California Electric Market: Overview and Focal Points

Overview

Geography

States covered: California (most of) and northern Baja California (Mexico)

Reliability region: California-Mexico Power Area (CAMX) sub-region of the Western Electric Coordinating Council (WECC)

Balancing authorities: California ISO (CAISO), Sacramento Municipal Utility District (SMUD), Turlock Irrigation District (TID), Los Angeles Department of Water and Power (LADWP), and Comision Federal de Electricidad (CFE).

Approximately 80% of demand in the CAMX subregion is within the area of the CAISO balancing authority. The portion of the CAMX area within Mexico is comparatively small. The remaining 20% of California’s load is managed primarily by municipal utilities and irrigation districts such as the Los Angeles Department of Water and Power, the Sacramento Municipal Utility District, and the Imperial Irrigation District.

CAISO zones: NP-15, ZP-26, SP-15

RTO/ISO

California ISO (CAISO) (established 1998) operates the region’s power grid and wholesale electric markets:

- Real-time imbalance energy,
- Ancillary services, and
- Transmission usage.

CAISO 2008 State of the Markets Report
Market Monitor: Keith Casey – Director, Department of Market Monitoring

Updated May 13, 2008
California Electric Market: Overview and Focal Points

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

Generation/Supply

Marginal fuel type: natural gas

Generating capacity (summer 2006): 56,347 MW

Capacity reserve (summer 2006): 6,077 MW

Reserve margin (summer 2006): 12%

Demand

All time peak demand: 50,270 MW (set July 24, 2006)

System peak loads declined in 2008, due in large part to a generally mild summer

Peak demand change: -3.5% (2007-2008)

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer Peak Demand (MW)</td>
<td>45,597</td>
<td>45,562</td>
<td>50,270</td>
<td>48,615</td>
<td>46,897</td>
</tr>
</tbody>
</table>

Source: Derived from CAISO data.

Load pockets: Humbolt, North Bay, Greater San Francisco Bay, Sierra, Stockton, Los Angeles Basin, and San Diego areas.

Updated April 26, 2007
Prices (CAISO only)

Annual Average Price (ISO Real-time)

NP-15:

2004: $38.35/MWh
2005: $54.39/MWh
2006: $43.17/MWh
2007: $54.44/MWh

SP-15:

2004: $39.47/MWh
2005: $55.57/MWh
2006: $46.50/MWh
2007: $54.45/MWh

Interconnections/Seams

Load serving entities within CAISO rely on imports for approximately one-fourth of their annual energy needs.
# Supply and Demand Statistics for CAISO

<table>
<thead>
<tr>
<th>Supply Demand Statistics</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer Generating Capacity MW (1)</td>
<td>54,038</td>
<td>55,694</td>
<td>56,347</td>
</tr>
<tr>
<td>Summer Peak Demand MW</td>
<td>45,597</td>
<td>45,431</td>
<td>50,270</td>
</tr>
<tr>
<td>Summer Reserves MW</td>
<td>8,441</td>
<td>10,263</td>
<td>6,077</td>
</tr>
<tr>
<td>Summer Reserve Margin:</td>
<td>19%</td>
<td>23%</td>
<td>12%</td>
</tr>
<tr>
<td>Annual Load (GWh):</td>
<td>239,788</td>
<td>236,449</td>
<td>240,259</td>
</tr>
<tr>
<td>Annual Net Generation GWh</td>
<td>178,304</td>
<td>179,188</td>
<td>177,757</td>
</tr>
</tbody>
</table>

Footnote (1): Generation capacity includes dynamically scheduled generation, and excludes any derates of the resources or imports.
### Annual Average Bilateral Prices

#### California Electric Market: Annual Bilateral Prices

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>5-Year Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP15</td>
<td>$54.44</td>
<td>$72.49</td>
<td>$61.08</td>
<td>$66.59</td>
<td>$80.14</td>
<td>$66.95</td>
</tr>
<tr>
<td>SP15</td>
<td>$55.18</td>
<td>$73.04</td>
<td>$61.95</td>
<td>$66.48</td>
<td>$79.36</td>
<td>$67.20</td>
</tr>
</tbody>
</table>

Source: Derived from *Platts* data.

Updated February 6, 2009
California Electric Market: Western Bilateral Prices

Western Daily Bilateral Day-Ahead On-Peak Prices

Source: Derived from Platts data.

Updated November 6, 2009
Southwestern Daily Bilateral Day-Ahead On-Peak Prices

Source: Derived from Platts data.

Updated November 6, 2009
California Electric Market: Northwestern Bilateral Prices

Northwestern Daily Bilateral Day-Ahead On-Peak Prices

Source: Derived from Platts data.

Updated November 6, 2009
California Electric Market: Last Month’s Western Bilateral Prices

Western Daily Bilateral Day-Ahead On-Peak Prices

Source: Derived from Platts data.

Updated November 6, 2009
Southwestern Daily Bilateral Day-Ahead On-Peak Prices

Source: Derived from Platts data. Updated November 6, 2009
Northwestern Daily Bilateral Day-Ahead On-Peak Prices

Source: Derived from Platts data.

Updated November 6, 2009
California Electric Market: Western Implied Heat Rates

Implied Heat Rates at Western Trading Points
Weekly Averages

Source: Derived from Platts on-peak electric and natural gas price data.

Updated November 6, 2009
Western Daily Actual Peak Demand


Updated November 6, 2009
California Electric Market: Generation Output and Temperatures

Weekly Electric Generation Output and Temperatures California

Source: Derived from EEI and NOAA data.

Updated November 6, 2009
Pacific Northwest Hydroelectric Production

Source: Derived from USACE data reflecting the output of the 24 largest facilities. Trend lines are 7-day moving averages.

Updated November 6, 2009
California Electric Market: Physical & Financial Market Volumes

SP-15 Forward and Swap Volumes

Source: Derived from ICE and Nymex ClearPort. ICE on-peak forward (physical) and swap (financial) volumes are for SP-15 and include monthly, dual monthly, quarterly, and calendar year contracts traded for each month. Nymex ClearPort on-peak swap (financial) volumes are for the SP-15 Hub traded by month.

Updated November 6, 2009