



# **California Energy Commission Collaborative State Transmission Assessment Workshop**

**(Docket 03-IEP-01: 2004 Integrated Energy Policy Report Update)**

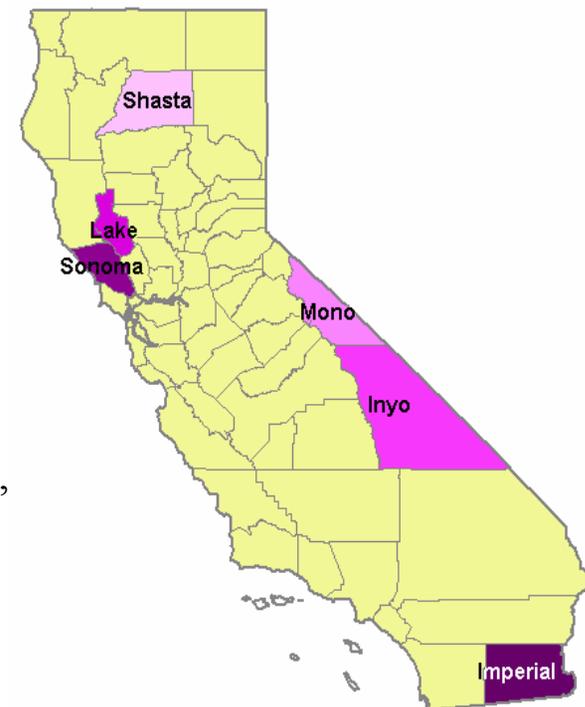
**Dale Stevens  
Manager Market Assessment  
MidAmerican Energy Holdings Company**

**May 10, 2004**



# Potential Geothermal Development by CalEnergy

|                         |                         |
|-------------------------|-------------------------|
| ➤ Existing              | 340 MW                  |
| ➤ Under Development     | 185 MW                  |
| ➤ Proven                | 600 MW                  |
| ➤ Additional Possible   | <u>1,100 – 1,200 MW</u> |
| ➤ Total Salton Sea KGRA | 2,225 – 2,300 MW        |



Proven – Evaluations of the geothermal field by GeothermEx,  
a reservoir engineering consulting firm.

Possible – Potential reserves estimated by The Energy and  
Geoscience Institute (“EGI”) at the University of Utah, as  
recently published in articles.

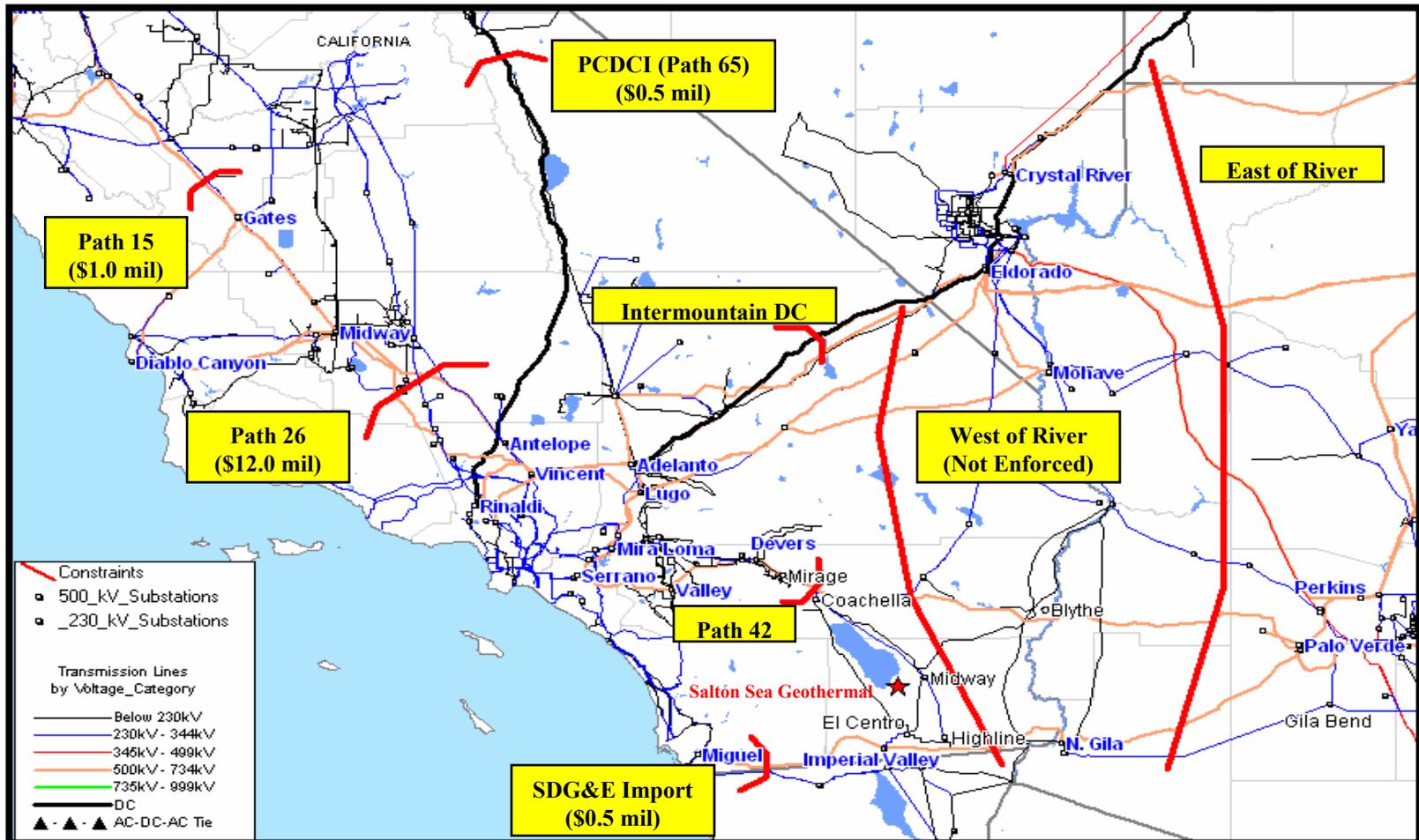
Additional existing resources: About 180 MW (See [www.geo-energy.org](http://www.geo-energy.org))

# Physical Limits of Transmission Facilities



- Regional
  - East of River 7,550 MW (8,300 MW after short-term upgrades)
  - West of River 10,118 MW
  - IID – SCE (Path 42) 600 MW
  - Path 26 3,400 MW
  - Path 15 3,950 MW
  - North of Miguel 2,000 MW
  - SDG&E Import Limit 2,850 MW
- IID Points of Delivery
  - Mirage – Devers (Cal ISO) 600 MW
  - Imperial Valley (Cal ISO) 1,120 MVA
  - Blythe (WAPA) 165 MVA
- IID Internal System
  - Current infrastructure insufficient to support another 200 MW unit

# Southern California Regional Congestion

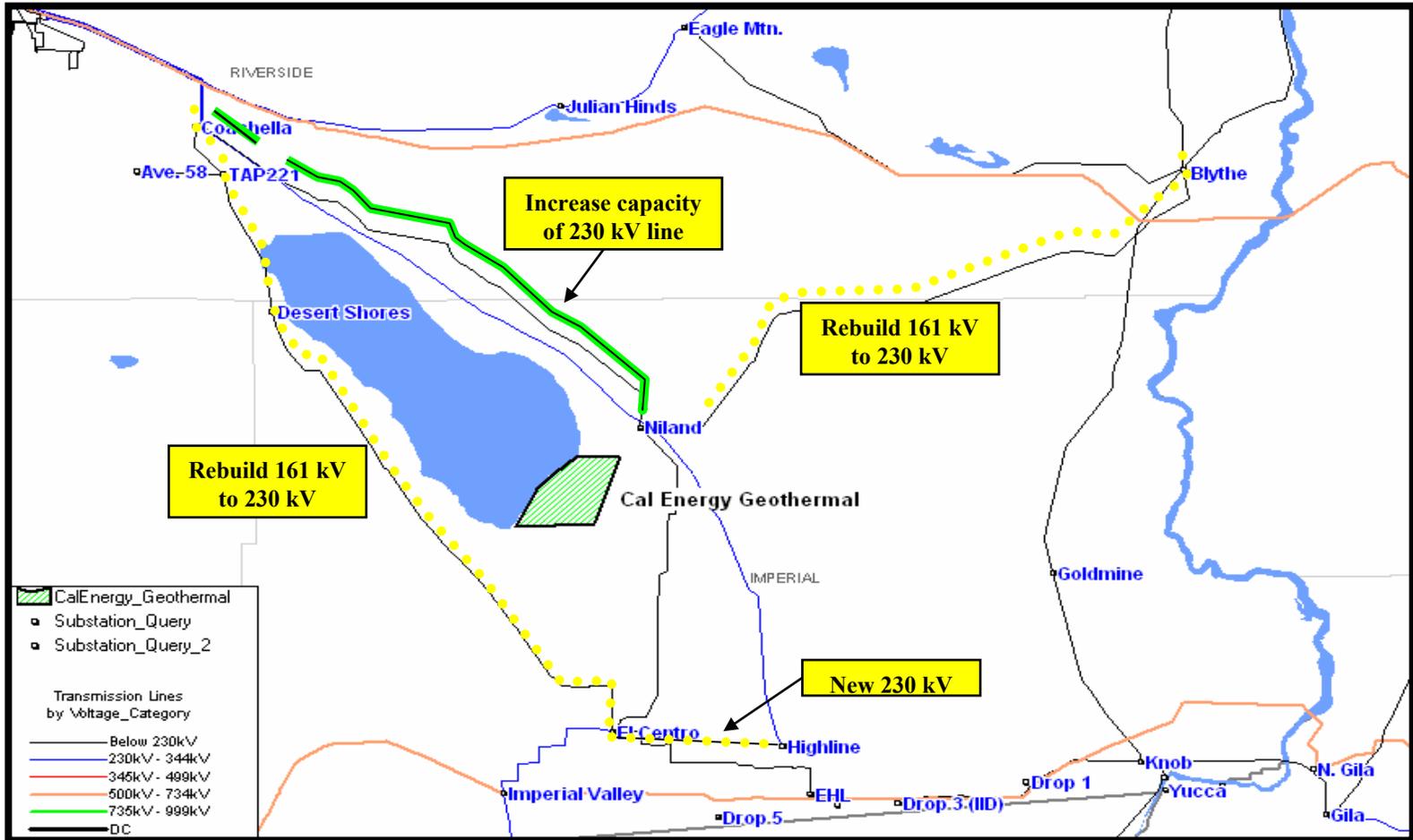


# Geothermal Development



- New geothermal development schedule
  - Construct 3 new 200 MW plants, one every 2 years starting in 2009  
*(all 600 MW could be developed by 2010 under expedited conditions)*
  - Develop remaining 1,100 to 1,200 MW of geothermal power beyond 2013
  
- Preferred Interconnection:
  - Connection to Cal ISO at Mirage-Devers and/or Imperial Valley, and WAPA at Blythe
  - New 230 kV transmission infrastructure needed within IID to support interconnection
  - Alternatives:
    - New Cal ISO transmission from Imperial Valley 500 kV substation to San Diego via Salton Sea
    - Interconnect resource to new line near southern Salton Sea area

# Possible Upgrades to IID System for New Geothermal Interconnection



# Transmission Impact of New Geothermal Facilities



- Transmission to support 600 MW of new development
- Possible staged development of transmission, pending studies
- Regional operational impact unknown, but probably minimal
- Upgrade existing transmission corridors to minimize impact; some new transmission corridors likely
- No interconnection studies currently requested
- Regional RPS studies by IOUs in progress
- Permits and approvals required: Environmental, archeological, land use, CEC, BLM
- Actions to facilitate transmission development
  - Involve all stakeholders in planning
  - Provide flexibility for changes in load, generation and transmission



# Conclusion

- Significant geothermal resource available in Southern CA from Salton Sea KGRA
- RPS in place in CA
- Acceleration of RPS requirements
- CE applauds and encourages continued coordinated transmission planning with all affected parties