



CALIFORNIA ISO

California Independent
System Operator

Market Update

Events of July-August 2005

Market Surveillance Committee Meeting
September 22, 2005

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***July load growth due to extraordinarily long heat wave;
August may indicate return to intrinsic growth trend***
Load Growth Rates Compared with Same Month Prior Year

| | <u>Avg. Hrly. Load</u> | <u>Avg. Daily Peak</u> | <u>Avg. Daily Trough</u> | <u>Monthly Peak</u> |
|--------------|------------------------|------------------------|--------------------------|---------------------|
| September-04 | 3.4% | 3.5% | 3.4% | 10.1% |
| October-04 | -1.4% | -2.8% | 1.5% | -5.9% |
| November-04 | 4.2% | 3.9% | 3.9% | 6.6% |
| December-04 | 4.4% | 4.1% | 6.5% | 3.4% |
| January-05 | 1.8% | 2.8% | 1.2% | 5.0% |
| February-05 | 1.5% | 1.8% | 2.2% | 0.3% |
| March-05 | -2.3% | -2.2% | -0.6% | -5.2% |
| April-05 | -2.2% | -3.6% | -0.3% | -22.9% |
| May-05 | -2.5% | -2.9% | -1.1% | -9.3% |
| June-05 | -2.5% | -3.8% | 0.4% | 2.7% |
| July-05 | 5.6% | 6.2% | 5.1% | 3.9% |
| August-05 | 4.3% | 5.1% | 4.1% | -1.5% |



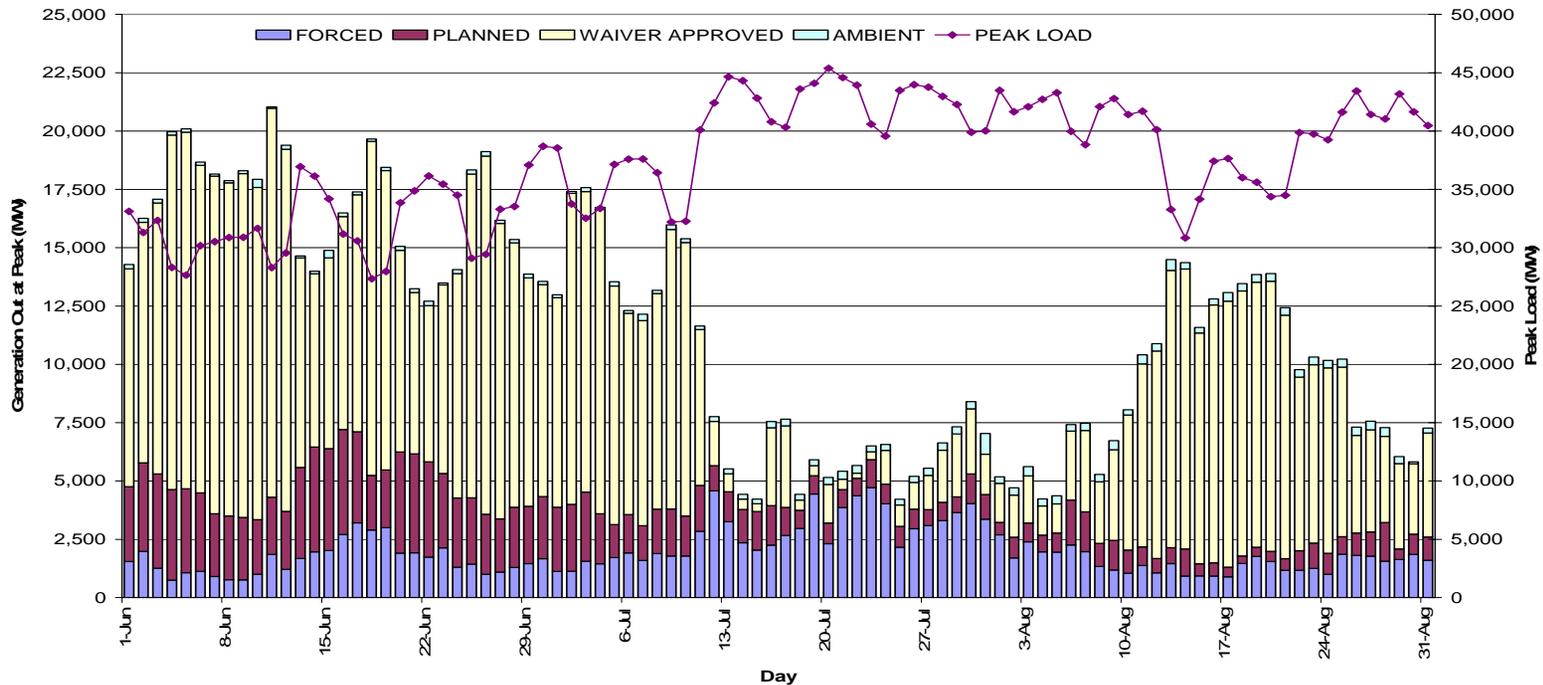
Long, Hot July

- Loads peaked above 40,000 MW on all days between July 11 and August 6, except for two Sundays
- Peak load of 45,431 MW on July 20 was approx. 300 MW shy of 2004 peak, but represents greater per-capita load when accounting for change in ISO footprint
- Coastal areas were relatively cool
- Prolonged high loads lead to increased instances of forced outages of control area generation resources in late July
- High load periods resulted in real-time Path 26 congestion
 - Incremental real-time energy dispatch in SP26 (higher MCP)
 - Decremental dispatch in NP26 (lower MCP)
- SP26: new record 26459 MW, set July 21; previous was 25743 MW
- July 22 Emergency



With prolonged high loads, entire generation fleet was running continuously for weeks, resulting in many forced outages

Outages by Type vs. Actual Load in Peak Hour For Each Day in June through August 2005





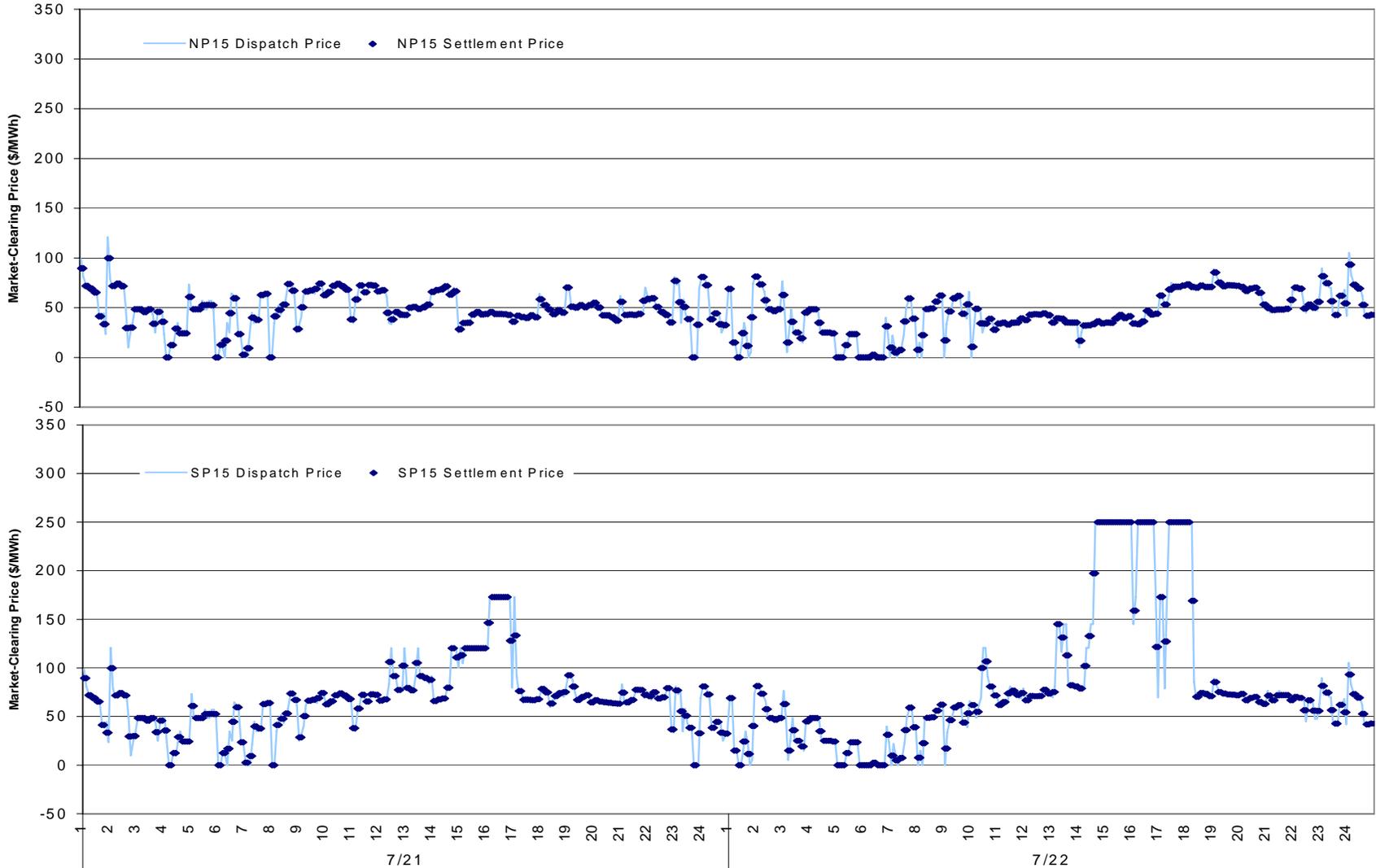
July 22 Stage 2 Emergency

- SP15 Load 26,439 MW (approx. 20 MW below record set 7/21)
- Large unit in Utah tripped offline
- Several internal units had already been forced out due to lack of maintenance
- SP15 MCP \$249.99/MWh, set by CTs, while decrementing in NP15 to relieve Path 26 congestion
- Some nonfirm load was curtailed



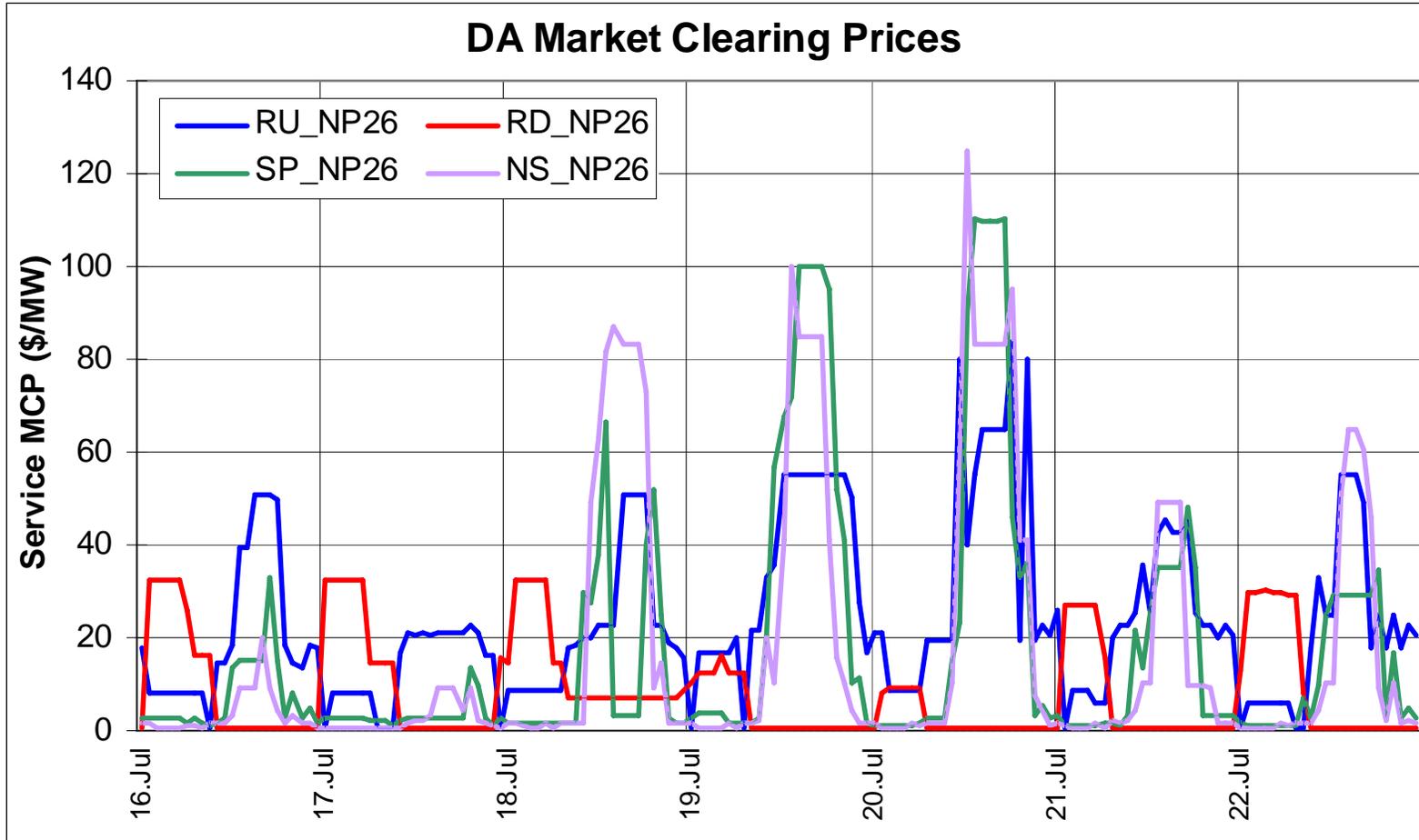
SP15 Price Spikes accompanied Stage 2 Emergencies on July 21-22

Five-Minute NP15 (Top) and SP15 (Bottom) RTMA In-Sequence Prices: 21-Jul through 22-Jul





**Price response to heavy loads and full energy schedules;
Spin and Non-Spin season high prices coincide with the
system peak load day on July 20th.**





August generally mild but saw two extraordinary events

- Moderate weather August 7-22, followed by high loads through August 29
- August 25 Blackout
- Hurricane Katrina on 8/31 caused national gas prices to spike above \$12/MMBtu (California prices peaked above \$10/MMBtu)



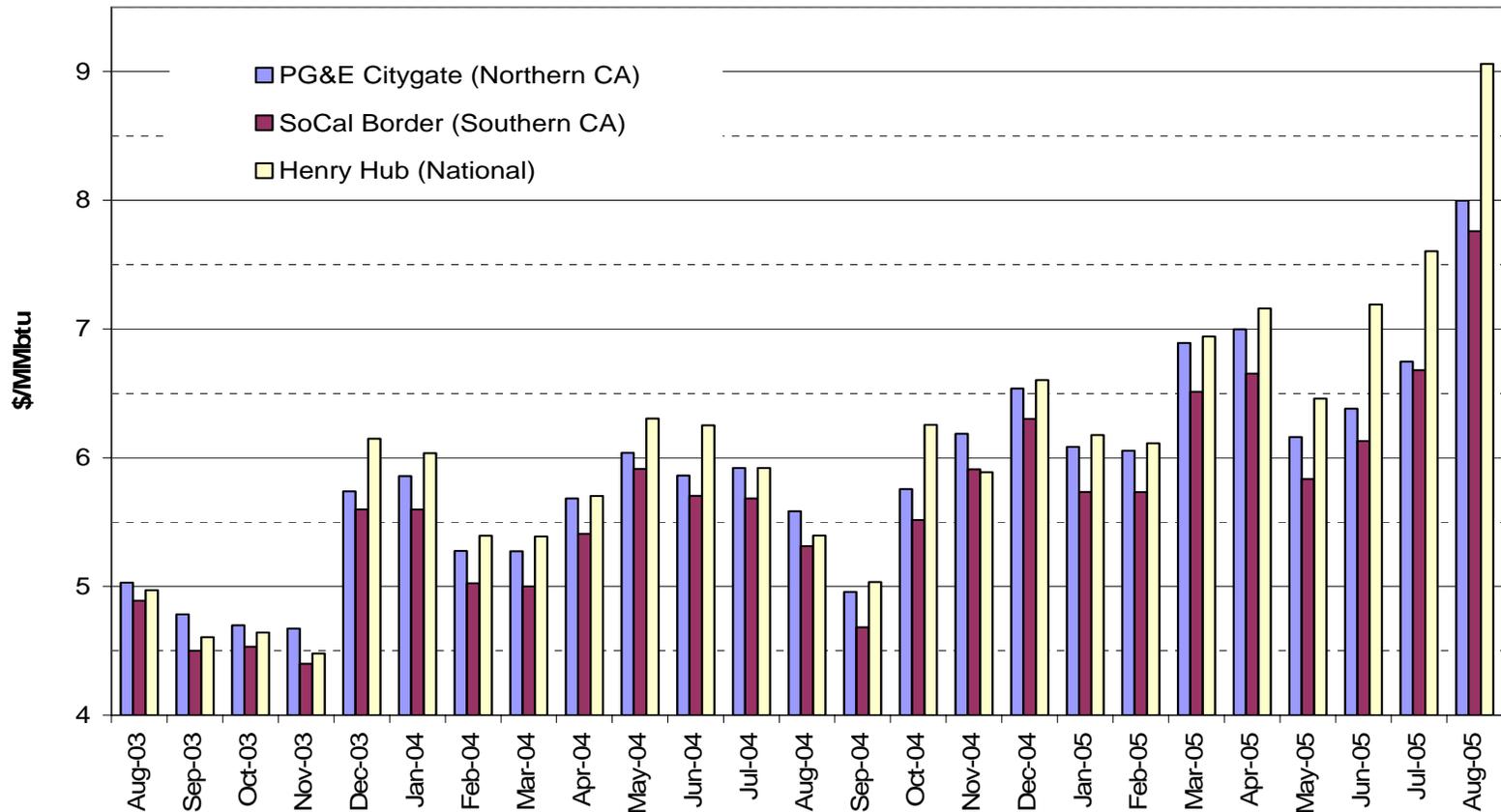
August 25 Load Shedding

- SP26 peak: 24591 MW @ 1611
 - Forecast peak 22315 MW; actual weather 14 degrees above forecast
 - Actual load was about 2000 MW below July peak
- 1530: Reserves fell below 7%; approx. 60% of reserves were procured in NP26, most were undeliverable to SP26 (approx. 400 MW throughput available after hour-ahead scheduling)
- 1547: PDCI (2335 MW) lost due to converter block
- 1551: ISO requested that SCE shed nonfirm load (approx. 800 MW)
- 1552: Transmission emergency declared
- 1553-1554: ISO requested that SCE shed 800 MW firm and SDG&E shed 100 MW firm, smaller amounts from Munis
- Meanwhile, RTMA SP15 MCP peaked at \$120.92/MWh. This is under investigation.
- Recovered within approximately 30 minutes



Gas spot prices and futures escalating due to heat and concerns of hurricane-driven production outages

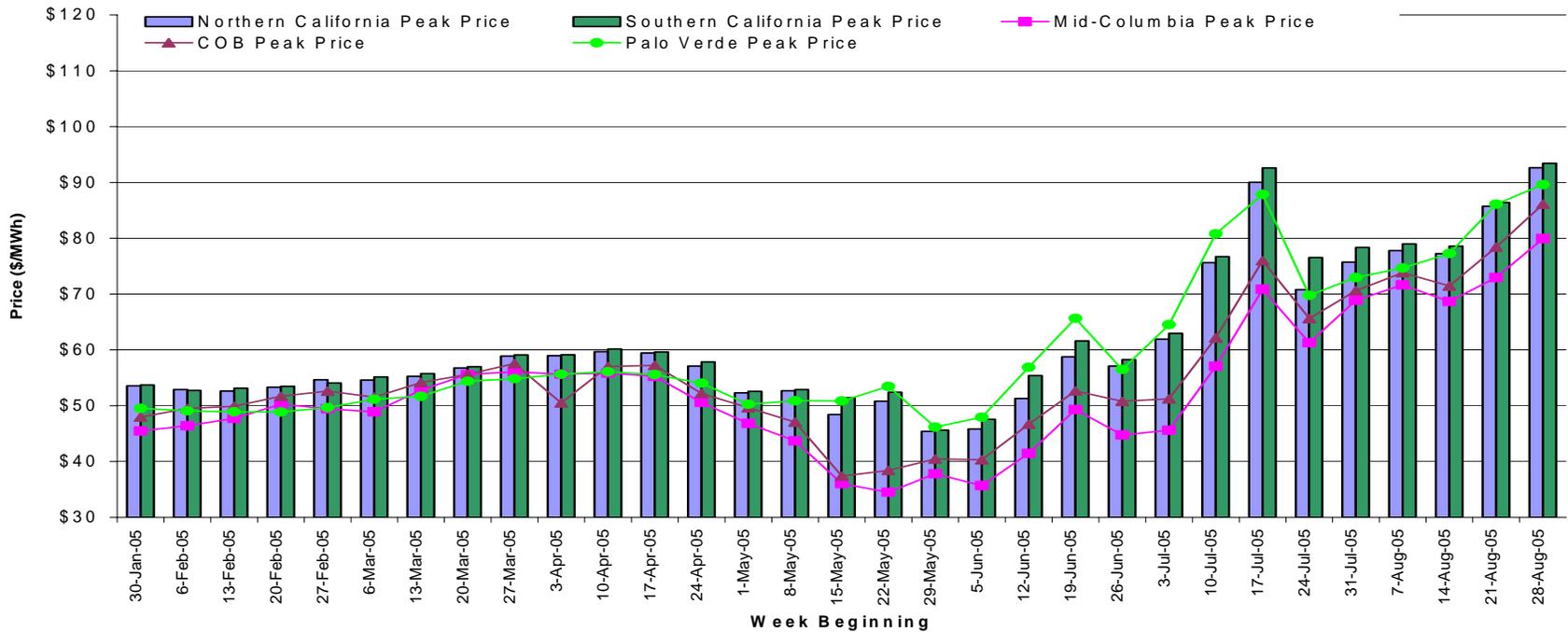
Average Monthly Gas Prices through August-05





**July increase in bilateral and real-time prices driven largely by demand.
August spike driven by supply (gas prices):
Marginal cost of power with \$10 gas is approximately \$100/MWh**

Regional Day-Ahead Forward Electric Prices – Weekly Averages





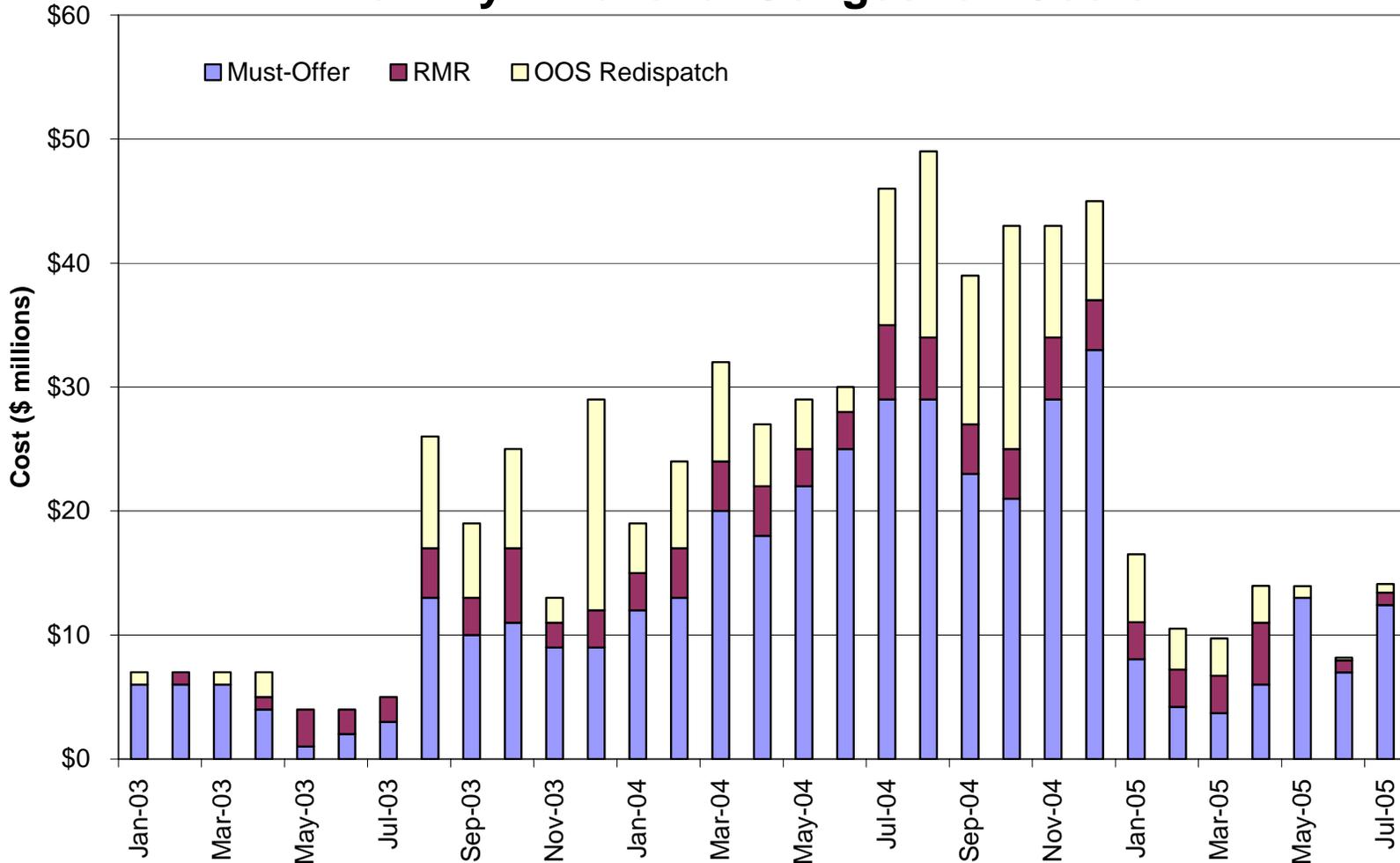
Improvements in the Markets

- Intrazonal congestion decreased nearly 60% between 2004 and 2005 as a result of transmission infrastructure upgrades. Interzonal congestion costs similar to last year, despite higher loads (\$4.2 million in June and \$4.5 million in July)
- Ancillary services bid sufficiency improved
 - More capacity online to meet high loads
 - Prices increase in response to high loads



Intrazonal congestion costs down 60 percent from last year

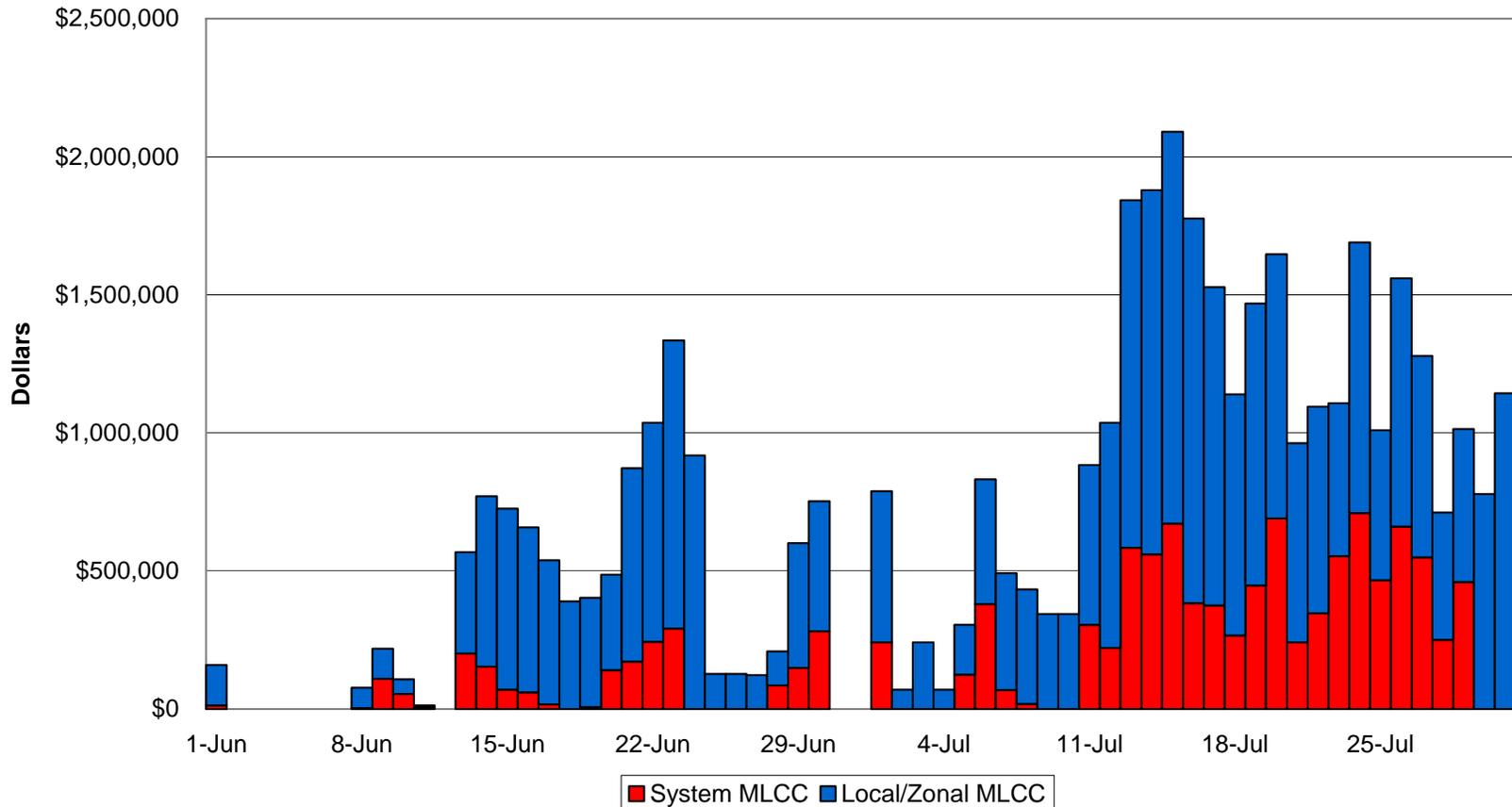
Monthly Intrazonal Congestion Costs





Must-Offer Commitment Costs Increased Significantly in July as a result of high loads and short DA Schedules

June and July Daily MLCC by Type





Significant increase in MLCC "System" Costs in July resulting in higher costs allocated to underscheduled load

Monthly System MLCC vs. Charge Type 1697 Price (\$/MWh)

