

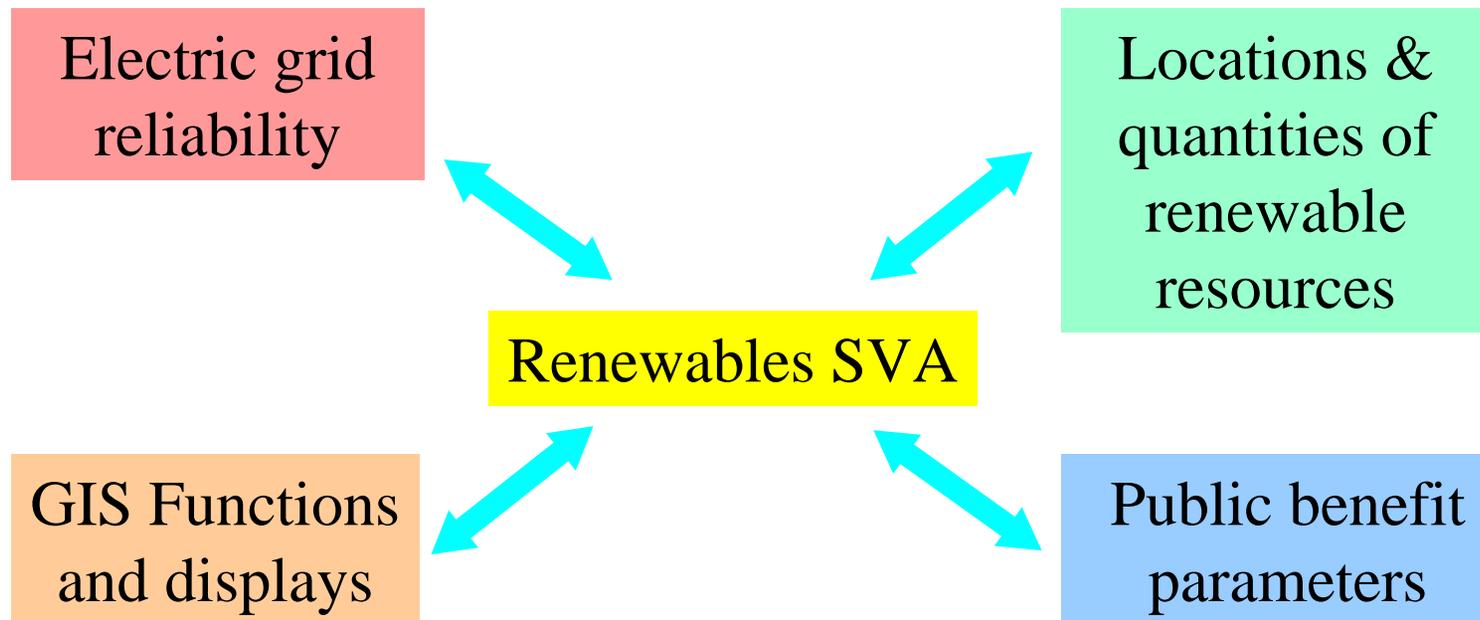
Status on Renewables Strategic Value Analysis and Research



*Integrated Energy Policy Report
Renewables Joint Committee Workshop
California Energy Commission
June 24, 2003*



Overall Goals of Strategic Value Analysis



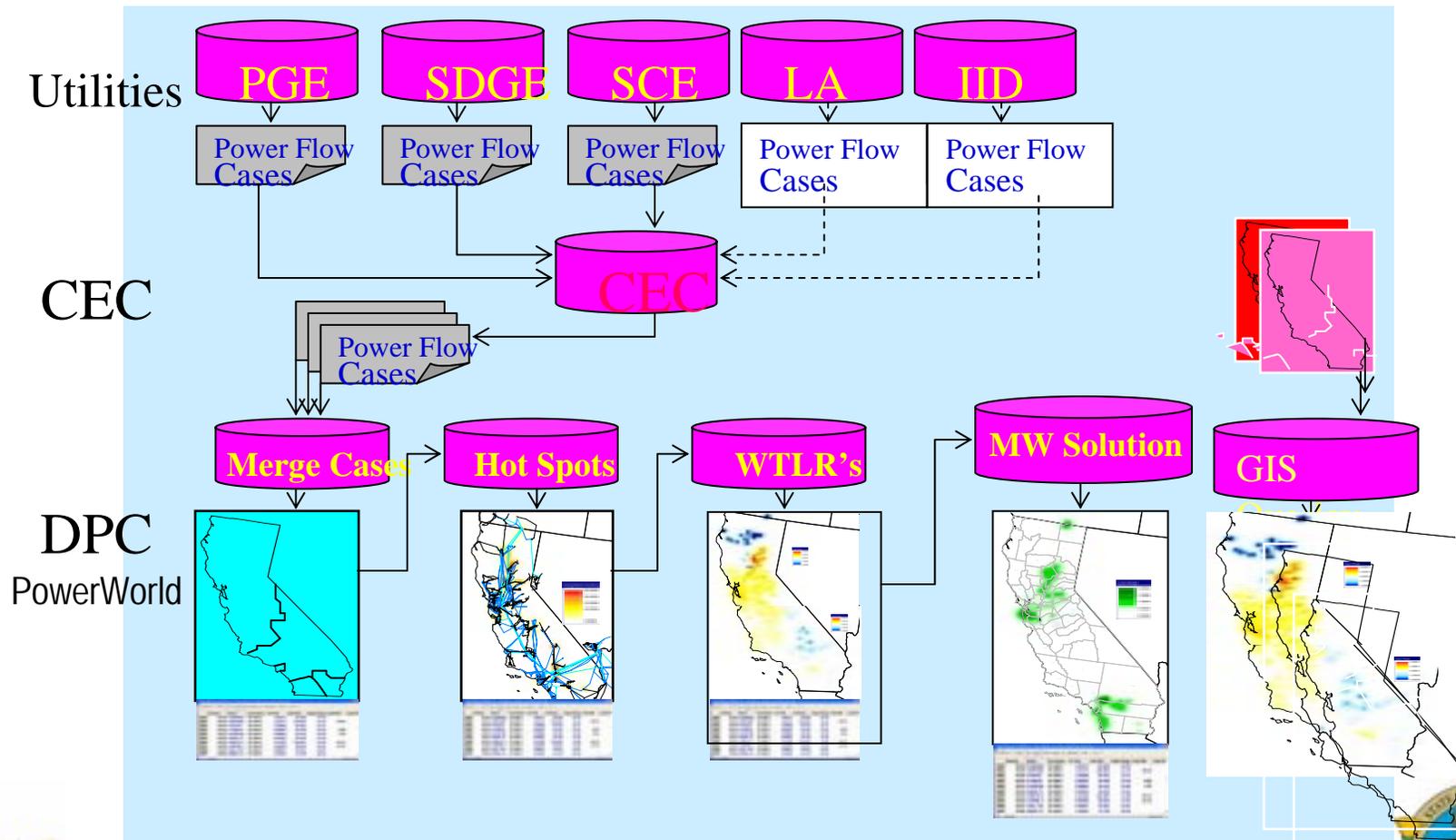
Strategically target development and deployment of renewables to provide the highest electricity and non-energy benefits to California

Steps in Renewables SVA



- ◆ *Conduct power flows to identify “hot spots”*
 - *Simulations from 2003 to 2017*
- ◆ *GIS data sets developed*
 - *Renewable resources*
 - *Demographics and environmental information*
- ◆ *Economic and technical performance data*
 - *Renewables; T&D upgrades; fossil*
- ◆ *Solve “hot spots” generically*
 - *Compare economics & performance of renewables against generic solution requirements*
- ◆ *Seek best overlays of electricity & public benefit solutions*

Flow of Products



Renewable Resource Assessments

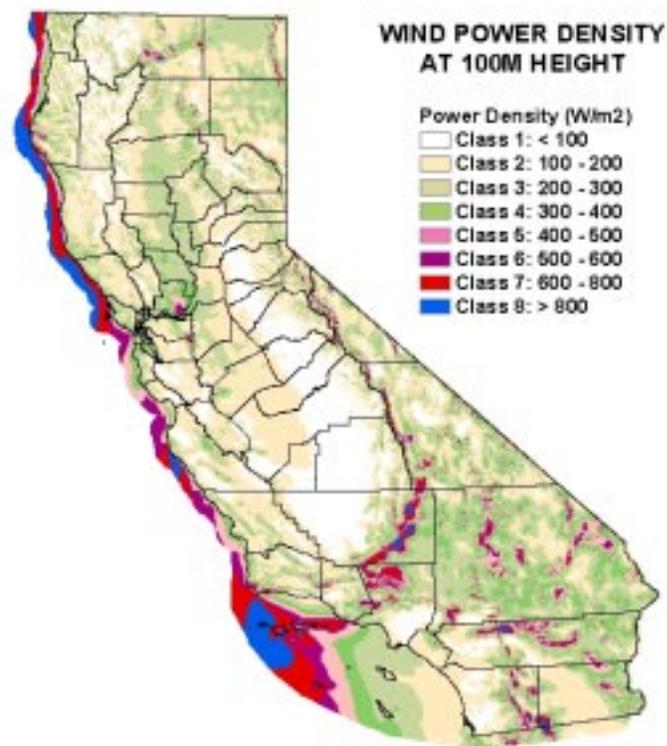
- ◆ *More accurate and up-to-date*

- ◆ *Wind Assessment*

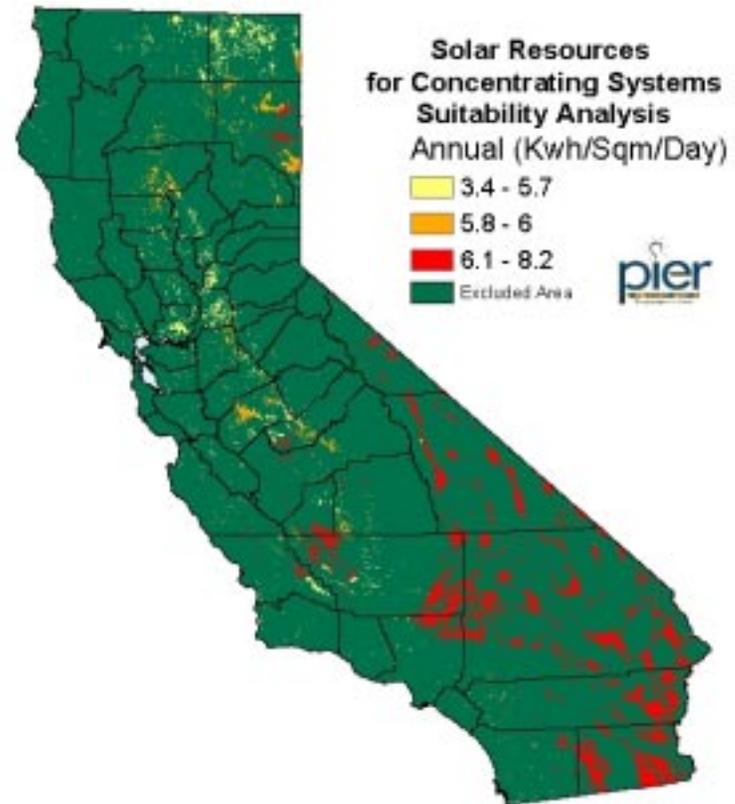
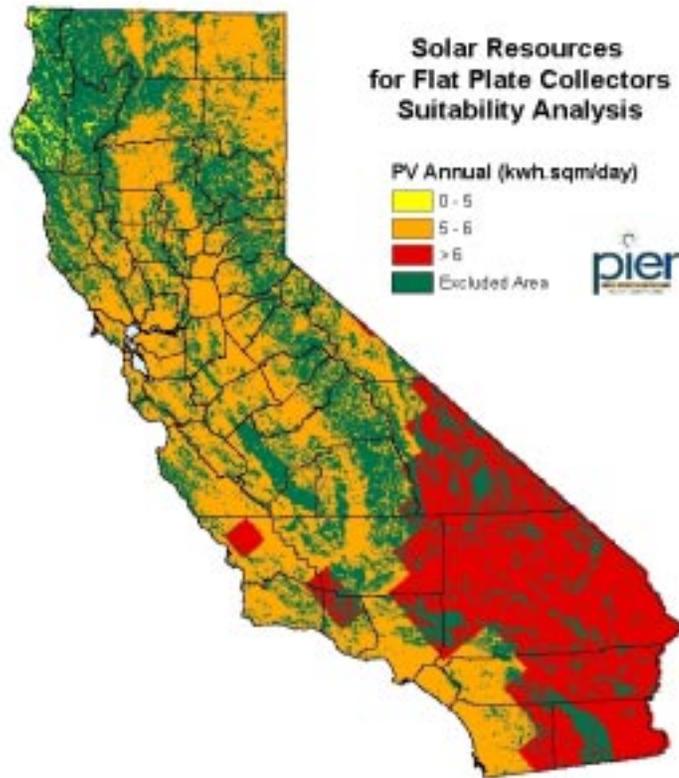
- *200 x 200 meter grid*
- *Wind speeds and power*

- ◆ *Pending or Underway:*

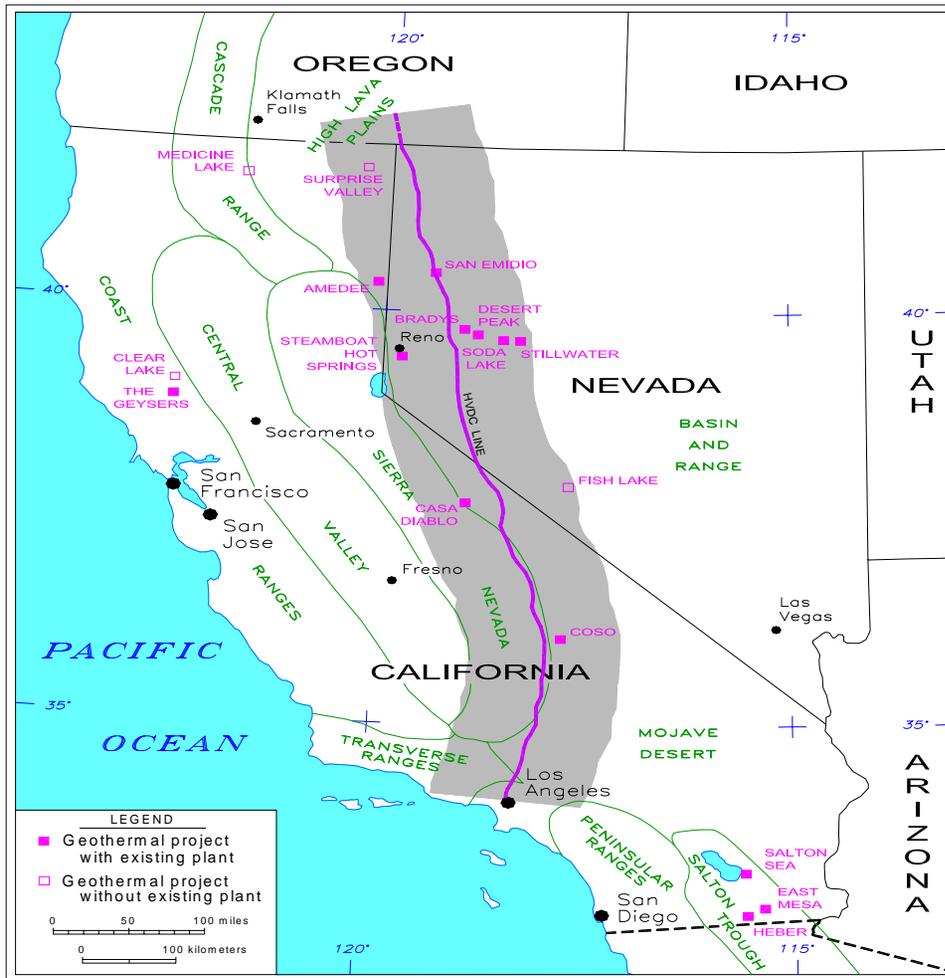
- *Solar*
- *Biomass*
- *Ocean*
- *Hydro*



Other Renewable Assessment Examples (Solar)



Other Renewable Assessment Examples (Geothermal)

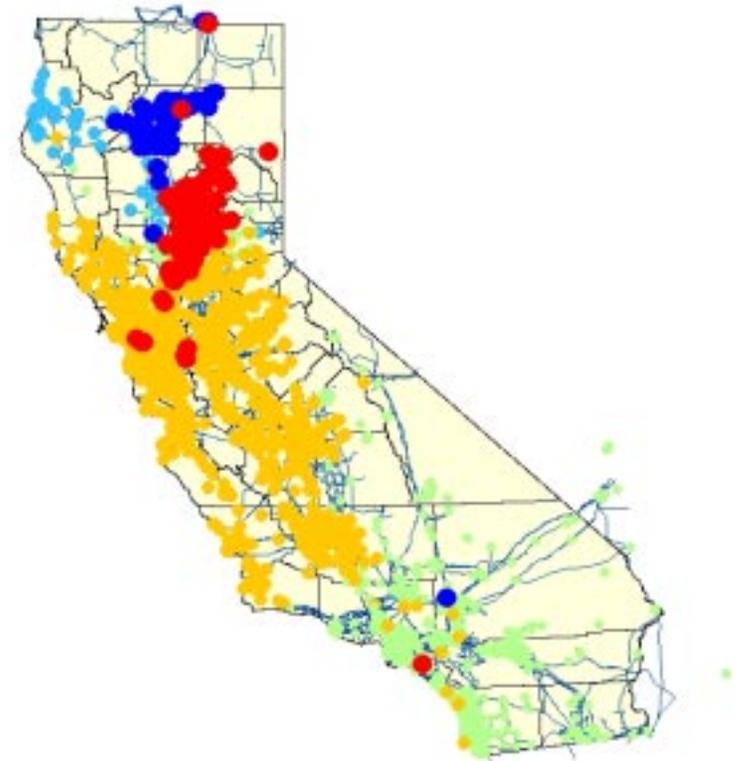


Geothermal
assessment
along Sierra
Pacific HVDC
line

Power Flow Simulations



- ◆ *Completed to date*
 - *2003, 2005, 2007*
- ◆ *Still to run*
 - *2009, 2011, 2013, 2015 & 2017*
- ◆ *Status*
 - *Being reviewed internally*
 - *Need to integrate out-of-state transmission studies*
 - *Localized “case studies” pending*



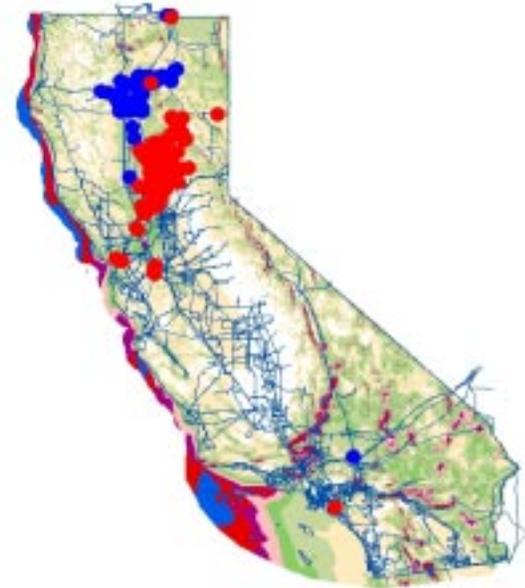
Integrating Renewable Assessments and Power Flows (Wind Example)



Wind power map

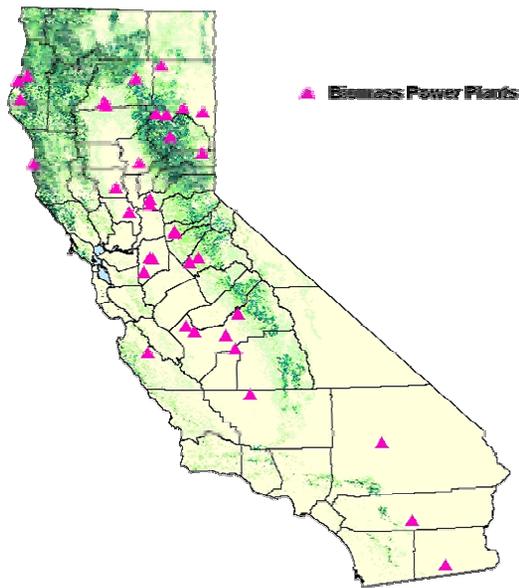


Wind power map with T&D system

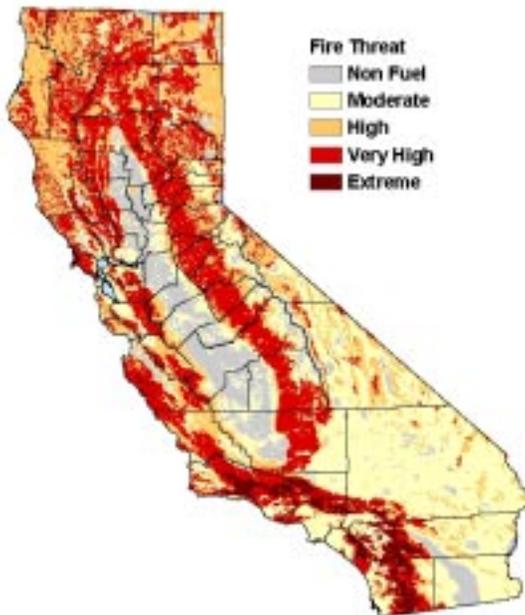


Wind power map with T&D system and “hot spots”

Integrating Renewable Assessments, Power Flows and Demographics

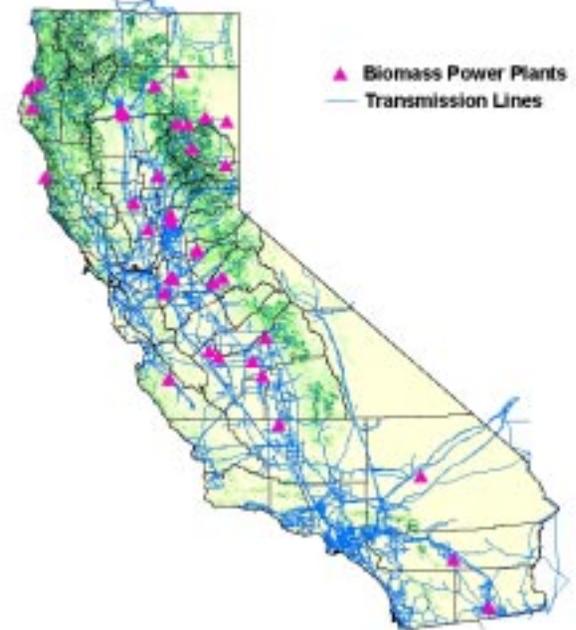


Forest Biomass &
Bio Power Plants



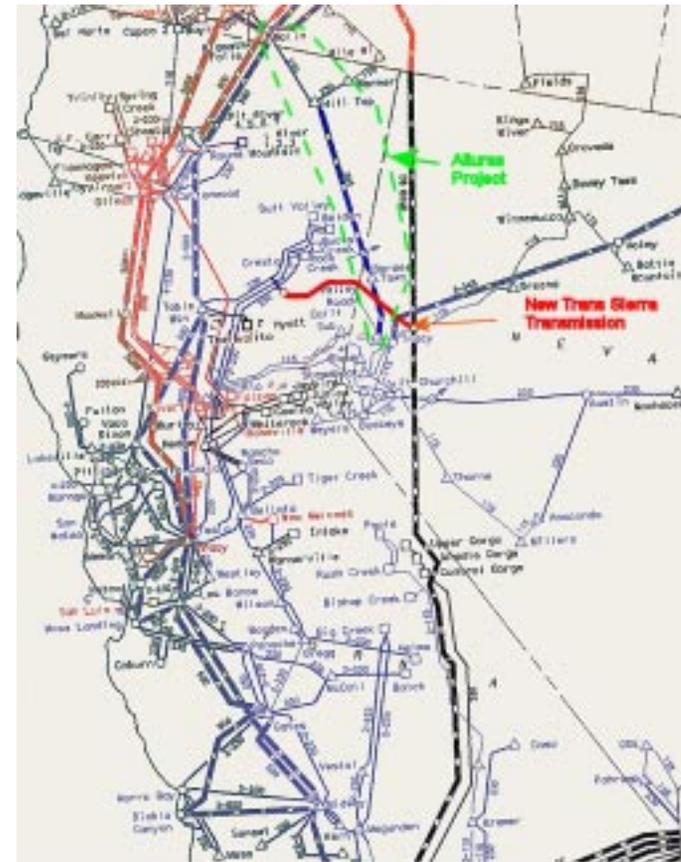
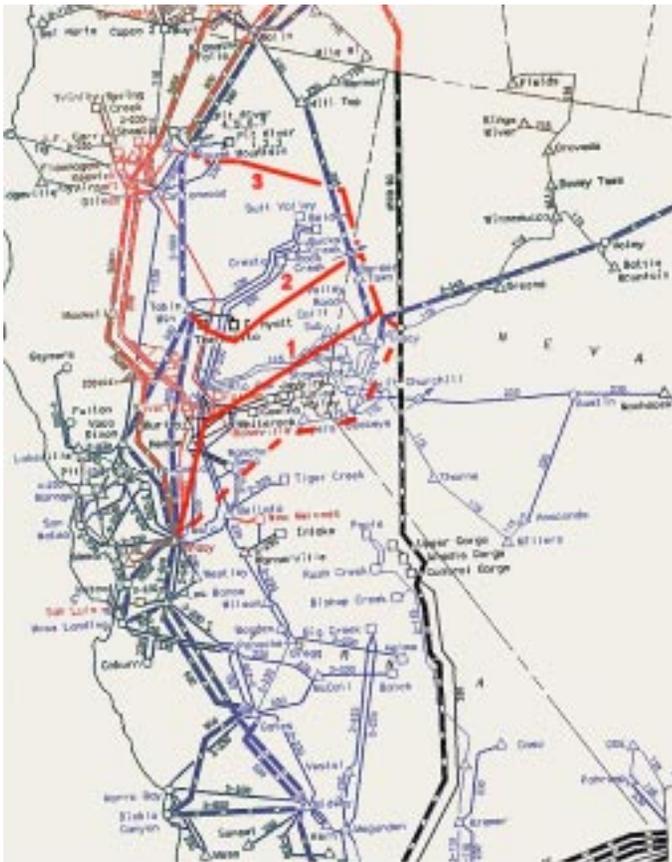
Fire Threat

Forest Wildfire
Threat Areas

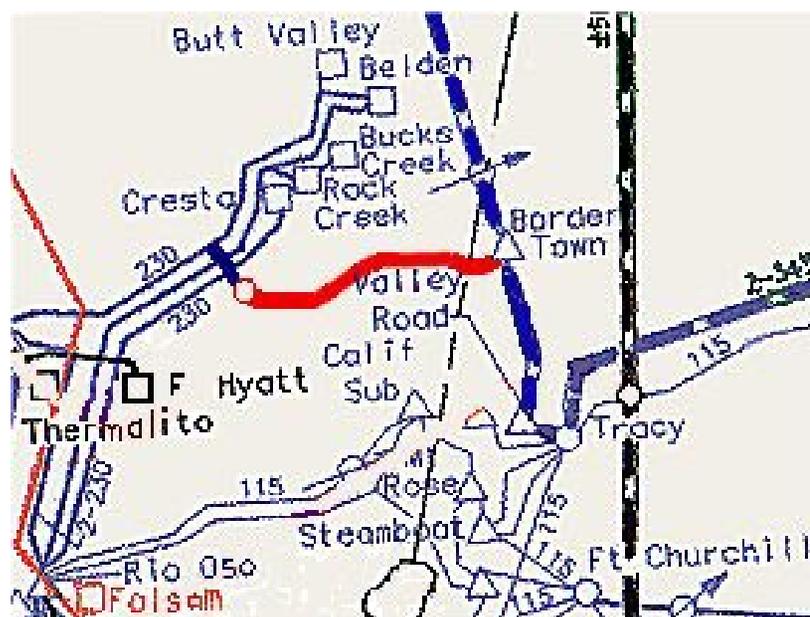


Forest Biomass,
Bio Power Plants
and T&D System

Evaluation of Transmission Corridors and Out-of-State Renewables

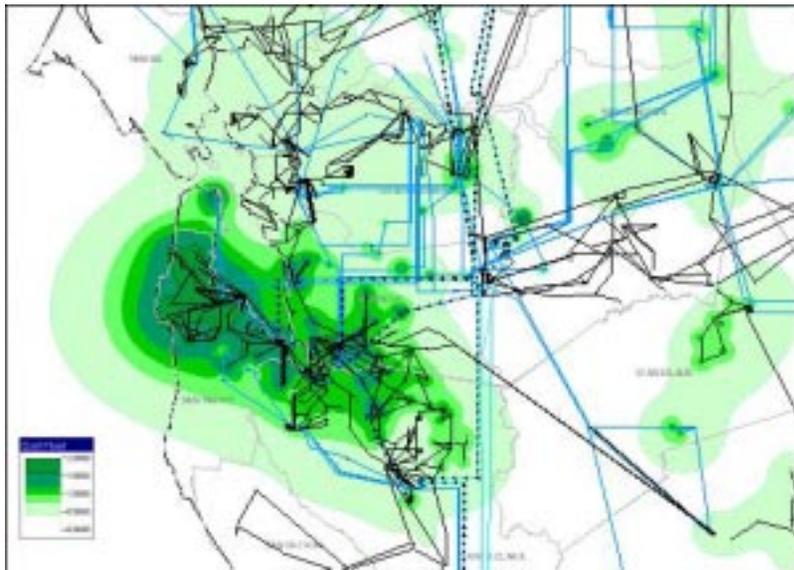


Investigating Transmission Options

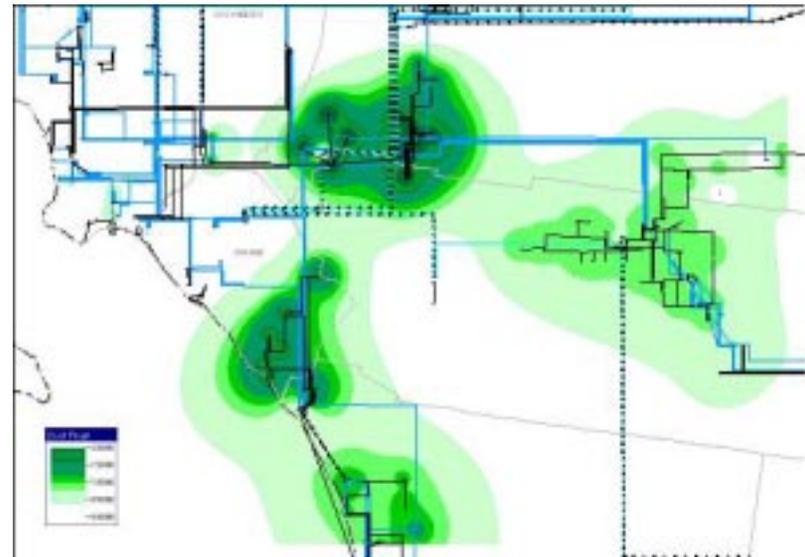


Terminating a new ac Trans-Sierra transmission line on the 3 – 230 kV PG&E lines.

Renewable DG Case Studies



Preliminary penetration studies in
Bay Area



Preliminary penetration studies in
Orange County

Report Contents (1 of 2)

◆ *Policy Issues and Scenario Summaries*

➤ *Electricity Situation: Current and out to 2017*

- ✓ *Transmission Constraints*
- ✓ *Capacity Constraints*
- ✓ *Peak Demand Issues*

➤ *Scenarios*

- ✓ *Straight line fit to RPS*
- ✓ *Electricity needs fit (SVA)*
- ✓ *Bulk renewables only fit*

➤ *Barriers*

- ✓ *Costs and performance*
- ✓ *Environmental and institutional*

Report Contents (2 of 2)

- ◆ *Renewable Resources (Costs, Quantities, Locations, etc)*
 - *Wind*
 - *Geothermal*
 - *Biomass (Solid Fuel & Biogas separately)*
 - *Solar (CSP and PV separately)*
 - *Water (Small hydroelectric and ocean separately)*
- ◆ *Renewable Research Efforts*