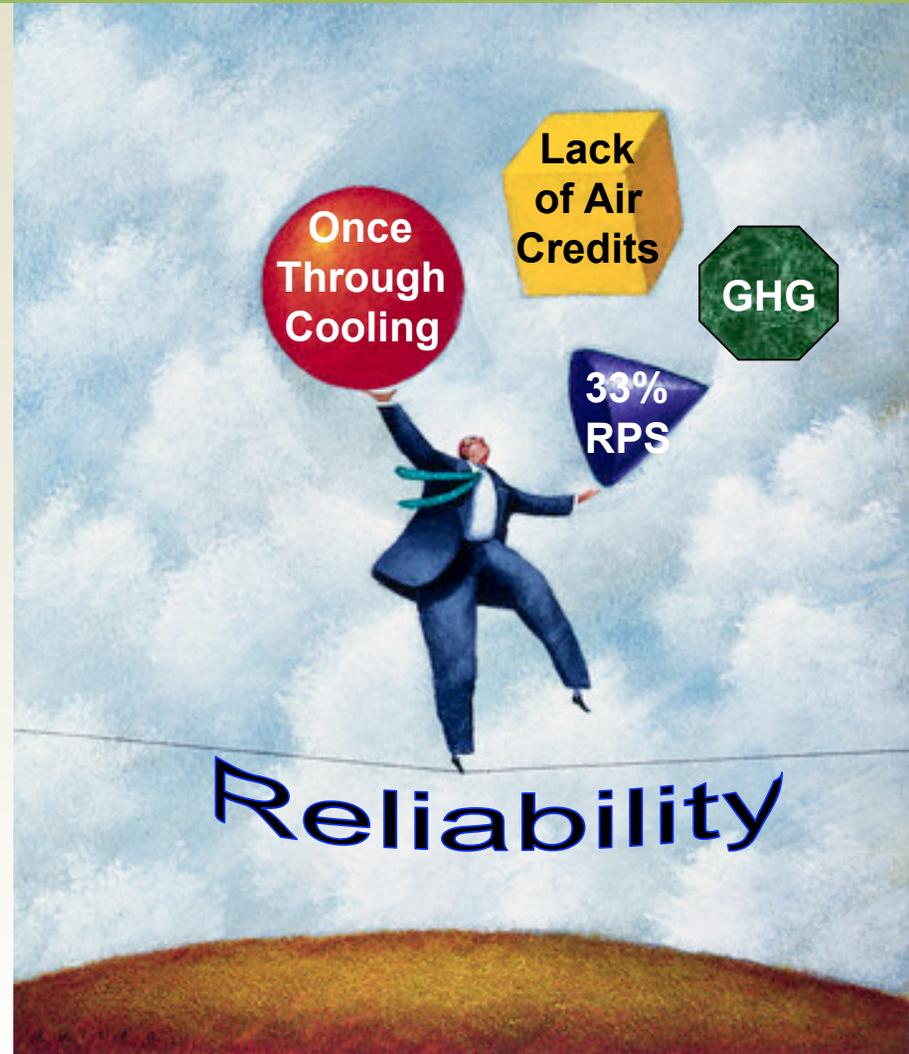
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Into the Future

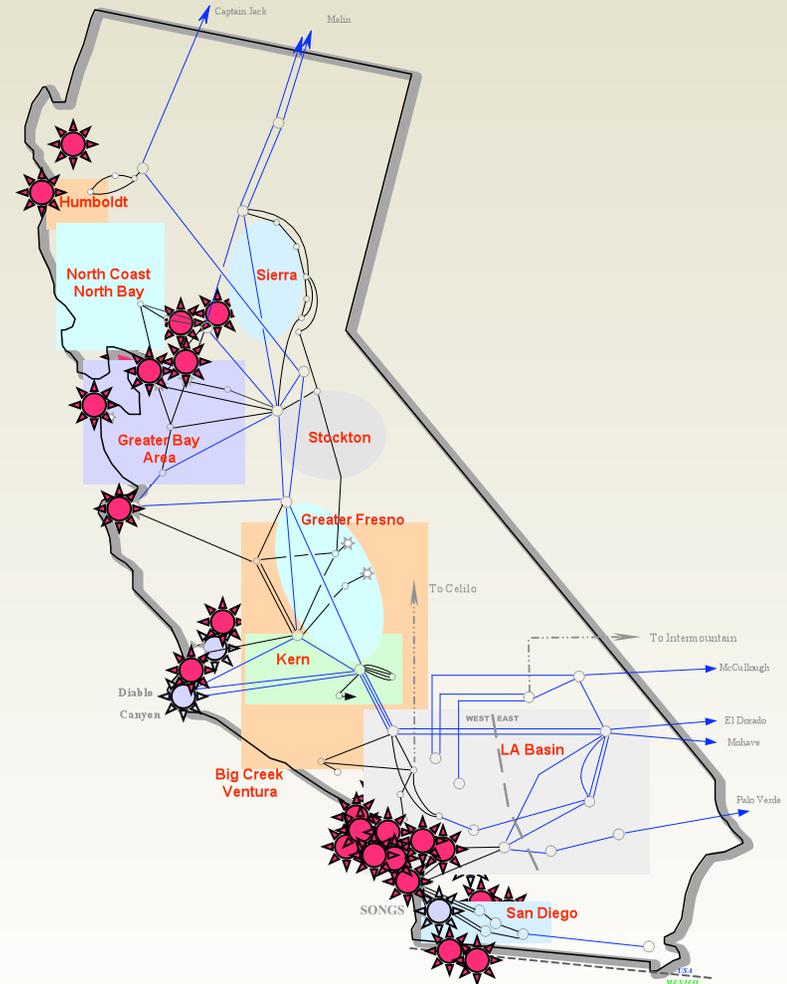
Accommodating the Climate Change Initiatives

The ISO's primary objective is to maintain electric grid reliability in compliance with federal standards while meeting the state's environmental goals.

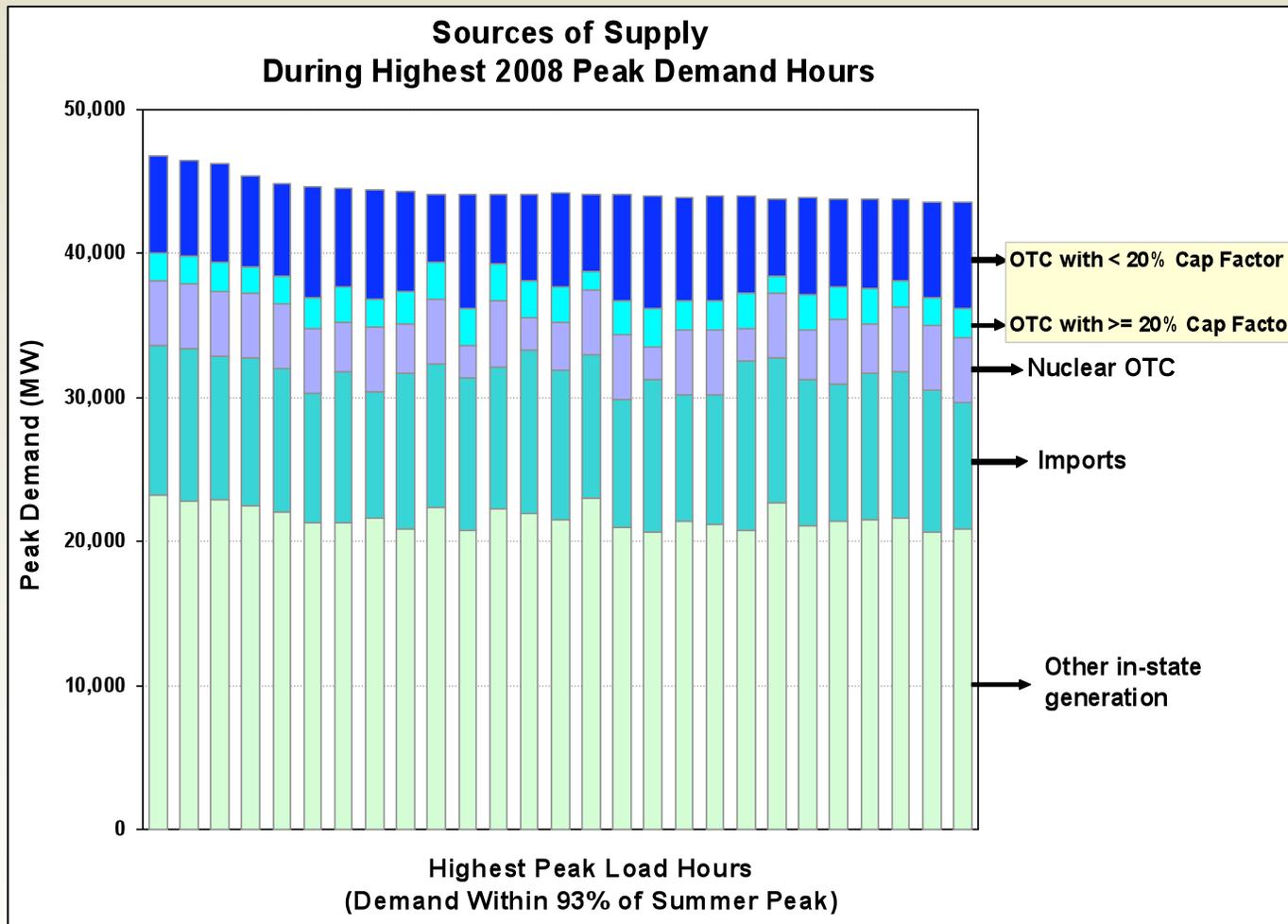


Existing coastal plants are essential for local reliability and renewables integration.

- Once Through Cooled Generation
 - Represents significant amount of in-state generation
- Needed for
 - Meeting System Demand
 - Local Reliability
 - Essential to Renewable Integration
 - Ramping
 - Regulation
 - Load Following



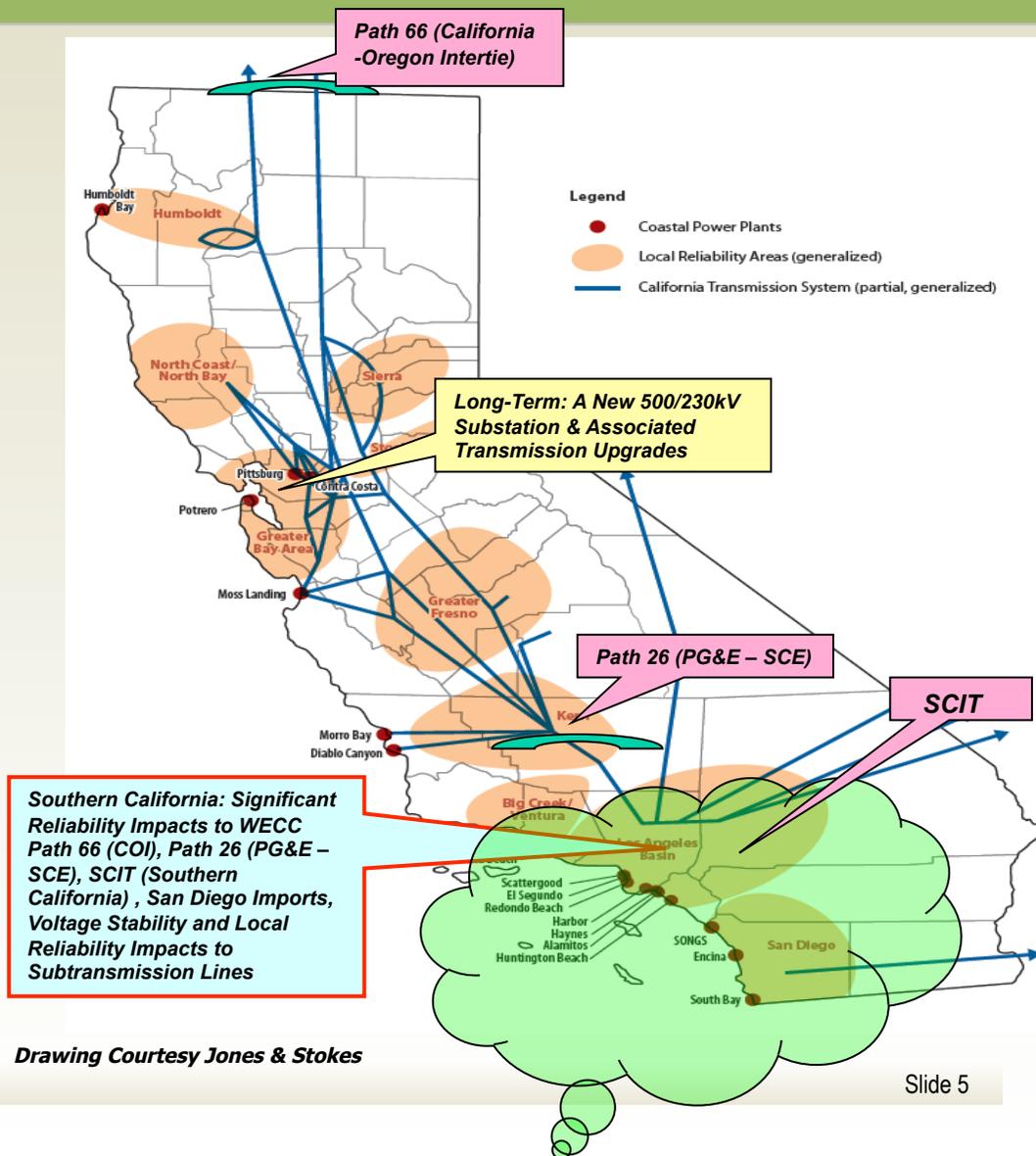
Non-nuclear OTC plants contributed greater than 25% of supply to meet 2008 peak demand.



Approximately \$5 billion in high-level transmission upgrades could be needed in addition to replacement power in the absence of non-nuclear OTC Plants within the ISO.

- 5 Local Capacity Reliability(LCR) Areas have OTC plants
- Significant reliability impacts
- Lengthy process to approve transmission

LCR = Minimum capacity requirement to maintain national and regional reliability criteria.



Drawing Courtesy Jones & Stokes

OTC Plants Role in Renewable Integration

- ISO *Integration of Renewable Resources* report – November 2007
 - Identified need for additional Ancillary Services, including regulation and intra-hour load following to meet the state's 20% Renewables Portfolio Standard (RPS)
 - Non-nuclear OTC plants currently provide these services
 - Replacement generation needs to have similar operating characteristics as the existing OTC plants
 - The ISO is currently studying what will be needed to support the integration of a 33% RPS
 - It is clear that more fossil-fired generation will be needed to provide additional Ancillary Services to support 33% RPS integration

Considerations In Moving Forward...

1. Retrofitting, re-powering or otherwise replacing some existing plants in the same areas
2. Identifying transmission upgrades as needed to maintain grid reliability
3. Coordinating with the Nuclear Regulatory Commission (NRC) oversight of cooling retrofits to nuclear units
4. Coordinating OTC implementation plans with other environmental initiatives (green house gas, renewables integration) to maintain grid reliability