

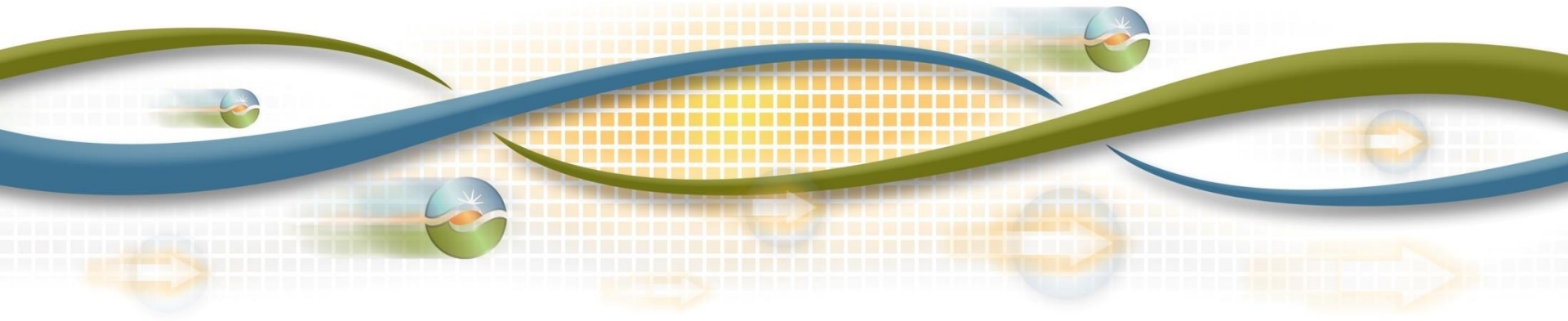


Electric Grid Resilience

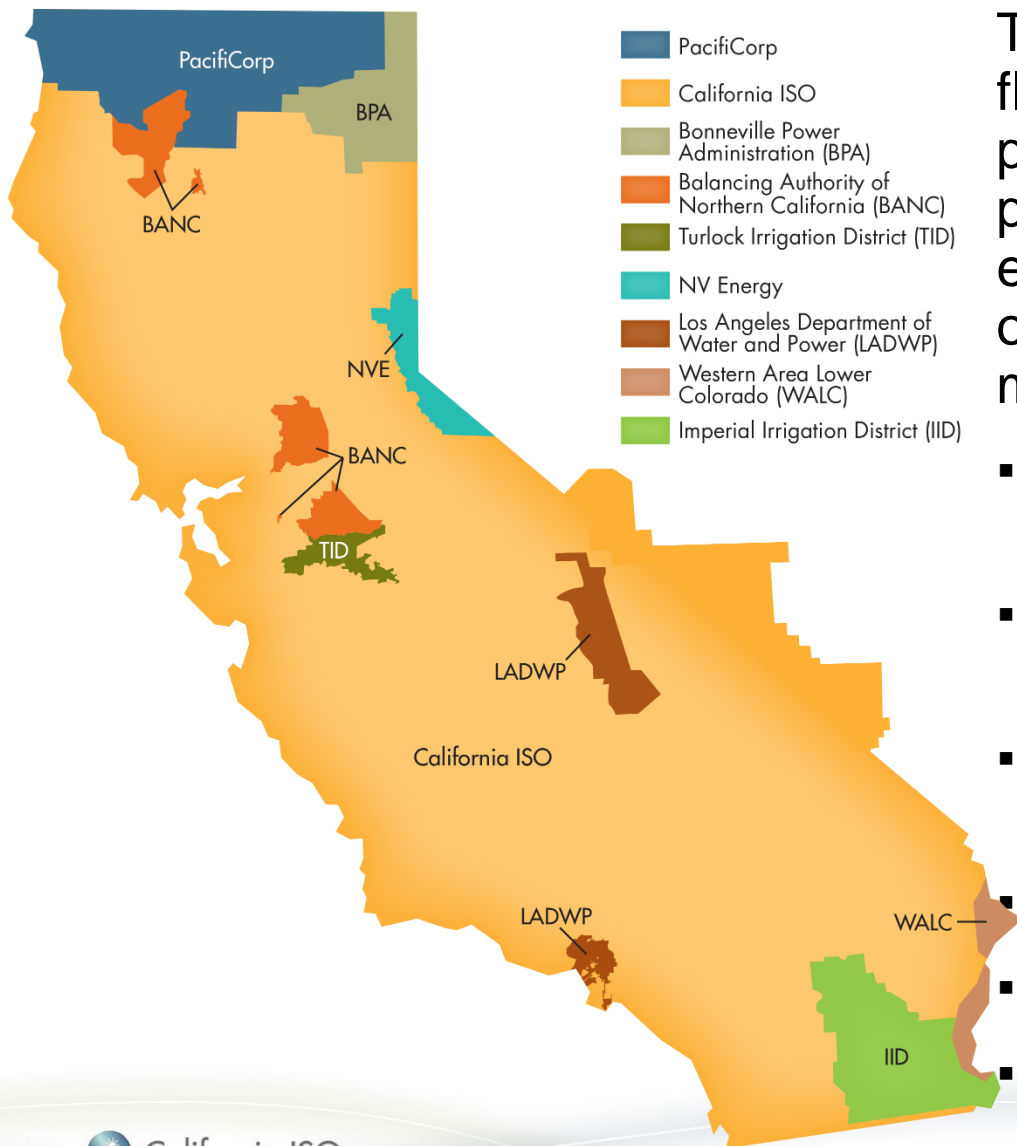
Keith Casey
Vice-President, Market and Infrastructure Development

Senate Oversight Hearing:
California's Next Mega-Quake: Assessing the State's Preparedness and
Response Strategy

July 19, 2017



California ISO by the numbers



The California ISO manages the flow of electricity for about 80 percent of California and a small portion of Nevada, which encompasses all of the investor-owned utility territories and some municipal utility service areas.

- **71,740** MW of power plant capacity (installed capacity)
- **50,270** MW record peak demand (July 24, 2006)
- **27,488** market transactions per day (2015)
- **25,685** circuit-miles of transmission lines
- **30 million** people served
- **240 million** megawatt-hours of electricity delivered annually (2015)

Roles and responsibilities of California ISO and the Investor Owned Utilities for Transmission Facilities

- California ISO
 - Identifies and approves the need for new transmission (reliability, policy, or economic reasons)
 - Assesses grid resilience from extreme events like earthquakes
 - Develops system restoration plans with utilities
 - Conducts emergency preparedness training with utilities and emergency organizations (e.g., Cal OES)
- Investor Owned Utilities
 - Responsible for design and construction standards including earthquake resilience for new and existing facilities
 - Manage service restoration plans including maintaining equipment spares

ISO assesses extreme events based on national reliability standards as a part of our annual transmission planning process

- ISO Planning Standards include extreme event requirements that are above the national standards
 - San Francisco Peninsula has unique characteristics requiring consideration of mitigation for the risk of extreme events based on:
 - high density urban load area,
 - geographic and system configuration,
 - potential risks of outages including seismic, third party action and collocating facilities; and
 - challenging restoration times.
 - Other areas may be considered on a case-by-case basis as a part of the ISO transmission planning process

In 2013 and 2014, the ISO and PG&E collaborated on an assessment of the San Francisco Peninsula

- Included detailed assessment of seismic risk scenarios
- Identified the need to reinforce or replace substation and transmission facilities to higher seismic design requirements
 - Upgrades underway with completion planned by 2022-2024
- Identified need to modify the Martin substation on San Francisco Peninsula
 - Approved by ISO Board of Governors
 - Estimated in-service date of 2022