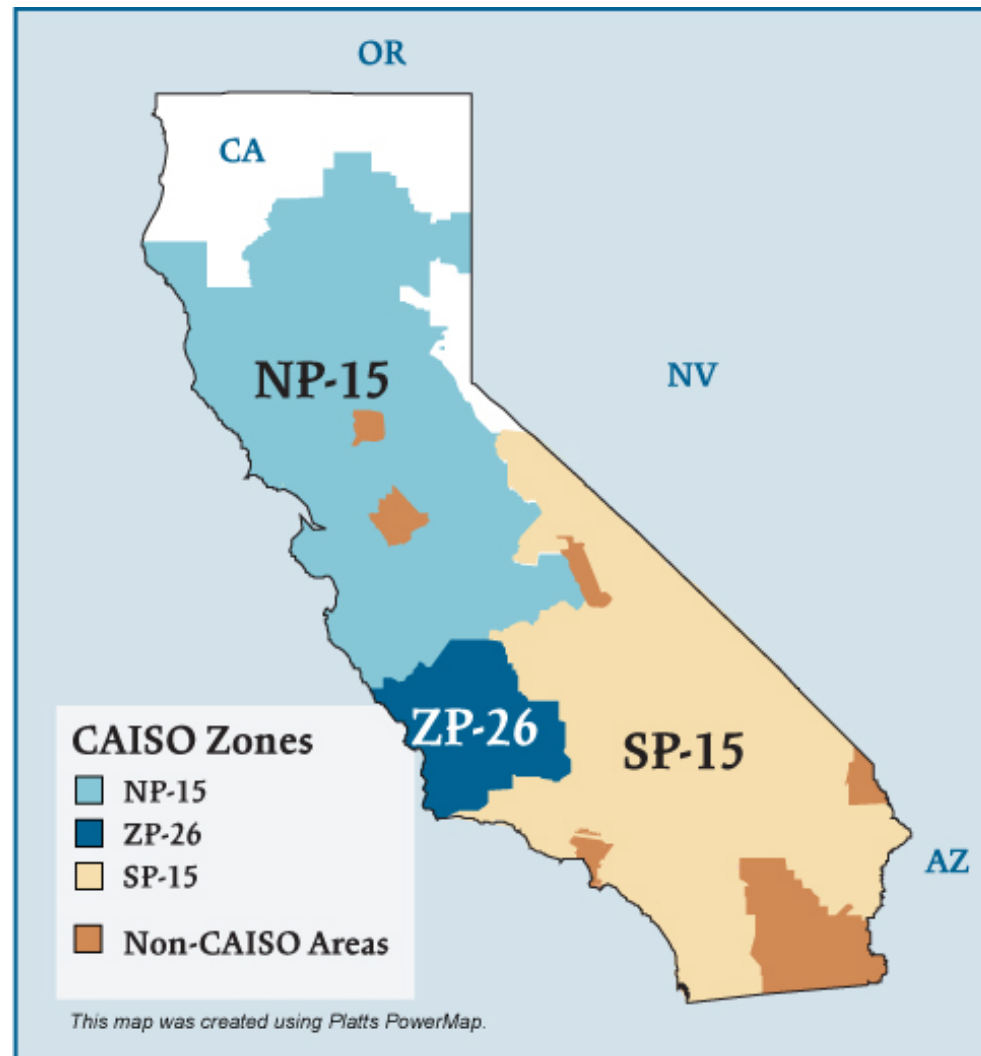


## California (CAISO) Electric Regions



**Federal Energy Regulatory Commission • Market Oversight @ FERC.gov****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 2006 State of the Markets Report](#)

Market Monitor: Keith Casey – Director, Department of Market Monitoring

*Updated August 3, 2007*

1002

## 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)

In July 2006, CAISO experienced an extreme heat wave that resulted in new records for peak loads and for temperatures across the state.

Peak demand growth: 10.7% (2006-2005)

	2004	2005	2006
Summer Peak Demand (MW)	45,597	45,431	50,270

Source: Derived from CAISO data.

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

**Prices (CAISO only)**

## Annual Average Price (ISO Real-time)

## NP-15:

2004: \$38.52/MWh

2005: \$54.25/MWh

2006: \$43.38/MWh

## SP-15:

2004: \$39.64/MWh

2005: \$55.52/MWh

2006: \$46.84/MWh

Prices increased in 2005 as a result of disturbances to the natural gas market. Prices declined in 2006 as natural gas storage levels remained above historical ranges throughout the injection season (April through October).

**Interconnections/Seams**

Load serving entities within CAISO rely on imports for approximately one-fourth of their annual energy needs.

## Focal Points

**Price Differences:** California ISO real-time prices differed from bilateral spot markets in 2006. Last year, average on-peak prices for CAISO real-time imbalance energy (\$48/MWh) were lower than bilateral spot prices (\$57/MWh). A recent CAISO study found that overscheduling of power deliveries required the majority of real time dispatches to reduce output. These decremental dispatches resulted in the lower real time prices. The new Market Redesign and Technology Upgrade (MRTU), to be implemented in 2008, is to contain mechanisms that are intended to improve day-ahead and real time price convergence.

**CAISO Bid Cap:** On January 14, 2006, CAISO raised the bid cap for its real-time imbalance energy market from \$250/MWh to \$400/MWh. The Commission approved this proposal in response to CAISO concerns that having the bid cap remain at \$250/MWh might result in reduced bid volumes with gas prices on the rise as was occurring in the fall of 2005. (Both the previous and revised bid caps were “soft,” where a soft bid cap permits market participants to submit bids above the cap subject to cost justification, but such bids are not allowed to set the market clearing price.)

## Focal Points

**Heat Wave Loads:** In late July 2006, load records were set in regions covered by the California Independent System Operator (CAISO), Los Angeles Department of Water and Power (LADWP), and Sacramento Municipal Utility District (SMUD). A severe heat wave resulted in 100+ degree temperatures over most of the state, with some areas topping 110 degrees. California's utilities, the CAISO, and state officials urged consumers to conserve. CAISO declared a Stage 2 Emergency (calling for conservation) on July 24 when operating reserves dropped below 5 percent, which allowed CAISO to direct participating utilities to curtail nonfirm load and customers on interruptible programs.

Conservation efforts, curtailed load, and distribution system outages kept peak load under the 52,000 MW that CAISO anticipated that date, with the peak actually reaching 50,270 MW on July 24. No curtailment of nonfirm load was needed.

Power prices in the bilateral markets, where the majority of incremental power needs are met in California, rose to more than \$350/MWh. CAISO real-time prices rose to nearly \$400/MWh (which is the current soft bid cap in the real-time imbalance energy market) intermittently throughout the days of the almost two-week-long heat wave. High levels of day-ahead and hour-ahead scheduling occurred in CAISO as utilities and other load serving entities implemented the state's new resource adequacy requirements, which were set in June. Volumes in CAISO's real-time energy market were relatively moderate over the critical peak hours.

## Supply and Demand Statistics for CAISO

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

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

## Annual Average Bilateral Prices

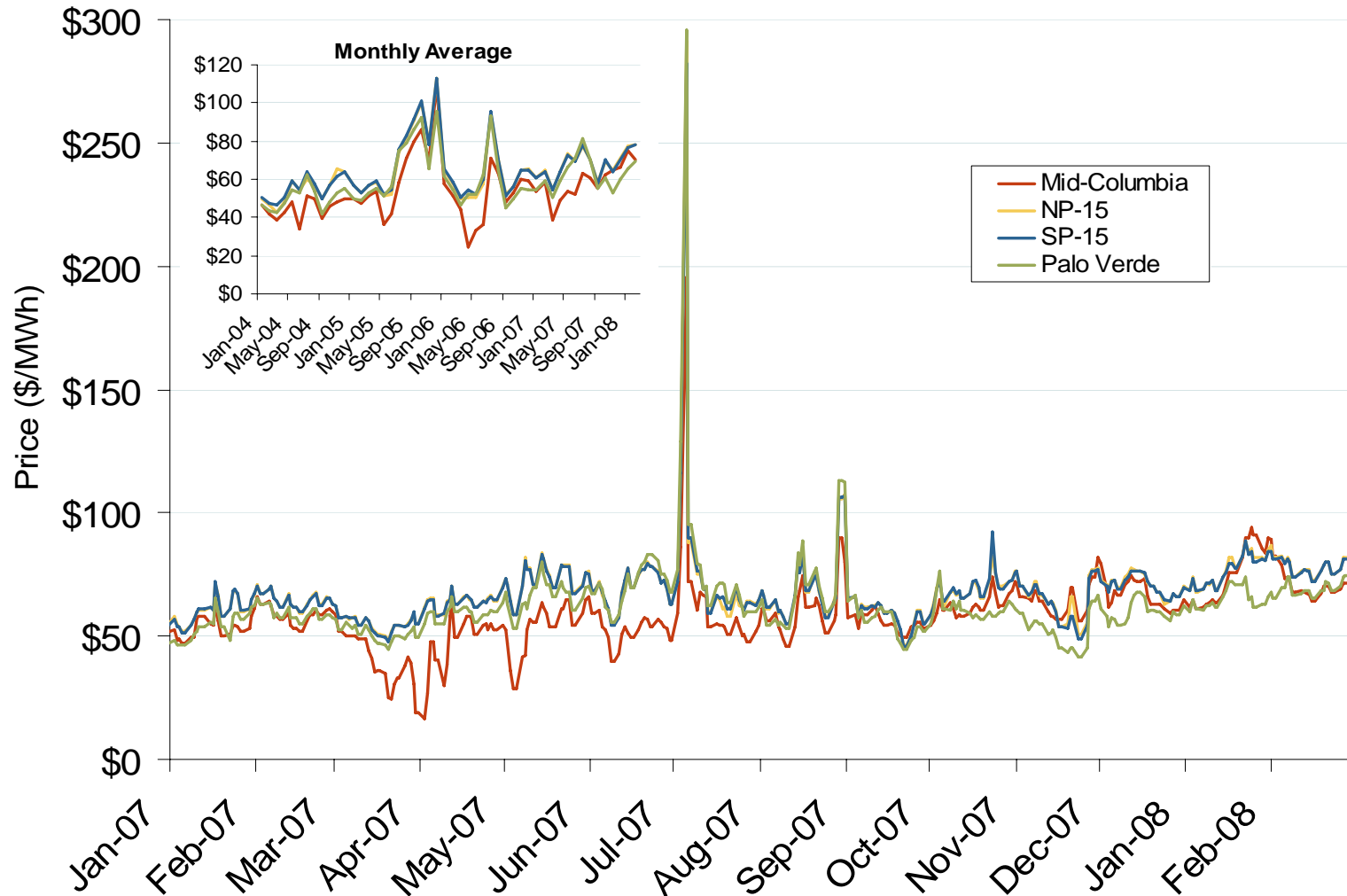
Annual Average Day Ahead On Peak Prices (\$/MWh)				
	2005	2006	2007	5 Years
NP15	\$72.49	\$61.08	\$66.59	\$60.72
SP15	\$73.04	\$61.95	\$66.48	\$61.57

Source: Derived from *Platts* data.

Updated March 7, 2008



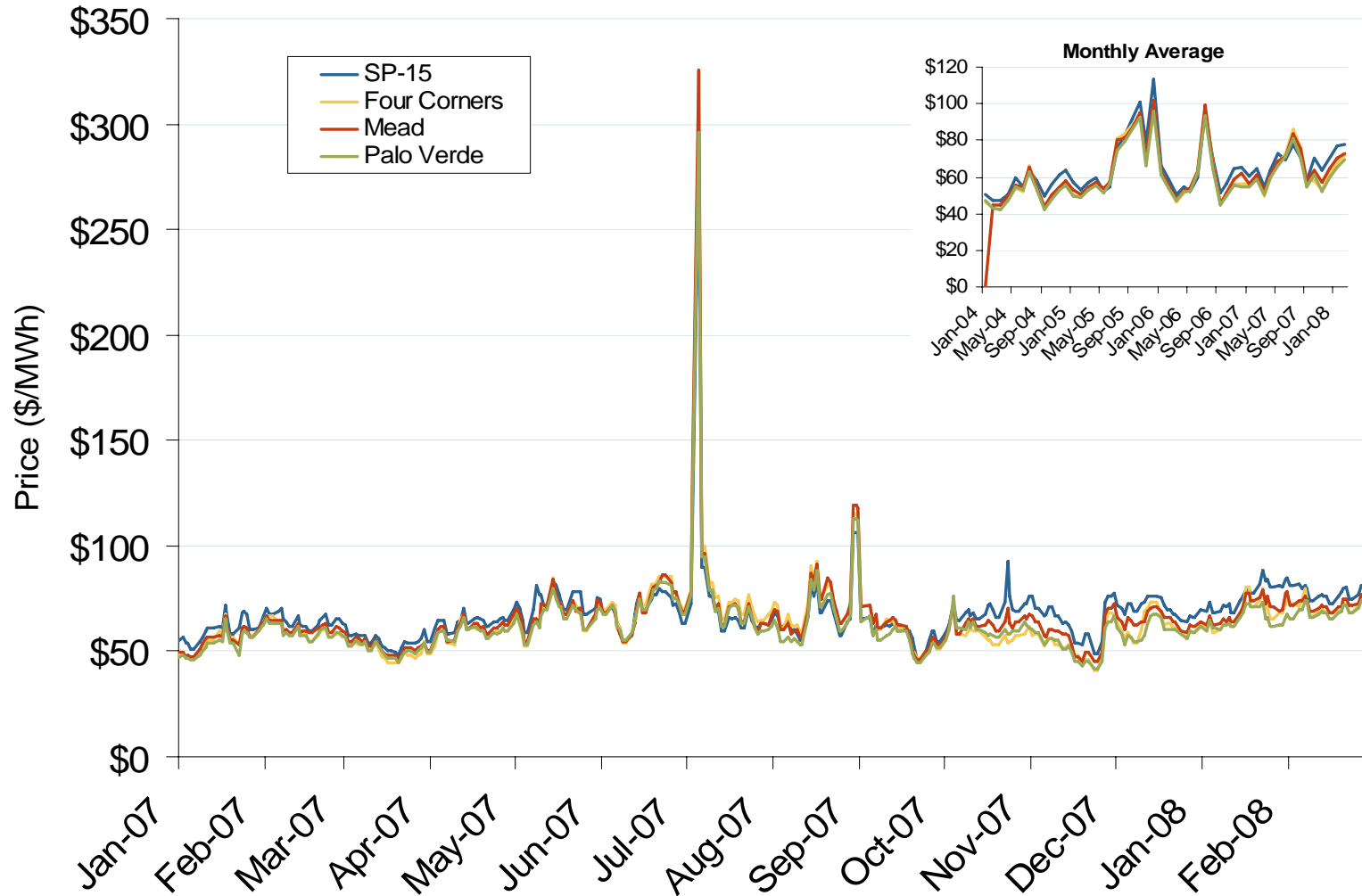
## Western Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

Updated March 7, 2008

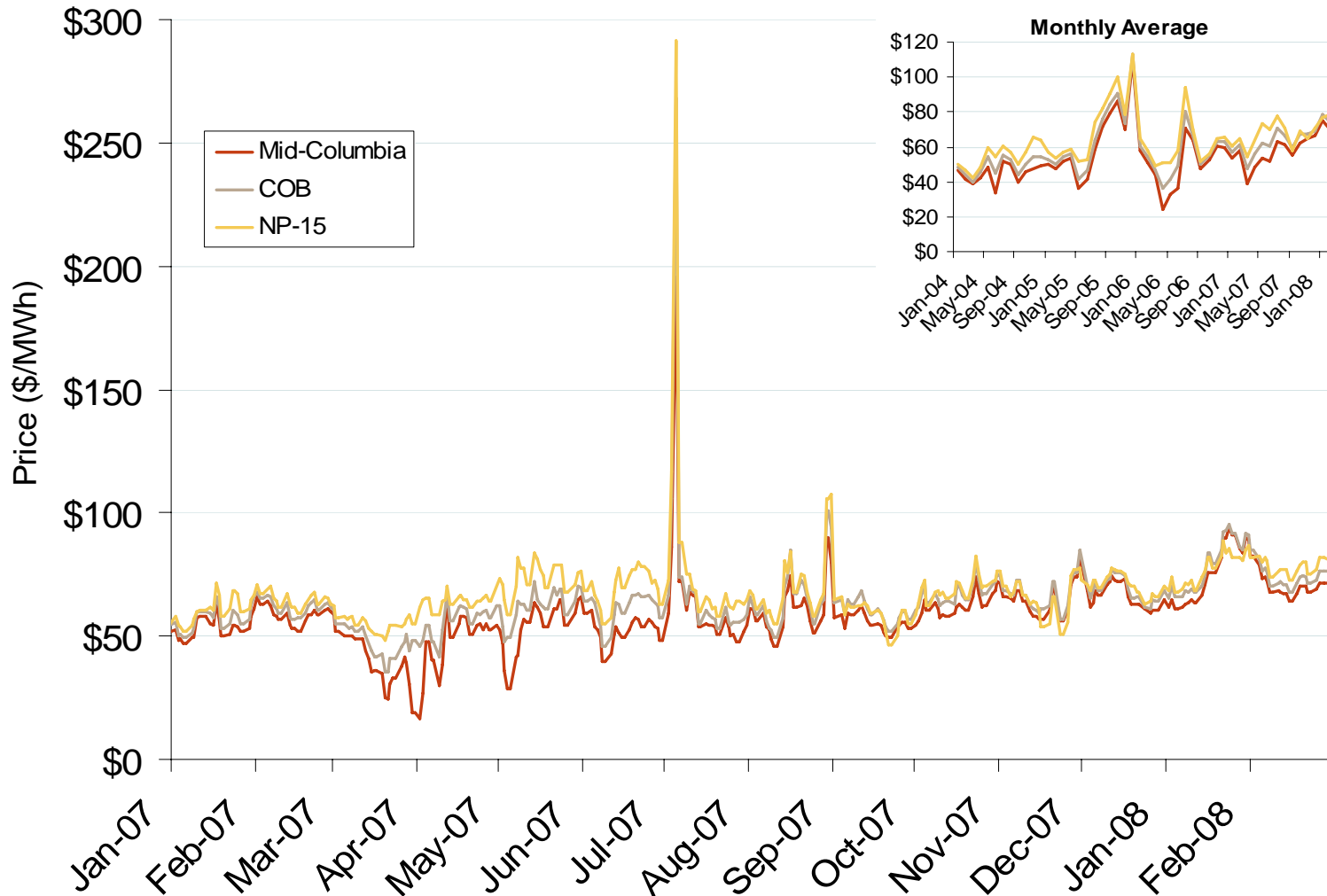
# Southwestern Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

Updated March 7, 2008

# Northwestern Daily Bilateral Day-Ahead On-Peak Prices

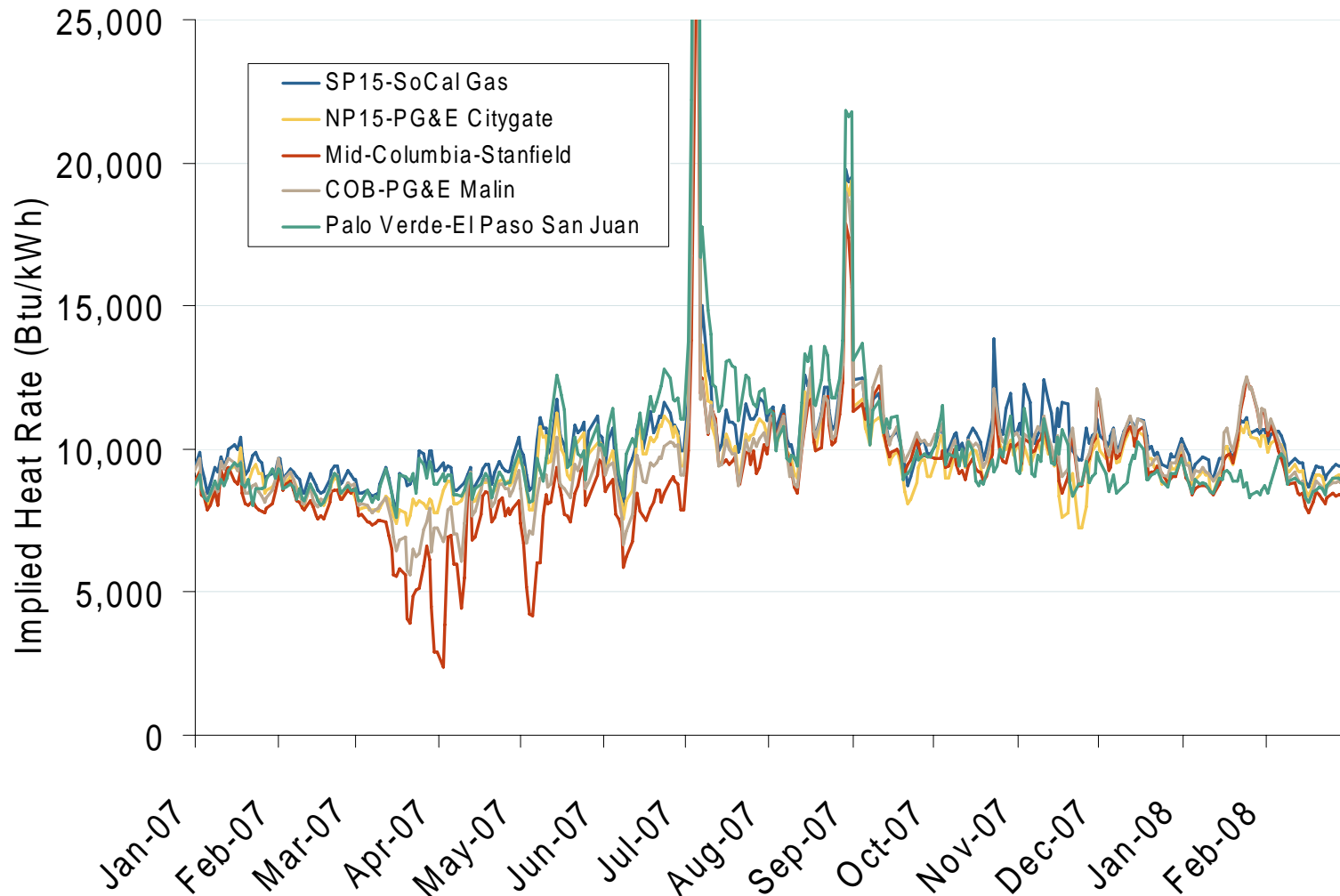


Source: Derived from *Platts* data.

Updated March 7, 2008

1007

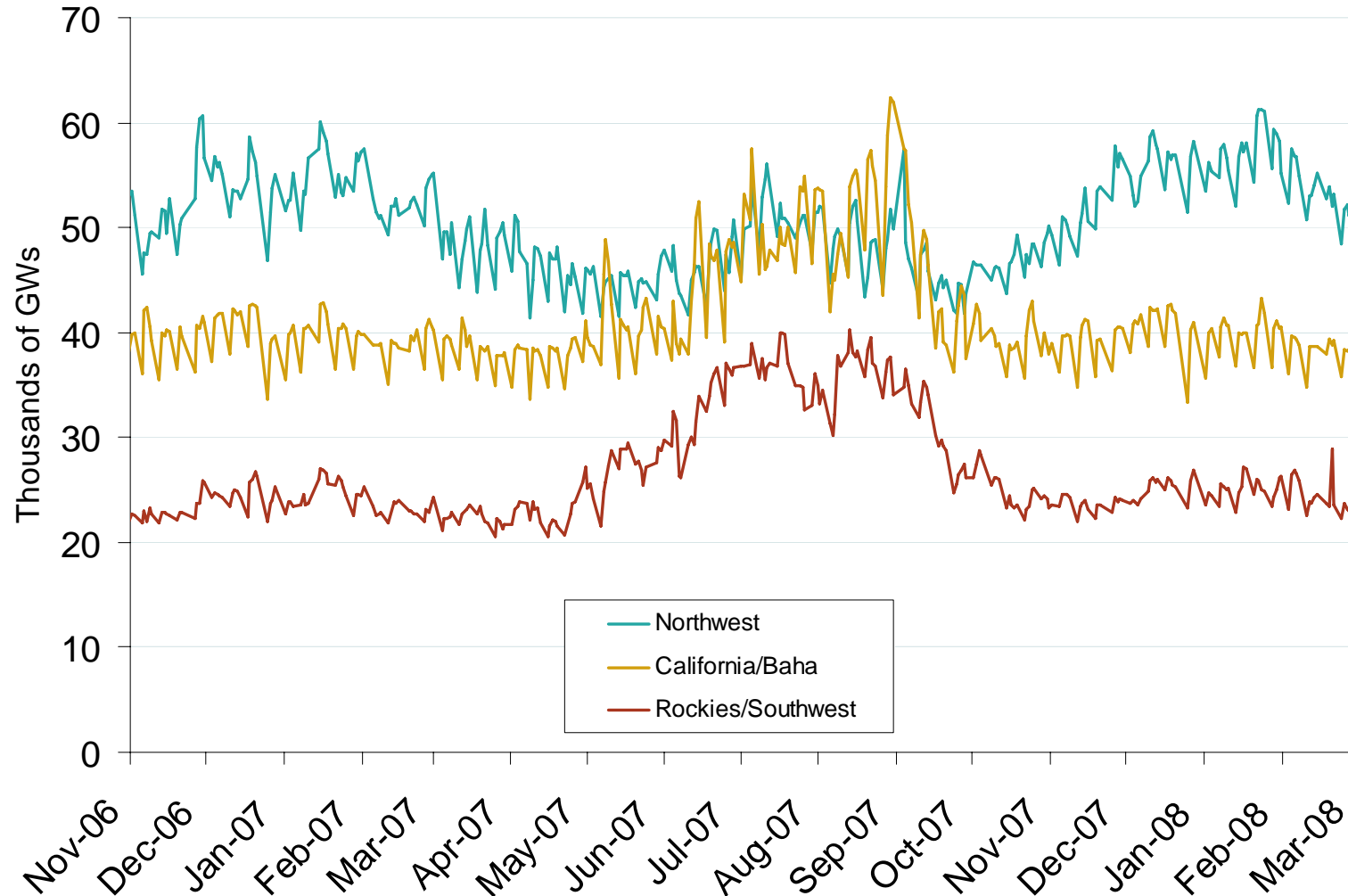
## Implied Heat Rates at Western Trading Points



Source: Derived from *Platts* data

Updated March 7, 2008 1143

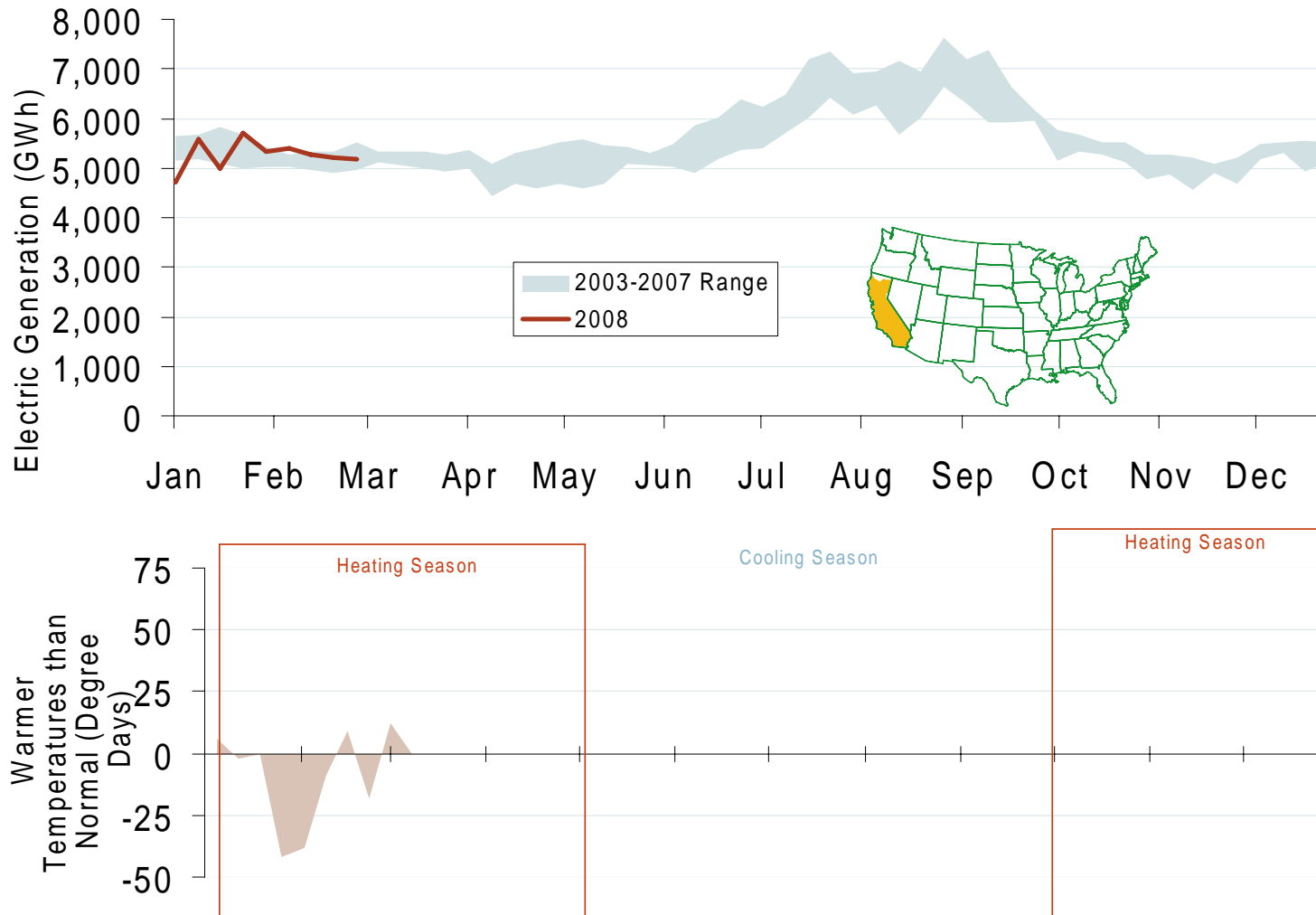
## Western Daily Actual Peak Demand



Source: Derived from WECC Daily Report data available at <http://wecc.biz>. Data shown is generally Sunday through Thursday due to limitations of daily reports.

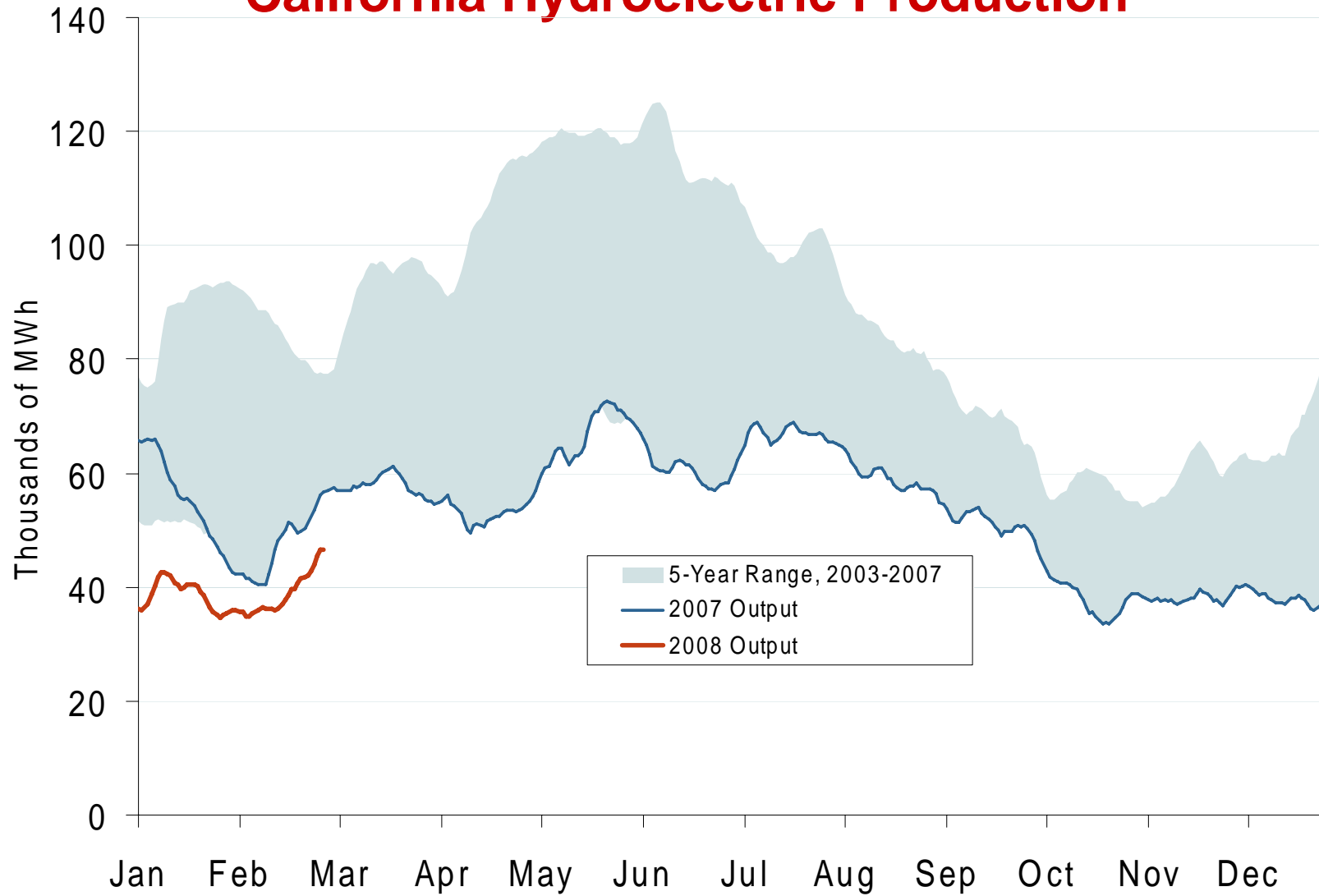
Updated March 7, 2008

# Weekly Electric Generation Output and Temperatures California



Source: Derived from EEI and NOAA data.

# California Hydroelectric Production



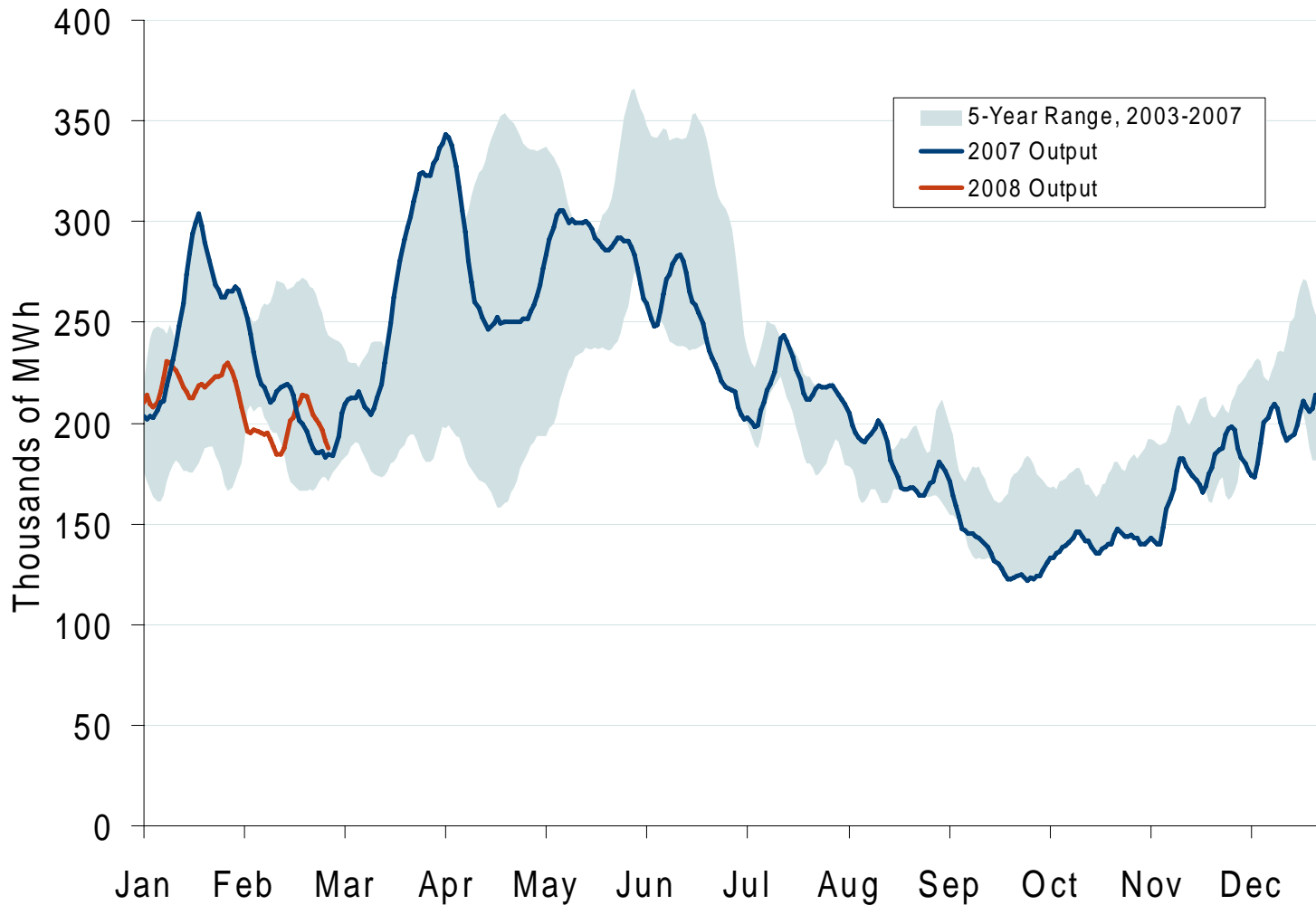
Source: Derived from CAISO data.

Trend lines are 7-day moving averages.

Updated March 7, 2008

1104

## Pacific Northwest Hydroelectric Production

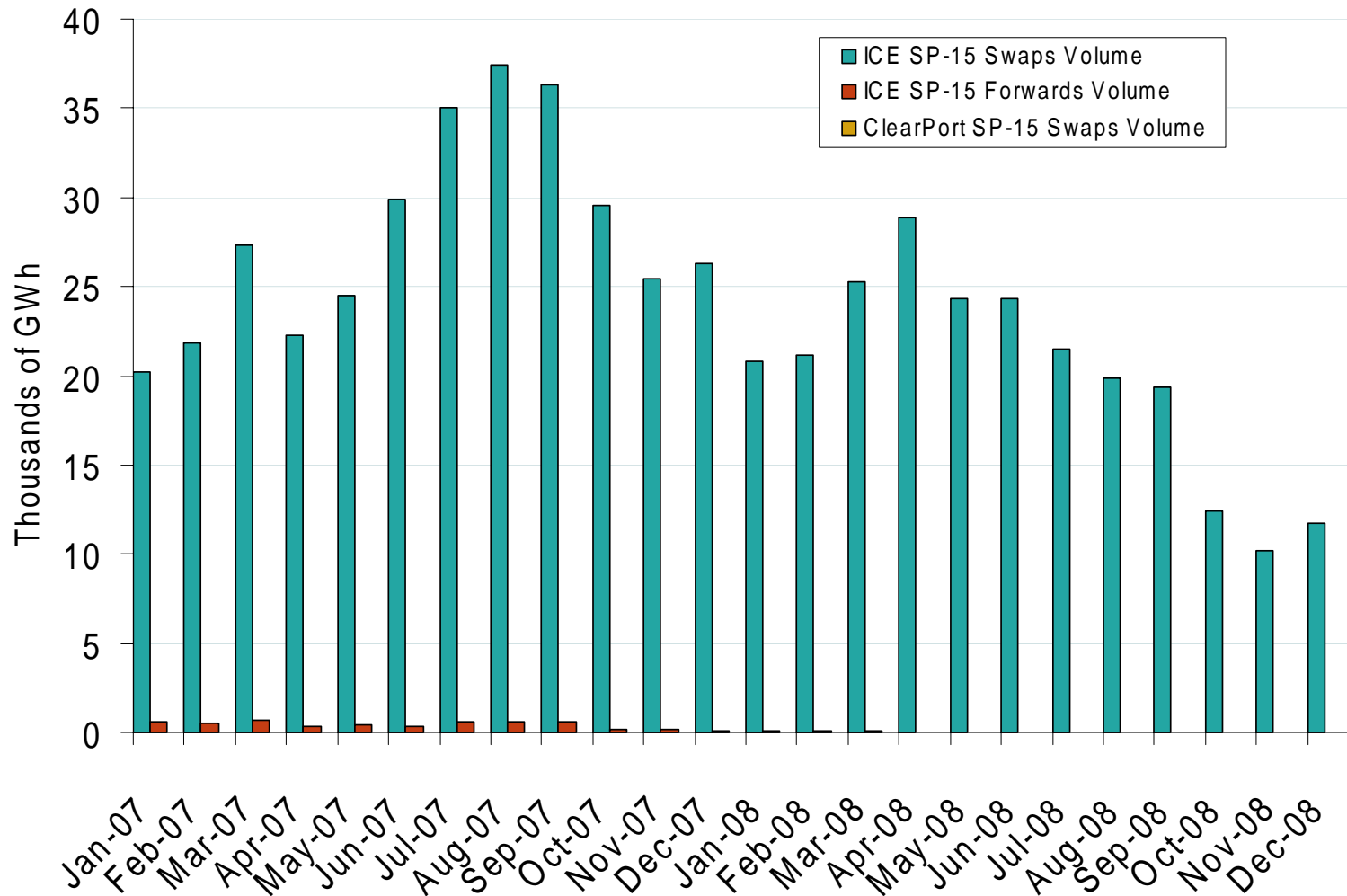


Source: Derived from USACE data reflecting the output of the 24 largest facilities.  
Trend lines are 7-day moving averages.

Updated March 7, 2008



## 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 March 7, 2008