Southern California Edison
Presentation to the Harvard Electricity Policy Group June 1, 2006

Panel: “Carbon Dioxide Emissions Controls and Electricity Markets”

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Climate Change Policy - Overview

- Challenge is to reduce GHG dramatically by end of century on global level (60-80% below business as usual case)

- Reductions by developing countries critical
  - Developing countries’ GHG emissions will overtake those of developed countries by the end of the decade or soon thereafter

- California wants to act fast—“...the debate is over. We know the science. We see the threat. And we know the time for action is now.”—Governor Arnold Schwarzenegger, June 1, 2005
  - Current proposals likely to be costly
  - IOU electric utilities likely to have few compliance options
  - Compliance mechanisms and “safety valves” needed

- Low carbon technology revolution needed this century—RDD&D
SCE Position

- Climate change is a century scale problem that must be addressed on a global level through comprehensive and cost effective means.

- Without a commercial CO\textsubscript{2} removal and storage technology, cap programs (e.g. California’s proposals) will increase the cost of electricity and reduce fuel diversity.
Challenge: Reduce Current Global Emissions By End of Century

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Source: EPRI: A Climate Contingency Roadmap, November 2003 based on Intergovernmental Panel on Climate Change, Second Technical Assessment Report IS92a
Global CO₂ Emissions: Industrial vs. Developing Countries (1990-2025)


Source: Energy Information Administration, International Energy Outlook 200—Table A-10
California’s Climate Policy Context

- Governor Schwarzenegger’s June 1, 2005 Executive order
- Major legislative proposals
  - Speaker Nunez / Assemblywoman Pavley Assembly Bill 32
  - Senator Pro Tem Perata Senate Bill 1368
- California Public Utilities Commission (IOUs and Jurisdictional LSE’s) climate policy program
California GHG Policy

- Governor’s Executive Order
  - Reduce to 2000 levels by 2010
  - Reduce to 1990 levels by 2020
  - Reduce 80% below 1990 levels by 2050

- Governor’s Climate Action Team (CAT) Report
  - Implement existing and new regulatory programs to meet 2020 goal
    - Consider trading, credit auction, and offsets
    - Consider working with other western states to minimize emissions leakage.
  - Require mandatory reporting from oil and gas extraction, oil refining, electric power, cement manufacturing, and solid waste landfills
  - By July 2007, update the macroeconomic analysis and perform a cost-effectiveness analysis
  - CPUC policies (CCGT performance standard; demand cap) “generally consistent” with the Integrated Energy Policy Report; should be extended to municipal utilities and all load serving entities
California GHG Policy

- AB 32 (Speaker Nunez/Assemblywoman Pavley) requires the California Air Resources Board (CARB) by 2008 to:
  - Establish a mandatory GHG reporting system for “all significant sources” includes out of state electric supplies
  - Adopt regulations that will reduce CO₂e emissions to 1990 levels by 2020 beginning in 2012 and “gradually” reducing emissions to meet the target
  - Provide “compliance flexibility where appropriate”

- SB 1368 (Senate President Pro Tem Perata)
  - Requires that all baseload (60% CF) procurement of three years or more meet the average GHG emission rate of natural gas fired, existing combined cycle baseload generation
Comparison of Electricity by Fuel Type

Sources
1. Power Content Label
3. EIA/Annual Electric Generator Report 2004
5. SCE’s Power Content Label - Projected, March 2006

Legend
- Coal
- Renewables
- Hydro
- NG
- Nuclear
- Other
Comparison of Electric Generation Carbon Intensities in U.S.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Metric Tons CO₂/MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. ¹</td>
<td>0.62</td>
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<tr>
<td>Mountain States ²</td>
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<tr>
<td>LADWP ³</td>
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<td>California ⁴</td>
<td>0.37</td>
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<tr>
<td>SCE ⁵</td>
<td>0.32</td>
</tr>
</tbody>
</table>

**Sources**

1. EIA Annual Energy Outlook 2005 for 2003
3. California Climate Action Registry (CCAR) for 2002
4. CCAR from WECC California Emissions factor from EPA eGrid data bas for 2000
5. CCAR for 2004
SCE Compliance Options Under Cap Are Limited

- 16% renewables in current energy mix—many challenges in getting greater penetration

- All cost effective energy efficiency underway—
  - electricity use by California's citizens has been basically stable, per person, over the past thirty years; even though for the rest of the country, electricity use per person is up by around 50 percent. –Ralph Cavanaugh NRDC, April 15

- Fuel switching (coal to gas) options limited and expensive
  - (SCE coal fired electricity 18% in 2004 prior to Mohave Generating Station shutdown; now estimated to be about 7% for 2006)

- Required to meet customers’ electricity needs (growing at 1.5% to 2%)

- Near-term CA GHG emission reduction strategies likely to be high cost – “safety valve” such as reasonable offsets, a minimum necessity
Electricity’s Role in the Energy System Expands (kWh/total final energy)
Changing the Paradigm
California First … In Innovation

Unilateral mandatory GHG reduction programs are likely to be ineffective and expensive. If California moves ahead to implement such programs it should:

- Take a comprehensive, all GHGs, all emitters, long-term approach rather than focusing primarily on short-term GHG reductions
- Focus on investments in transferable technologies/efficiency to lower carbon footprint and make impact on global nature of climate change
- Reduce carbon intensity of coal for electricity (California needs to use coal; US is the “Saudi Arabia of coal”—25% of world’s known reserves)