Electricity Supply Adequacy in the West

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Chairman, California Energy Commission

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2000 Energy Outlook Conference
Is There a Problem?

• The Summer of 1998
  – Record High Temperatures throughout the West
  – Record High Electricity Demand
  – Four Stage Two Emergency Alerts in California

• The Summer of 1999
  – Cool Summer… But
  – Record High Electricity Demand
Twenty five percent of the state’s electricity comes from out-of-state generation

- In State: 75%
- Pacific Northwest: 11%
- The Southwest: 14%
A Country in Transition
Percentage changes in population from April 1, 1990 through July 1, 1999

- Fastest-growing states
- Slowest-growing/shrinking states

- WASH. +18.3%
- ORE. +16.7%
- IDAHO +24.3%
- NEV. +50.6%
- UTAH +23.6%
- COLO. +23.1%
- ARIZ. +30.4%
- TEXAS +18.0%
- FLORIDA +16.8%
- IOWA +3.3%
- N.Y. +1.1%
- MAINE +2.0%
- MASS. +2.6%
- R.I. -1.3%
- CONN. -0.2%
- GEORGIA +20.2%
- N.D. -0.8%
- W. VA. +0.7%
- PA +0.9%
- N.D. -0.8%
- IOWA +3.3%
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Non-Coincident Peak Demand Reserve Margins
1993-1998

Percent

WSCC  California  Southwest

0%  2%  4%  6%  8%  10%  12%  14%  16%  18%  20%
Similar Conclusions

• Bonneville Power Administration
  – The White Book, 1999

• National Electricity Reliability Council
  – Summer of 1999 Assessment Report

• ICF Kaiser
  – Early 1999

• Northwest Power Planning Council
  – December 1999

• US Department of Energy
  – January 2000
## Peak Capacity Needs

MWs of Capacity

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<thead>
<tr>
<th>Year</th>
<th>Average</th>
<th>1-in-5</th>
<th>1-in-10</th>
<th>1-in-40</th>
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<tbody>
<tr>
<td>1999</td>
<td>(725)</td>
<td>1,182</td>
<td>2,527</td>
<td>3,940</td>
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<td>2000</td>
<td>397</td>
<td>2,341</td>
<td>3,714</td>
<td>5,155</td>
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<tr>
<td>2001</td>
<td>1,541</td>
<td>3,524</td>
<td>4,924</td>
<td>6,394</td>
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<td>2002</td>
<td>2,707</td>
<td>4,731</td>
<td>6,159</td>
<td>7,658</td>
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<tr>
<td>2003</td>
<td>3,897</td>
<td>5,961</td>
<td>7,418</td>
<td>8,947</td>
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<tr>
<td>2004</td>
<td>5,111</td>
<td>7,216</td>
<td>8,702</td>
<td>10,262</td>
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<td>2005</td>
<td>6,349</td>
<td>8,496</td>
<td>10,012</td>
<td>11,603</td>
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### CAL ISO Peak Demand Load Resource Balance at 7% Operating Reserve

<table>
<thead>
<tr>
<th>Year</th>
<th>Megawatts</th>
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<tbody>
<tr>
<td>2000</td>
<td>40,000</td>
</tr>
<tr>
<td>2001</td>
<td>45,000</td>
</tr>
<tr>
<td>2002</td>
<td>50,000</td>
</tr>
<tr>
<td>2003</td>
<td>55,000</td>
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#### Resources
- **Interruptible**
- **Imports**
- **Firm Trans.**
- **Powerplants**
- **Existing**

**Existing Resources**
- Installed resources, less outages of 43,856 - 2,572 = 41,104

**Imports** additional amounts are available in nominal and 1:5 scenarios, but not necessarily in 1:40 scenario.
Daily Peak Loads
California ISO Control Area

*June 1998 - October 1999*

- **August 3, 1998**
  - 44,927 MW

- **July 12, 1999**
  - 45,884 MW

- **Summer of 1998**

- **Summer of 1999**
Non-Continuous Duration of Price Levels,
Day-Ahead Unconstrained PX, 1999

Note: Price in the real time balancing market was capped at $250/MWh until this limit was raised to $750/MWh on 10/1/99. Although the unconstrained PX price never exceeded $225/MWh, the NP15 price (effective in Northern California) reached $725 for four hours on 10/1/99.
Is New Entry Cost Effective?

- New combined cycle need to receive $80 - $100/kw to cover total costs.

- New generators would have lost money in 1998.

- In 1999, a new efficient combined cycle (6800 BTU/KWh) might have covered its cost in Northern California’s energy market. It would have lost money in Southern California.

- Ancillary services are currently adding 11% to total generator revenues.

- Reliability must-run contracts are adding 8-10% to total generator revenues.
Accumulated Earnings of a CCGT, 1999
Burning Gas at 6800 Btu/kWh

$\$/kW

April May June July Aug Sep Oct Nov Dec

NP15
UMCP
SP15
California’s Response to Supply Adequacy

- No state agency has sole responsibility and authority to ensure adequacy.
- Using market simulations, identify supply/demand shortfalls.
- Inform agencies and market participants.
- Public debate over options and priorities
- Coordinate responses to modify market rules to enhance market responses.
- Monitor situation and identify contingency plans.
What Actions Are Needed?

• Enable electricity users to respond
  – To prices if they choose to do so
  – To sell their load for compensation
• Encourage voluntary load reduction
• Educate about the value of energy efficiency
• Search for existing, but underused supplies
• Work towards a regional solution
What’s Happening

• Cal ISO/Cal PX
  – ISO Load Participation by Summer 2000
  – PX Market Improvements

• Utilities
  – Load Curtailment Proposals by Summer 2000

• Public Utilities Commission
  – Rate Design

• Energy Commission
  – Siting Cases, Regulations, Assessments