

## Memorandum

To: ISO Governing Board  
From: Alan Isemonger, Manager Market Information  
Date: April 12, 2007  
Re: **Market Performance Report – February 2007**

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*This memorandum is a status report and does not require Board action.*

The complete Market Performance Report for February 2007 can be found online at <http://caiso.com/1baa/1baa7f5c1fb70.pdf>

### EXECUTIVE SUMMARY

#### Highlights for February 2007:

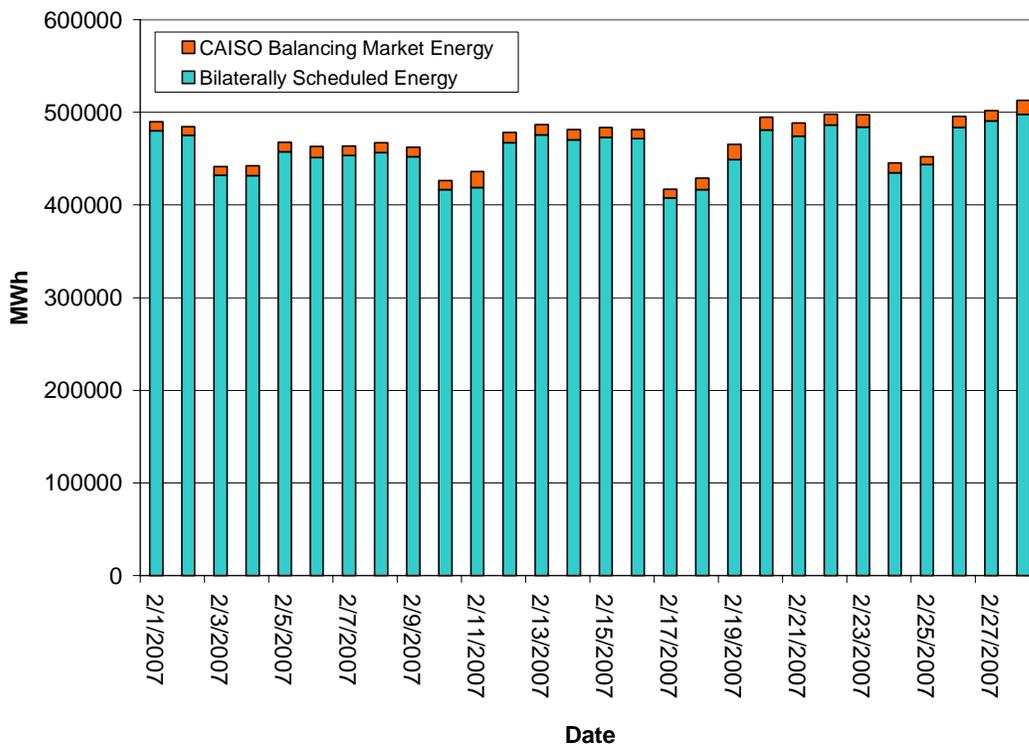
- February loads were up only slightly from the previous year. Cold weather during the last week raised the system load somewhat, but that increase was partially offset by somewhat lighter than normal loads in the earlier part of the month.
- Overall real-time energy prices increased from \$47.25 to \$51.25 as decremental volumes increased and incremental volumes declined.
- On average, real-time dispatch prices were less volatile in February exceeding \$250 on 50 occasions (0.6% of the time) as compared to 102 in January. Most of February's price events (26 out of 50) occurred on February 19<sup>th</sup>, and 27<sup>th</sup> because of a series of transmission line events.
- February's incremental Out-of-Sequence dispatch volumes declined by 28 percent to 30,000 MWh, and incremental costs decreased by a quarter to \$1.8 million. Decremental volumes and costs increased by approximately 16 percent to 33,000 MWh and by 67 percent to \$220,000, respectively. The ISO continues to rely on OOS dispatches to manage reliability in the Humboldt region where a number of RMR contracts expired at the end of 2006.
- The average total cost of Ancillary Services decreased again in February to \$0.40 from January's \$0.54.
- Total unit commitment costs declined in February to \$1.9 million from \$2.7 million in January. Local generation requirements were responsible for about two thirds of this month's costs, while transmission line maintenance account for most of the remainder.
- Total inter-zonal congestion costs fell to \$1.8 million in February from \$4 million in January. This is well below the average cost over the past 12 months of \$4.5 million.

# Market Performance Metrics

## Real-Time Balancing Energy Market

The CAISO real-time energy market is a balancing market, in that it serves to provide energy to balance the power system, matching generation to load. A balancing market provides merely the difference between scheduled generation and actual load. The California ISO does not participate in the forward energy markets. The day-ahead and hour-ahead energy schedules submitted by Schedule Coordinators reflect the energy that is purchased and sold through bilateral contracts transacted without California ISO involvement. The ISO functions only to manage the flow of energy from the forward markets in a manner consistent with system reliability and the operational limitations of the transmission grid. Figure 1 illustrates the relative daily energy volumes in the bilateral markets as opposed to the CAISO balancing market. The figure makes clear that only a small fraction of the total energy generated within the CAISO control area is settled through the CAISO balancing energy market. The great majority of energy is delivered via bilaterally negotiated contracts and scheduled as hour-ahead energy. In the month of February only 2.5 percent of total energy was settled in the balancing market.

**Figure 1: Scheduled Energy vs. Balancing Market Energy**



## Prices and Volumes

One aspect of interest in assessing market performance is the impact of real-time energy price variations on the overall cost of balancing energy in the CAISO real-time market.

**Figure 2: Daily Cost of Real-time Energy vs. Price**

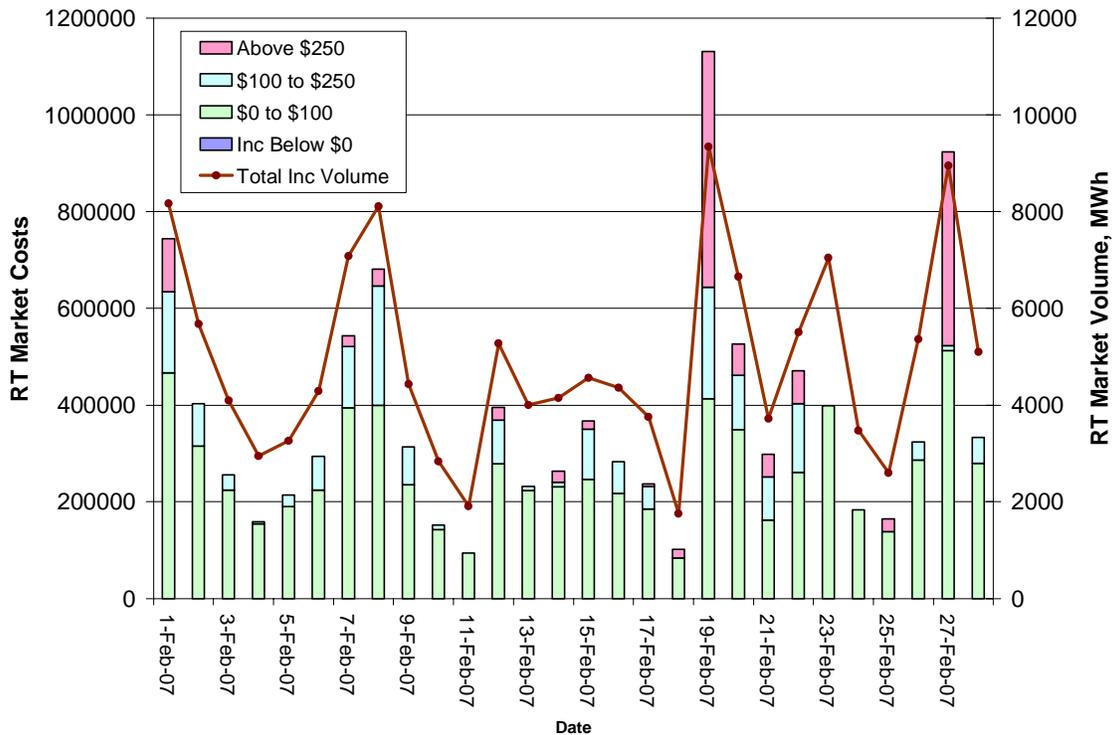


Figure 2 illustrates the relationship between real-time market prices and the total costs of incremental real-time energy<sup>1</sup>. The colored bars represent the daily total cost of purchasing incremental energy at a given price. As the figure illustrates, prices above \$250 do occur, but those instances do not represent the major portion of the real-time energy costs. The total expenditure on higher-priced energy never exceeded the amount spent on sub-\$100 energy, except on February 19. On that day there was a 230kV line trip, and in addition the CAISO skipped some ancillary service bids to preserve operating reserves, resulting in a deeper dispatch into the supplemental energy stack, and thus higher associated costs. Costs on the 27th were also higher than normal due to a series of weather events affecting the grid. High winds in the south and snow in the north resulted in higher dispatch volumes due to a number of transmission lines relaying out and related generators tripping offline. Predictably, high prices affect the market most strongly when the real-time market volume peaks. As one dispatches further into the stack not only does the volume increase, but so does the price at which that volume is transacted, due to the uniform price auction methodology whereby all dispatched generators are paid the same clearing price. Other instances of high prices tend to be brief and of low overall impact.

<sup>1</sup> This graphic was compiled by multiplying the quantity of supplemental energy purchased in each dispatch interval by the price, then summing over each price category for all intervals in the day.

In percentage terms, 69.6 percent of all incremental energy expenditures occurred at prices less than \$100 per MWh while 12.9 percent were transacted at prices greater than \$250.00. It should be borne in mind that these percentages are calculated in terms of dollar costs, not MWh volume. Taken as a percentage of the total transacted energy in MWh, volume purchased above \$250 is considerably smaller than 12.9 percent. Note again that the total volume transacted in the real-time balancing market is only 2.5% of the overall total energy consumed for the month of February.

### Ten-Minute Energy Prices

Ten-minute settlement interval prices for SP15 are plotted in Figure 3. They are presented as scatter plots to give a better visual presentation of the relative density of various prices and trends. On average, real-time dispatch prices were less volatile in February, exceeding \$250 on 50 occasions (0.6% of the time as there are 8,064 intervals in February) as compared to 102 occasions in January. Most of February's price events (26) occurred on just two days. There were 16 events on February 19th due primarily to a tripped 230kv line, and 10 events on February 27th that were driven by under-scheduled generation relative to the load forecast.

Figure 3: SP15 Real-time Settlement Prices – February 2007

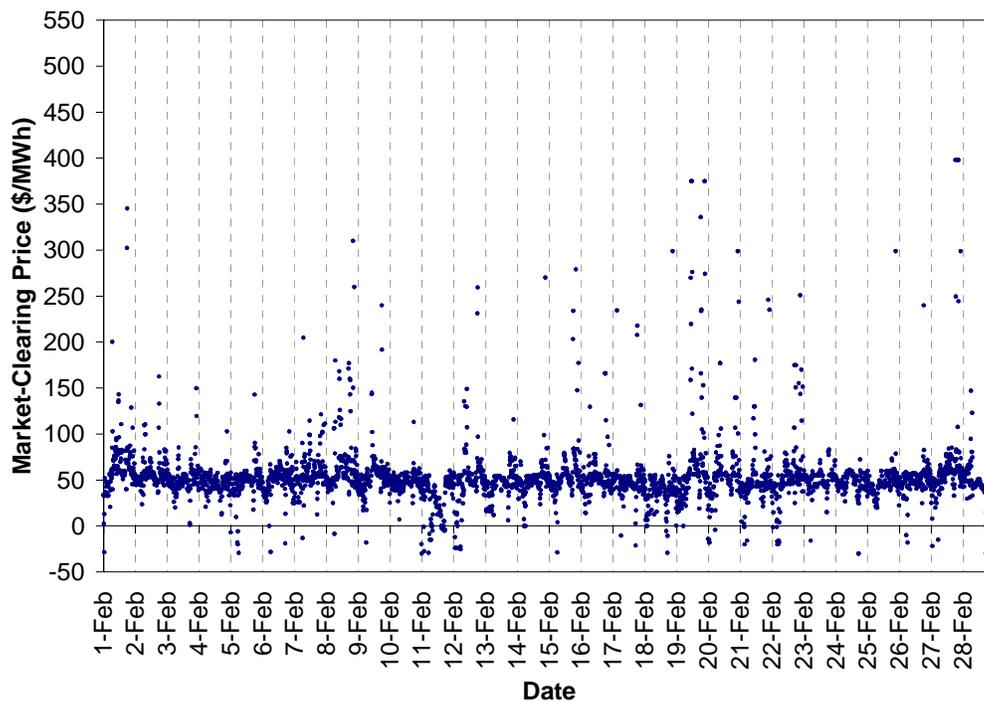
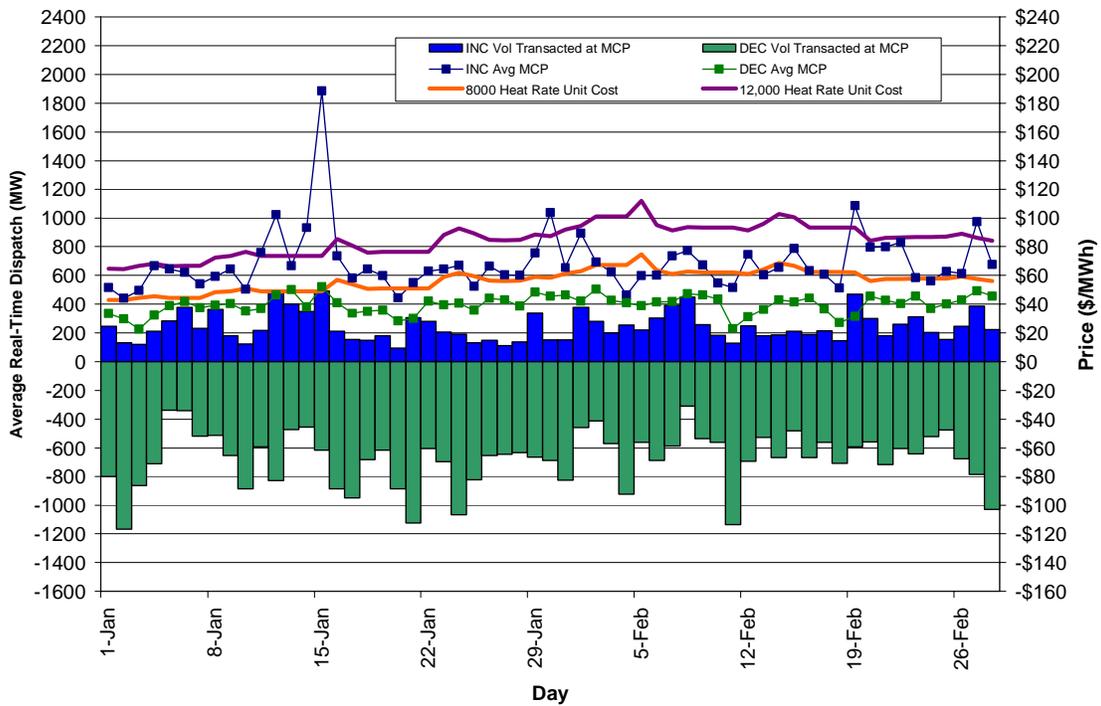


Figure 4 provides a detailed breakout of the imbalance energy prices and volumes for January and February. Here, it is clear that real-time dispatch prices were less volatile in February than in the previous month. The relative decline in intervals with high balancing energy prices helps to explain the decrease in average incremental price at the same time that benchmark fuel costs were higher in February than in January.

**Figure 4: Daily Average Real-time Prices and Volumes for In-Sequence Energy – Jan and Feb 2007**



## Ancillary Services Market Prices

As compared to January 2007, weighted average Ancillary Services prices for all Ancillary Service Markets decreased sharply in February. The main reasons for the price decreases can be attributed to fewer bid insufficient hours, better low-price bid availability, as well as better Regulation Up prices than January. Table 1 shows the price breakout for each service separately, while Figure 5 below displays the six-month price trend on a weekly average basis.

**Table 1: Average Ancillary Service Requirements and Prices - Jan and Feb 2007**

	Average Required (MW)				Weighted Average Price (\$/MW)			
	RU	RD	SP	NS	RU	RD	SP	NS
Jan 07	372	360	832	831	\$ 15.24	\$ 11.16	\$ 4.26	\$ 1.27
Feb 07	370	357	824	806	\$ 10.87	\$ 8.92	\$ 2.73	\$ 1.06
	-0.4%	-0.8%	-1.0%	-3.0%	-28.6%	-20.1%	-35.9%	-16.2%

**Figure 5: Weekly Weighted Average Ancillary Service Prices – Sep 2006 to Feb 2007**

