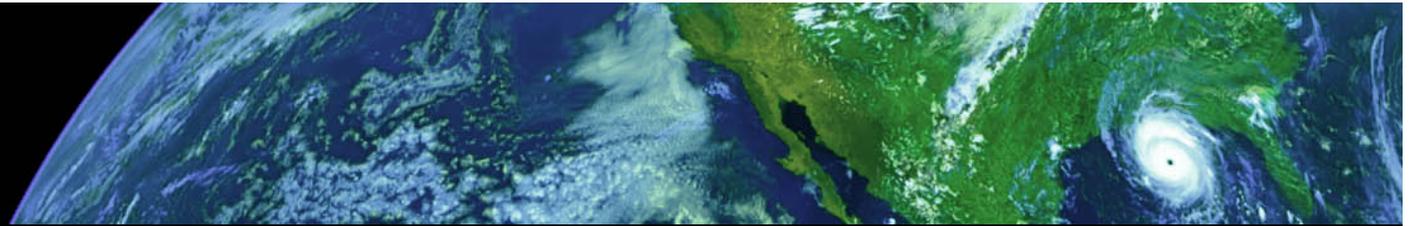


CEERT



Pulling the Pieces Together:
Thinking Regionally and Cooperatively

Stanford University
January 13, 2011

V. John White



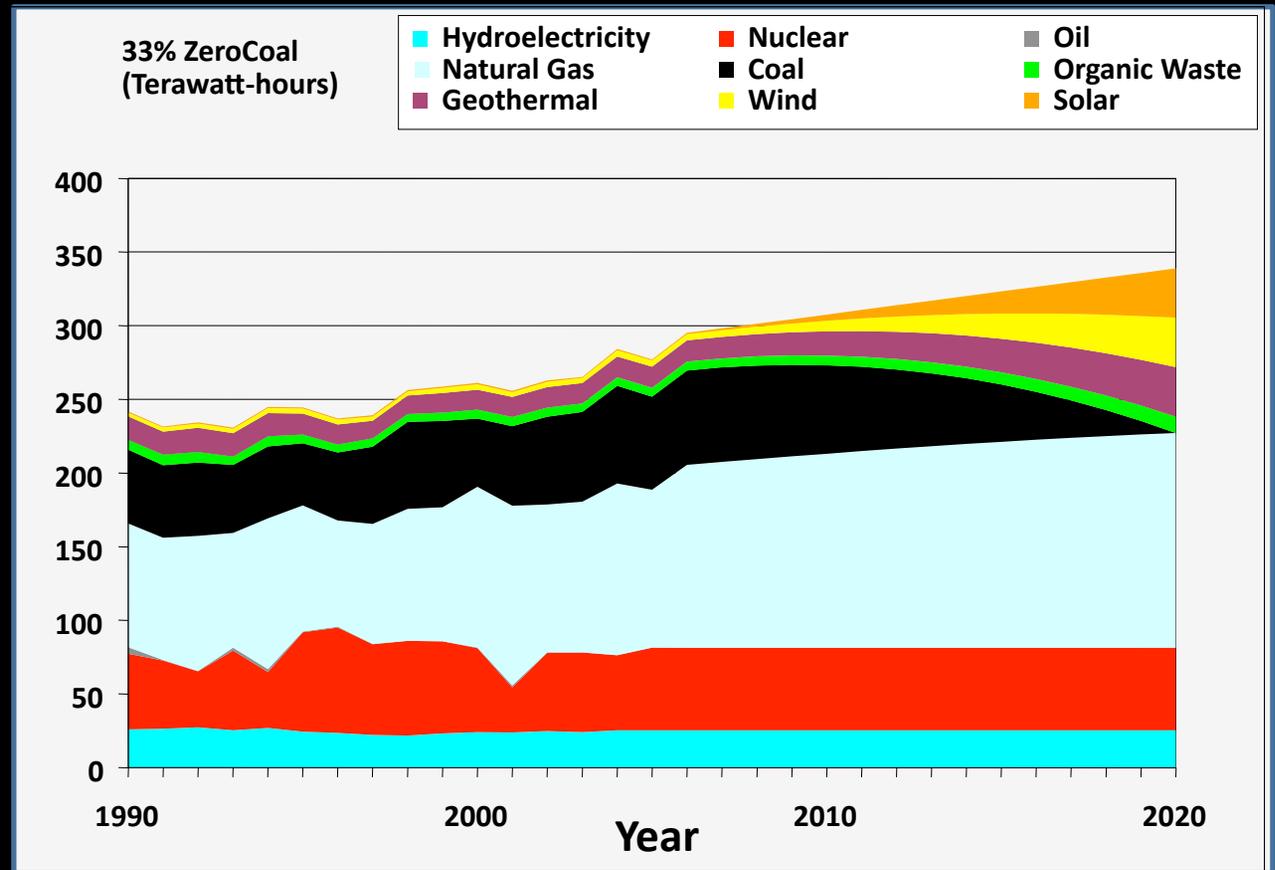
CENTER FOR ENERGY EFFICIENCY AND RENEWABLE TECHNOLOGIES, SACRAMENTO, CALIFORNIA

"Providing global warming solutions for California and the West"

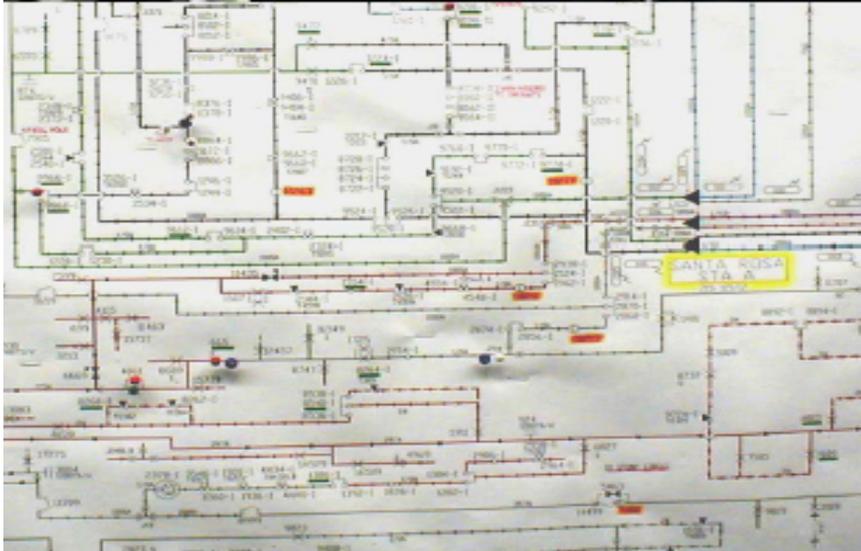
Renewable Energy Targets

Renewables:

- 20% by 2010
 - Current status:
 - Projected to meet by 2013
- 33% by 2020



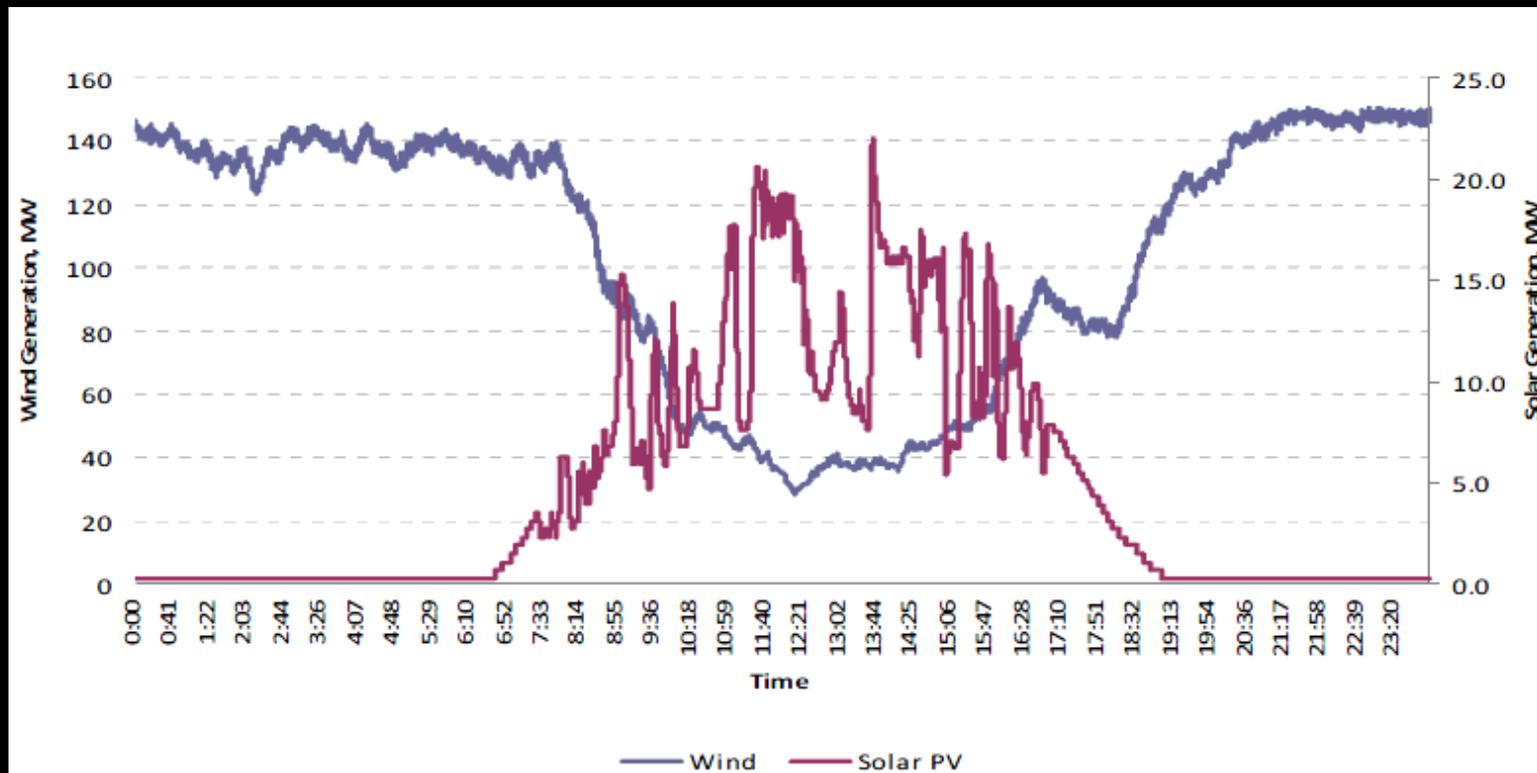
The Electric Grid



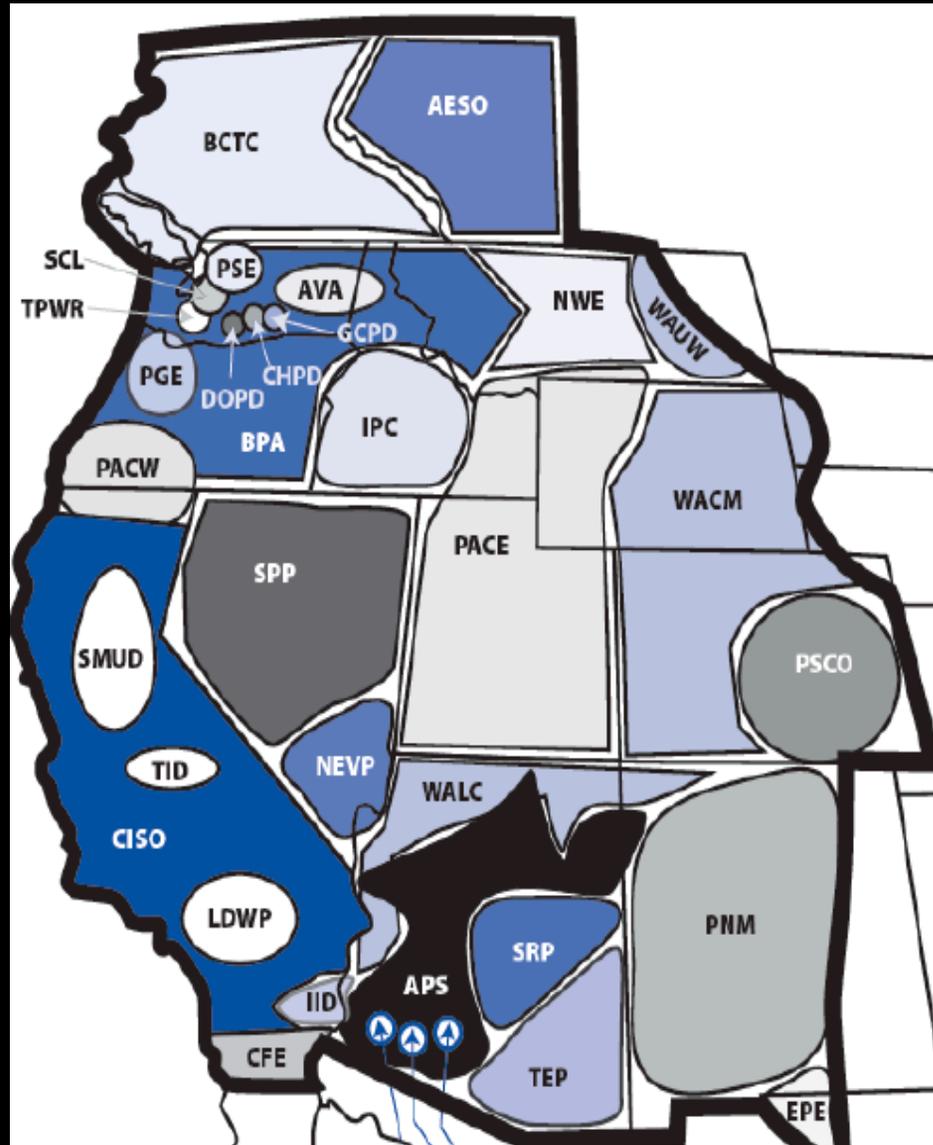
Variable Energy Resources

Sub Hourly Wind and Solar Generation

150 MW Wind and 24 MW Solar PV



Balancing Authorities in WECC (37 of them)

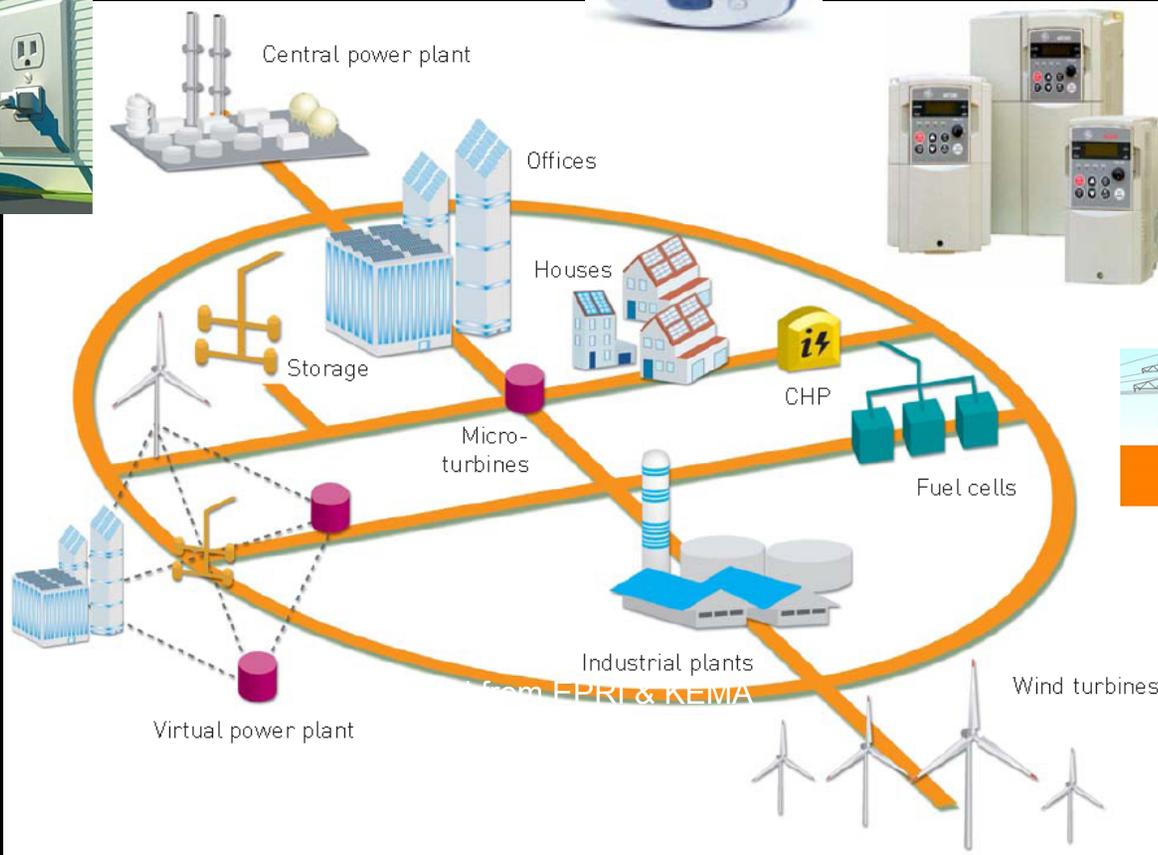


Making the Grid More Flexible

Seamless integration of new applications



Multi-directional



Real time Customer Interaction



Centralized & Distributed Intelligence



Centralized & Distributed Resources

Smart power electronics and materials



Renewable Energy Challenges

- Project Siting and Permitting
- Transmission Siting
- Cost Allocation
- Environmental

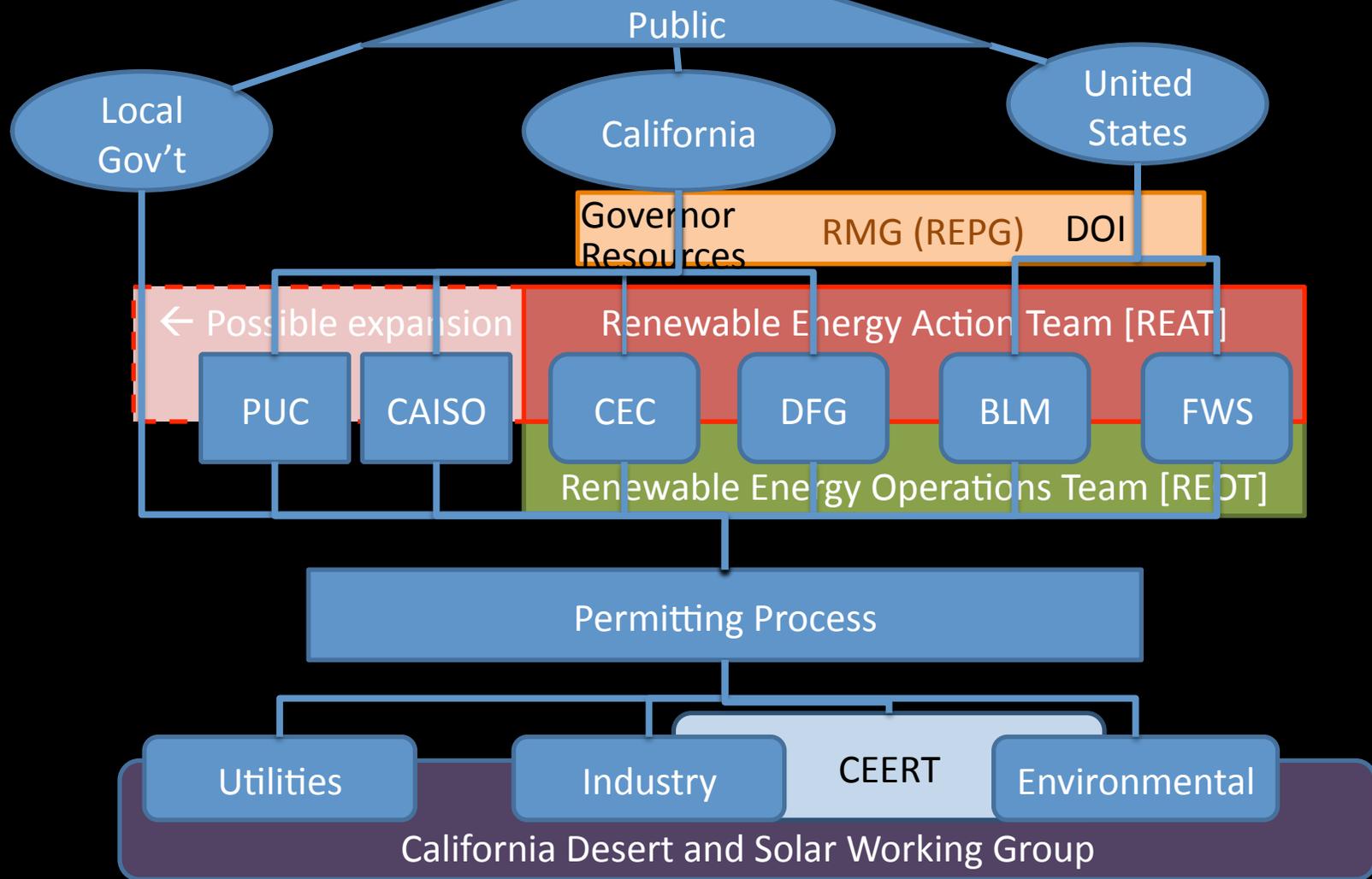


Land Use in California's Desert Region

Land Use	Acres
Desert Tortoise (Protected)	4.8 Million
Mojave Ground Squirrel (Protected)	1.7 Million
Defense Department	3.3 Million
Off Highway Vehicles	0.7 Million
Renewable Generation (needed for 2020 Goals)	0.05 Million
Mitigation for Renewables	?

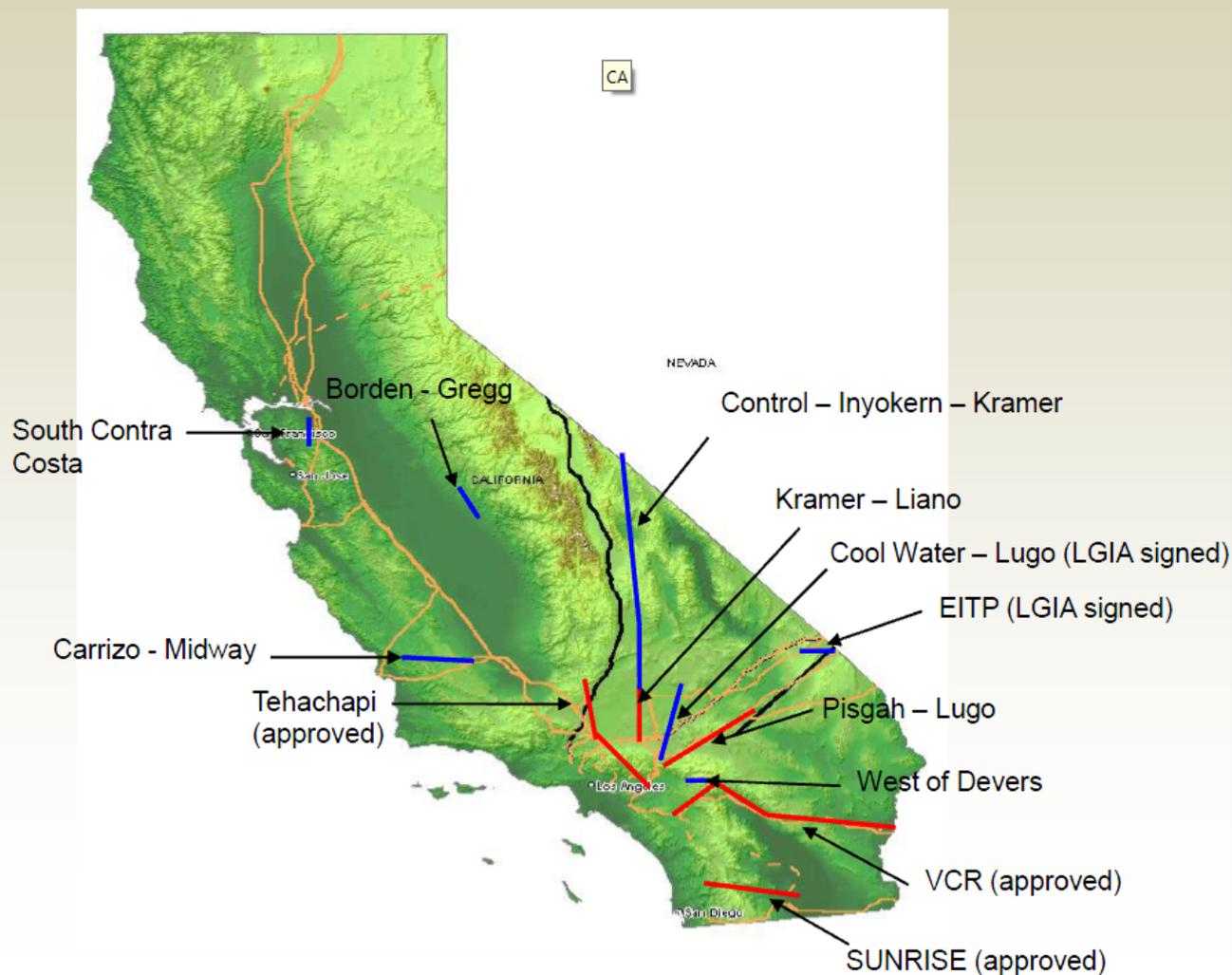
Note: Feinstein's Monument would take almost 1 million acres "off the table"

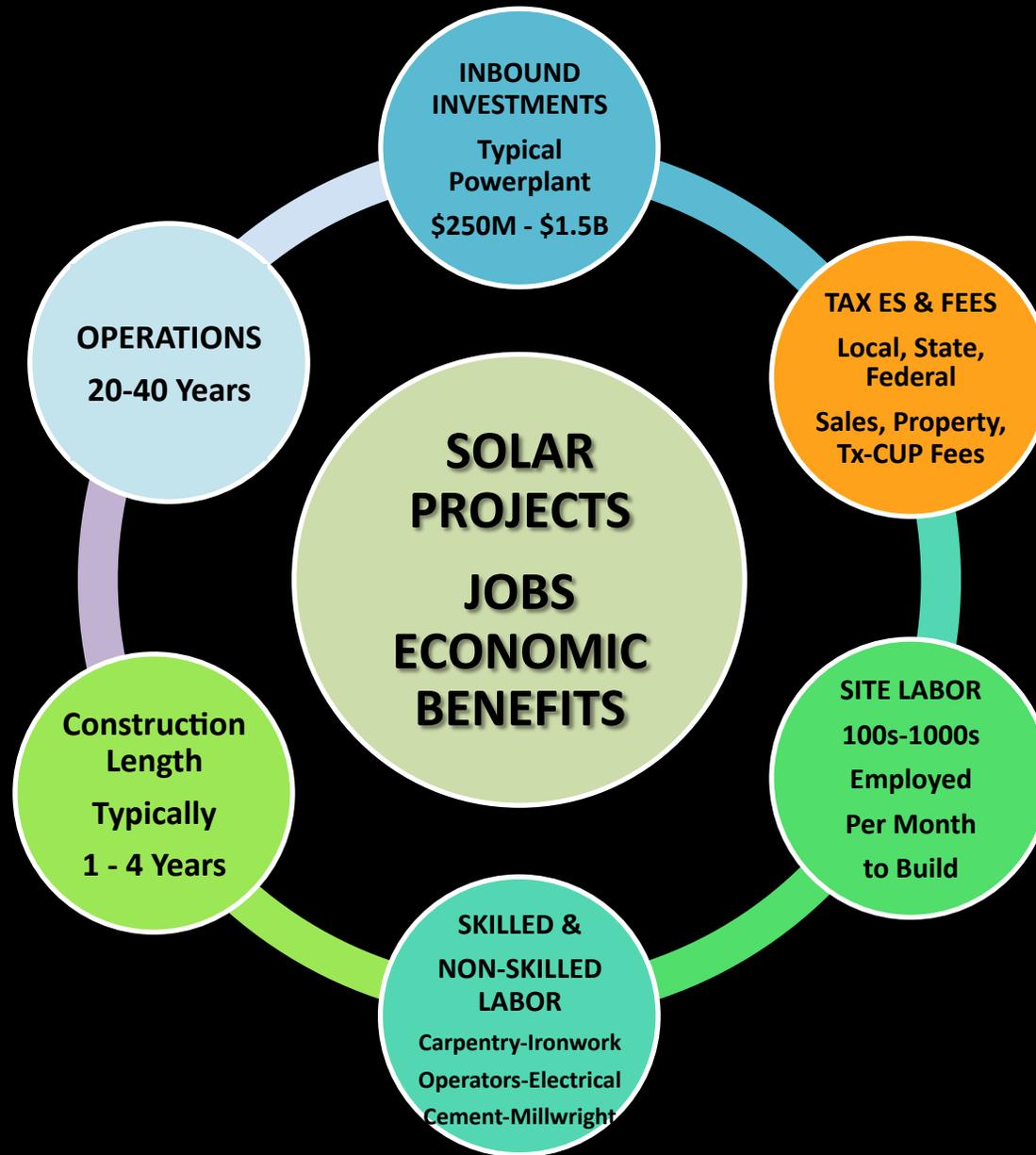
Permitting in California

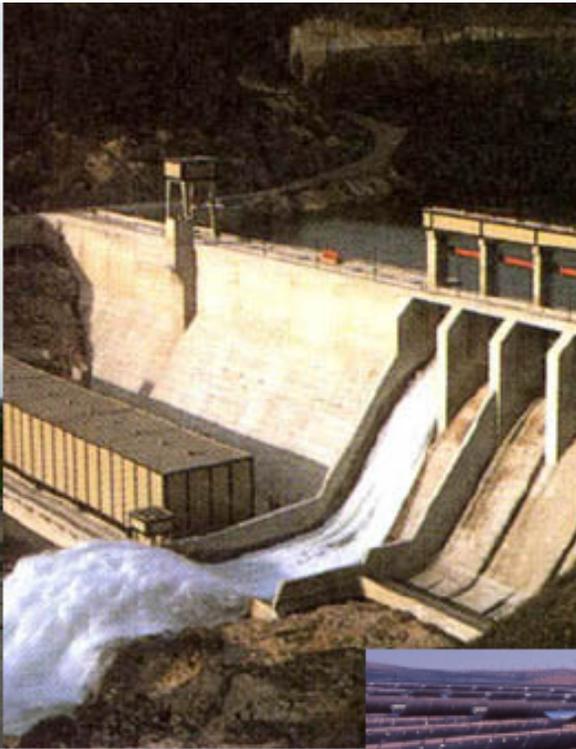




New Transmission Facilities allowing delivery of Renewable generation







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