Energy Action Plan

A Preliminary look at Peak Loads and Resources for 2007 and Policy Issues to Consider

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Electricity Analysis Office

Joint Meeting
December 11, 2006
Topics of this presentation

- Review of 2006 weather adjusted demand.
- Preliminary look at Probability of meeting reserve margins in 2007.
- Policy issues regarding the use of Demand Response and Interruptibles.
- Review of CA ISO Emergencies called over the last 5 years and possible options for reducing frequency.
2006 Weather Adjusted Actual Loads

2006 ISO summer daily peak tracking

Estimate based on 2005 weather-load relationship, 2006 observed weather and 2005 IEPR growth rate
## 2007 Summer Monthly Outlook
### California Statewide

### Resource Adequacy Planning Conventions

<table>
<thead>
<tr>
<th>Resource Adequacy Planning Conventions</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Existing Generation¹</td>
<td>57,897</td>
<td>57,897</td>
<td>57,897</td>
<td>57,897</td>
</tr>
<tr>
<td>2 Retirements (Known)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3 High Probability CA Additions</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4 Net Interchange²</td>
<td>13,118</td>
<td>13,118</td>
<td>13,118</td>
<td>13,118</td>
</tr>
<tr>
<td>5 Total Net Generation (MW)</td>
<td>71,015</td>
<td>71,015</td>
<td>71,015</td>
<td>71,015</td>
</tr>
<tr>
<td>6 1-in-2 Summer Temperature Demand (Average)³</td>
<td>57,125</td>
<td>59,726</td>
<td>60,350</td>
<td>59,419</td>
</tr>
<tr>
<td>7 Demand Response (DR)</td>
<td>524</td>
<td>524</td>
<td>524</td>
<td>524</td>
</tr>
<tr>
<td>8 Interruptible/Curtailable Programs</td>
<td>1,603</td>
<td>1,603</td>
<td>1,603</td>
<td>1,603</td>
</tr>
<tr>
<td>9 Planning Reserve⁴</td>
<td>28.0%</td>
<td>22.5%</td>
<td>21.2%</td>
<td>23.1%</td>
</tr>
</tbody>
</table>

### Expected Operating Conditions

<table>
<thead>
<tr>
<th>Expected Operating Conditions</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Net Generation (MW)</td>
<td>71,015</td>
<td>71,015</td>
<td>71,015</td>
<td>71,015</td>
</tr>
<tr>
<td>Outages (Average forced + planned)</td>
<td>-2,695</td>
<td>-2,695</td>
<td>-2,695</td>
<td>-2,695</td>
</tr>
<tr>
<td>Zonal Transmission Limitation⁵</td>
<td>-150</td>
<td>-150</td>
<td>-150</td>
<td>-150</td>
</tr>
<tr>
<td>Expected Operating Generation with Outages/Limitations⁶</td>
<td>68,170</td>
<td>68,170</td>
<td>68,170</td>
<td>68,170</td>
</tr>
<tr>
<td>Expected Operating Reserve Margin (1-in-2)⁷</td>
<td>24.5%</td>
<td>17.7%</td>
<td>16.2%</td>
<td>18.5%</td>
</tr>
</tbody>
</table>

### Adverse Conditions

<table>
<thead>
<tr>
<th>Adverse Conditions</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Zonal Transmission Limitation</td>
<td>-250</td>
<td>-250</td>
<td>-250</td>
<td>-250</td>
</tr>
<tr>
<td>High Forced Outages (1 STD above average)</td>
<td>-1,160</td>
<td>-1,160</td>
<td>-1,160</td>
<td>-1,160</td>
</tr>
<tr>
<td>1-in-10 Summer Temperature Demand</td>
<td>60,573</td>
<td>63,330</td>
<td>63,992</td>
<td>63,005</td>
</tr>
<tr>
<td>Adverse Scenario Reserve Margin⁷</td>
<td>12.8%</td>
<td>6.7%</td>
<td>5.3%</td>
<td>7.4%</td>
</tr>
<tr>
<td>Adverse Scenario Reserve Margin w/DR and Interruptibles⁸</td>
<td>17.2%</td>
<td>10.9%</td>
<td>9.4%</td>
<td>11.6%</td>
</tr>
<tr>
<td>Resources needed to meet 7.0% Reserve (W/DR &amp; Interruptibles)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Surplus Resources Above 7.0% Reserve (W/DR &amp; Interruptibles)</td>
<td>4,923</td>
<td>1,972</td>
<td>1,264</td>
<td>2,320</td>
</tr>
<tr>
<td>Existing Aging Generation Without Capacity Contracts⁹</td>
<td>-2,070</td>
<td>-2,070</td>
<td>-2,070</td>
<td>-2,070</td>
</tr>
</tbody>
</table>
2007 Preliminary Outlook - Probability of meeting reserve margins for CA ISO Control area

- Existing plus proposed additional peakers, demand response, and interruptible load
- Existing resources, demand response, and interruptible load

Operating Reserve Margin

Cumulative Probability

Stage 1
Stage 2
Stage 3
2007 Preliminary Outlook - Probability of meeting reserve margins for CA ISO Control area

- Existing plus proposed additional peakers, demand response, and interruptible load
- Existing resources, demand response, and interruptible load

Operating Reserve Margin

- Stage 1: Demand Response
- Stage 2: Interruptibles
- Stage 3: Firm Load Shedding

Cumulative Probability

- 84.1% (1-in-6)
- 80.5% (1-in-5)
- 94.7% (1-in-19)
- 90.2% (1-in-10)
- 99.7% (1-in-333)
- 98.7% (1-in-77)
2007 Preliminary Outlook - Probability of meeting reserve margins for SP 26

Operating Reserve Margin

- Existing plus proposed additional peakers, demand response, and interruptible load
- Existing resources, demand response, and interruptible load

Cumulative Probability

- Stage 1 Demand Response
  - 59.5% (1-in-2.5)
- Stage 2 Interruptibles
  - 62.6% (1-in-2.7)
- Stage 3 Firm Load Shedding
  - 99% (1-in-100)
  - 93.3% (1-in-15)
Policy Issues that have surfaced

- Generators have complained that Demand Response is not being called often enough.
- Program operators concerned that excessive use of DR and Interruptibles will result in customers dropping out of program.
Summary of CA ISO load Curtailments over the Last 5 years

- Total number of **Firm Load** curtailments that have occurred over last 5 years: 2 (two)
  - March 8, 2004
  - August 25, 2005

- Total number of **Non-Firm** (interruptible) load curtailments that have occurred over the last 5 years: 11 (eleven)
  - 2002 (3) - June 18 (SP 26), July 10, September 3.
  - 2003 (0) -
  - 2004 (4) - March 8 (SP26), May 3 (SP26), July 20 (SP26), September 14 (Humboldt).
  - 2005 (3) - July 21 (SP26), July 22 (SP26), August 25 (SP26).
  - 2006 (1) - July 24.
Summary of CA ISO load Curtailments over the Last 5 years

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Events</th>
<th>MOW greater than Curtailment</th>
<th>Forecast Deviation greater than Curtailment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2003</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2004</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2005</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2006</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Policy issues to consider:

- How can we tell when the number of load curtailments is excessive?

- Because DR and Interruptibles do not reduce the probability of emergencies being called,
  - Is the CA ISO getting a bad rap?
  - Is the public being alerted when there may not be a true emergency?

- What are some possible options to address these issues?
Possible option to reduce number of emergencies: *Add More Generation*

- Increase Resource Adequacy requirements.
- Change Planning criteria from 1-in-2 to 1-in-10.

□ Pros: - Provides more generation.  
- Increases reserve levels at all times.

□ Cons: - Additional cost (at all times).  
- Resources not likely to be used frequently.  
- Likely to have only minimal effect on reducing the number of emergencies as most emergencies declared with additional generation available.
Possible option to reduce number of emergencies: Add More DR and Interruptibles

- Direct LSE’s to expand DR and increase number of Interruptible customers.

  □ Pros: - Provides greater reserve margins once emergency is called.
            - Reduces need for additional generation resources.

  □ Cons: - Additional cost (at all times).
            - Likely to have minimal effect on reducing the number of emergencies as resources are called after an emergency is declared.
Possible option to reduce number of emergencies: Change tariffs

- Change DR and/or Interruptible tariffs to allow use before emergency is declared.

  □ Pros:  - Reduces probability of emergencies being called.
            - Better Alignment of these resources with Loading Order.
            - Public is altered less, only for true emergencies and may be more apt to respond.

  □ Cons:  - May increase the frequency of use of these resources.
            - May reduce customer participation.
Questions that might provide additional insight:

- How many *hours* have interruptibles been called over the last 5 years?

- How many times has *an individual customer* been interrupted over the last 5 years?

- How have customers’ *interruption histories compared with their agreements*?

Staff efforts are ongoing to gather additional information and data.