California ISO

California Independent
System Operator

# Market Analysis Report

## *Events of March 2004*

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# March Highlights

- March-04 Loads 4.2% higher than last year
  - Mild weather in Mar-03; unseasonably warm in Mar-04
  - Improving economy
- Real-time market stable, few incremental price spikes beyond Stage 1 Emergency
- RT DEC MCP frequently at -$0.01/MWh in late March and first half of April
  - Usually in early morning (2:00-8:00 a.m.) but not exclusively
  - Bid by spilling hydro unit to signal zero value of decrementation
- Intrazonal congestion costs remained high in March
  - Costs $8.1 million in March
  - Mostly due to Miguel/SWPL congestion
  - SONGS out for refueling Feb 9 through March 25
- Ancillary Service bid insufficiency increased significantly in March
- Strong imports from Southwest caused interzonal congestion on Palo Verde intertie

# 3/8/04 Transmission Emergency: Market Impact

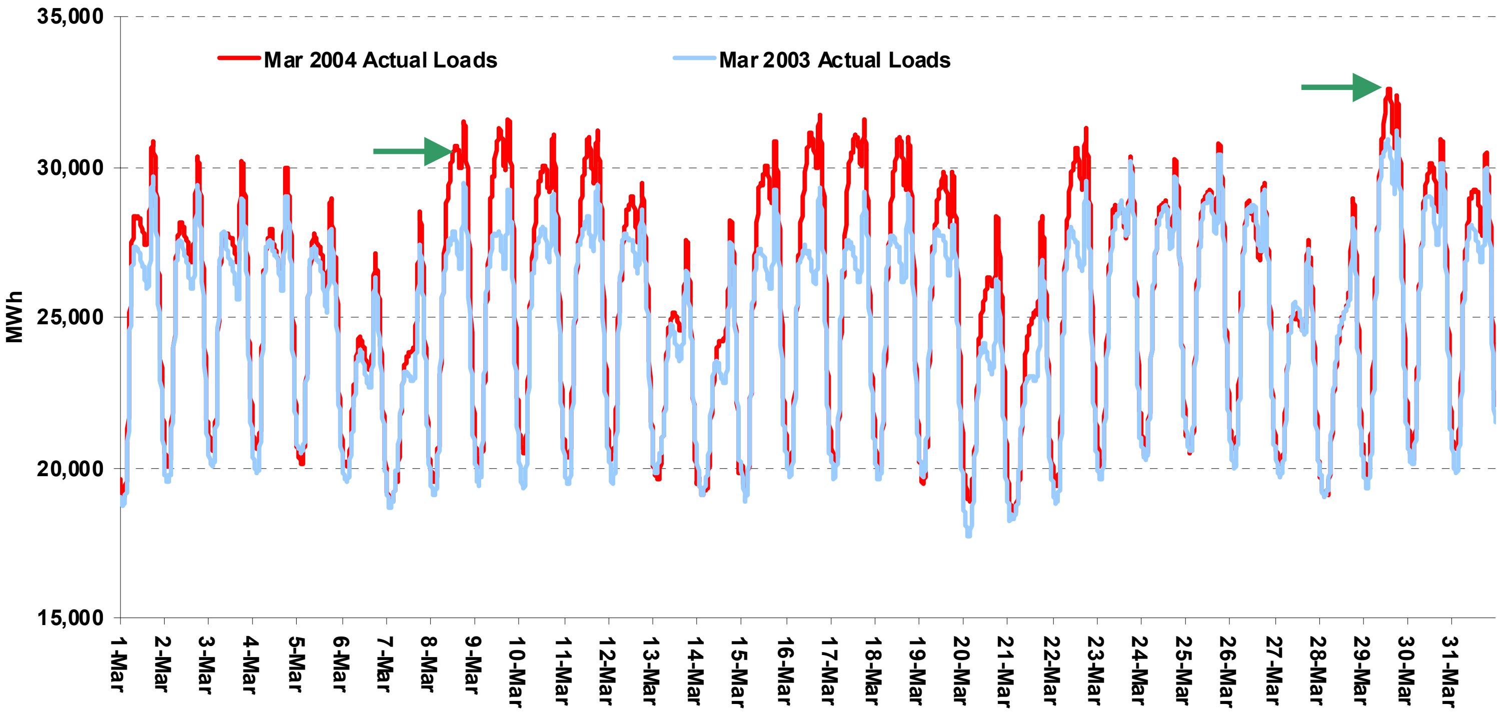
- SP15 INC Price ranged from $110.86/MWh to $144.27/MWh between 6:10 and 7:10 p.m.
- AMP not applied during emergency
- Shortage resolved through arrangement of OOM energy
- SP15 INC stack and NP15 DEC stack exhausted as transmission capacity limited flows
- Real-time cost impact not excessive: price-cost markup approx. $38,000
- Ancillary service prices not unusual, but lack of bids was a problem

# 3/29/04 Stage 1 Emergency: Market Impact

- SP15 INC Price was $110.86/MWh from 12 noon to 12:30pm, and $150/MWh from 12:30 to 4:30 pm and from 6:40 to 7:40 pm
- $150/MWh price bid by a high-cost peaking unit
  - Would not have failed the AMP Conduct Test
  - Second-highest-cost unit in ISO Control Area (incremental heat rate approx. 23,000)
- Real-time cost impact: Price-to-cost markup approx. $425,000 over 5 hours, or roughly $77,000 per hour
  - Calculated markup significant but not extraordinary, due to high cost of marginal unit
- Like March 8 emergency, A/S prices were not out of the ordinary, but lack of bids was again a problem

# Unseasonably Warm Weather Caused Loads to Increase, Particularly on March 8 and 29

## Hourly Actual Loads, Mar-04 v. Mar-03



## Consistent increase in load since Jul-03

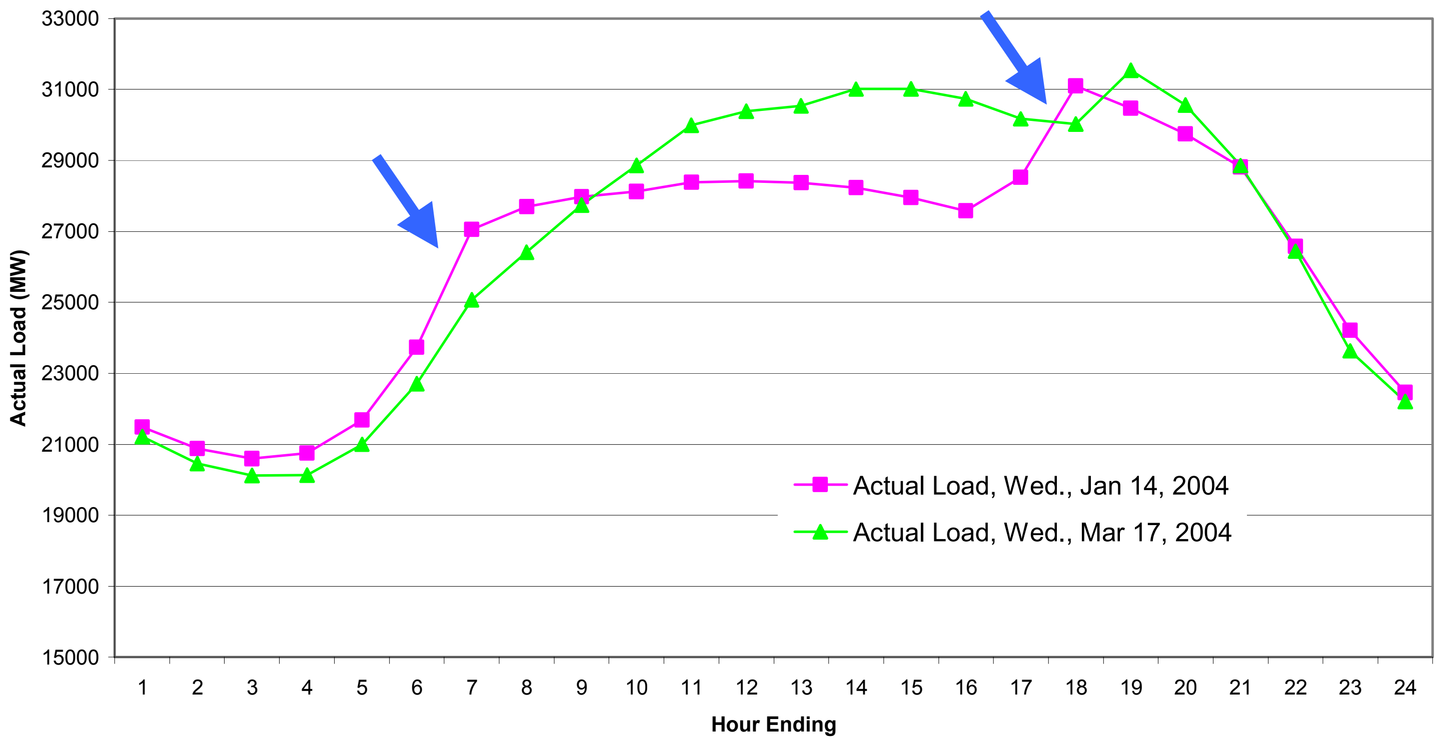
### *Load Growth Rates Compared with Same Month Prior Year*

| | Avg. Hrly. Load | Avg. Daily Peak | Monthly Peak |
|---|---|---|---|
| **April-03** | -2.7% | -2.2% | 0.2% |
| **May-03** | -0.8% | 0.7% | 10.5% |
| **June-03** | -1.6% | -1.1% | 3.6% |
| **July-03** | 4.3% | 6.9% | 0.5% |
| **August-03** | 5.4% | 8.5% | 4.3% |
| **September-03** | 2.2% | 3.3% | 0.3% |
| **October-03** | 5.4% | 7.0% | 3.7% |
| **November-03** | -0.2% | 1.0% | 0.2% |
| **December-03** | 2.8% | 3.1% | 2.7% |
| **January-04** | 4.3% | 3.1% | 3.2% |
| **February-04** | 4.5% | 3.9% | 4.5% |
| **March-04** | 4.2% | 4.0% | 4.5% |

Note: Load figures are based on unadjusted ISO control area loads.

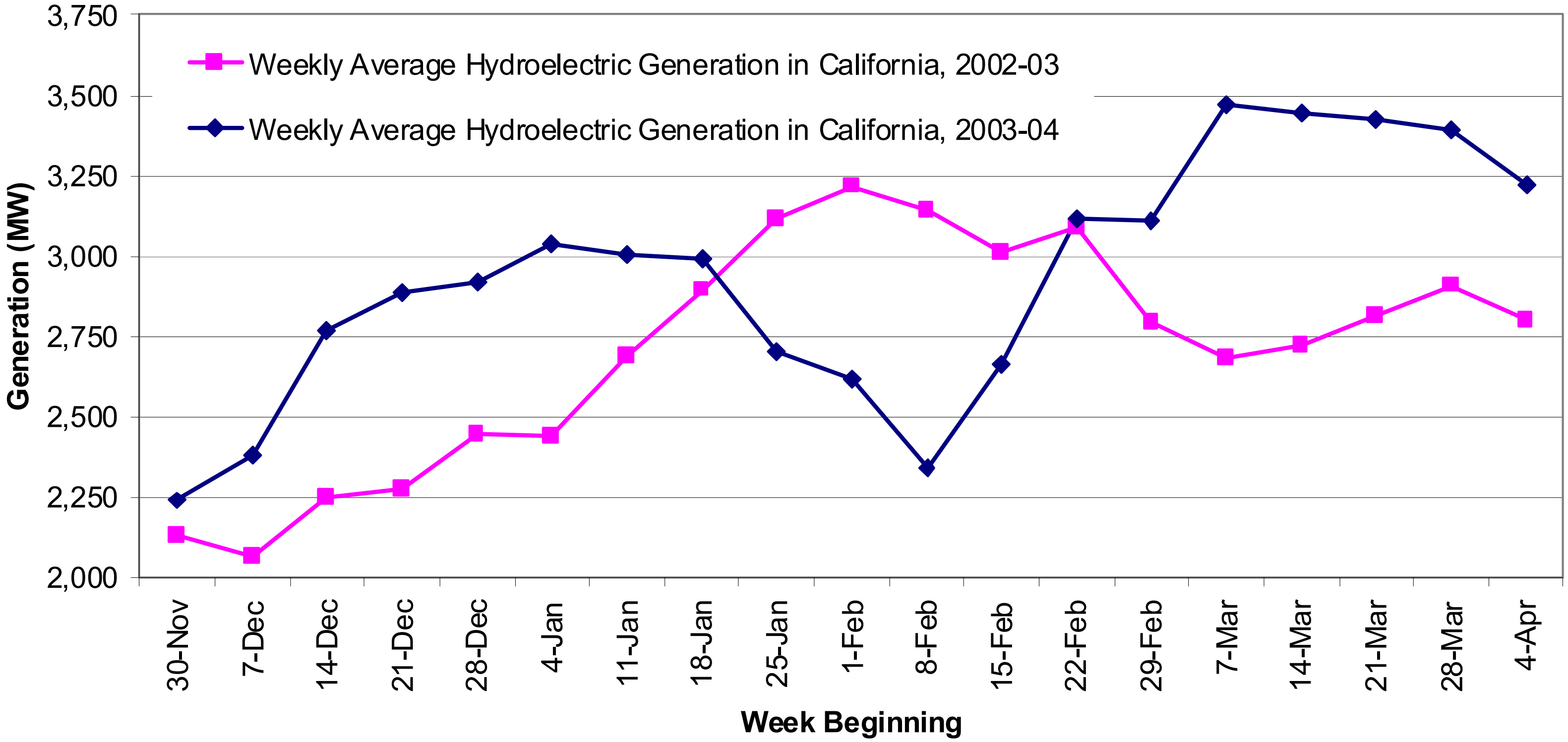
# Smoother seasonal load pattern facilitates ramp planning; decreases likelihood of price spikes during steep ramp hours

## Actual Loads on two Wednesdays (1/14/04 and 3/17/04)



## Spring Runoff early in 2003, due to warm weather in March

### Approx. Weekly Average Winter/Spring Hydro Production through early April: 2003-04 v. 2002-03



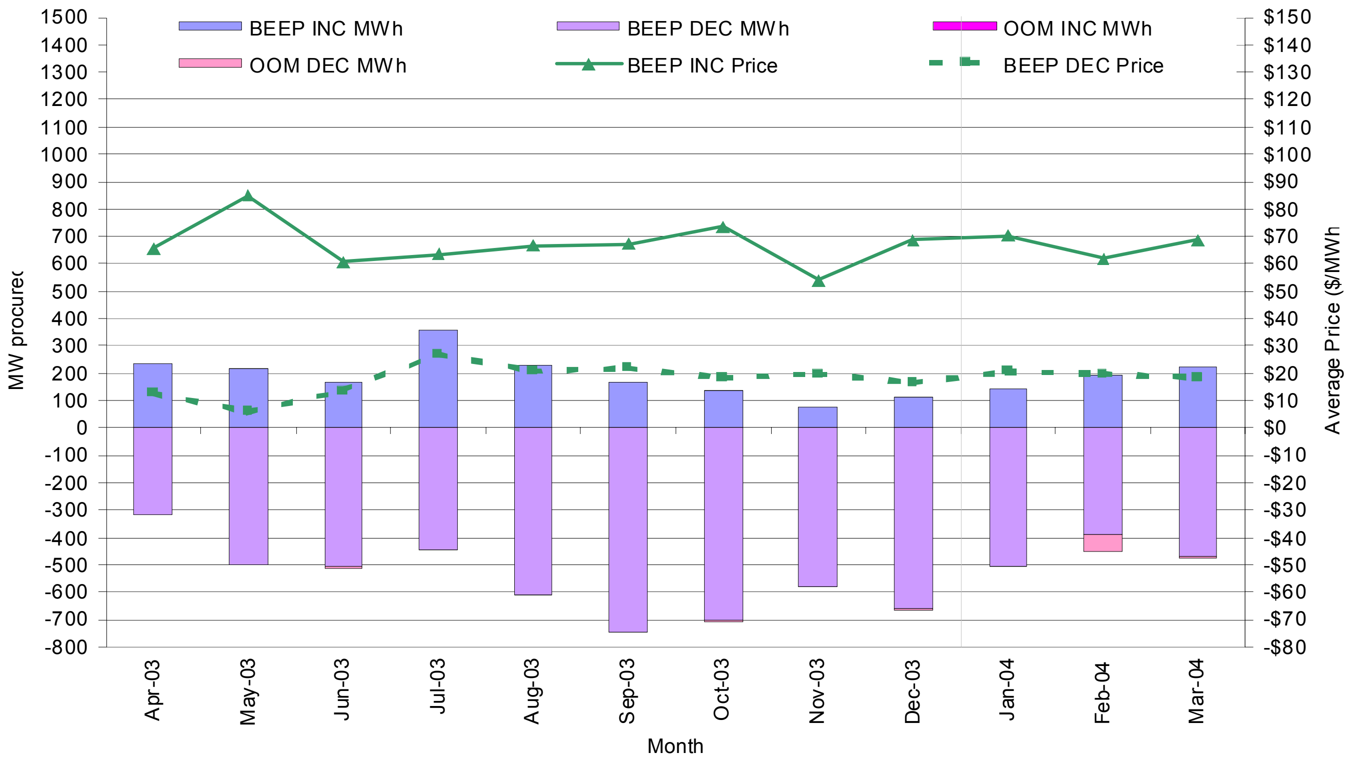
# Incremental and Decremental Prices respectively averaged $68.62 and $18.59/MWh in March

## Monthly Average Real-Time Incremental and Decremental Prices, Total Dispatched Energy, and Loads and Underscheduling, in March 2004

| | Overall Avg. Real-Time Price and Total Volume | | Avg. System Loads (MW) and Pct. Underscheduling |
|---|---|---|---|
| | Inc | Dec | |
| Peak | $ 73.72<br>130 GWh | $ 19.39<br>289 GWh | 27,552 MW<br>1.0% |
| Off-Peak | $ 51.15<br>38 GWh | $ 15.06<br>66 GWh | 21,116 MW<br>1.7% |
| All Hours | $ 68.62<br>168 GWh | $ 18.59<br>355 GWh | 25,407 MW<br>1.2% |

# INC-DEC ratio more balanced;
# -$0.01 DECs had slight lowering effect on DEC price trend

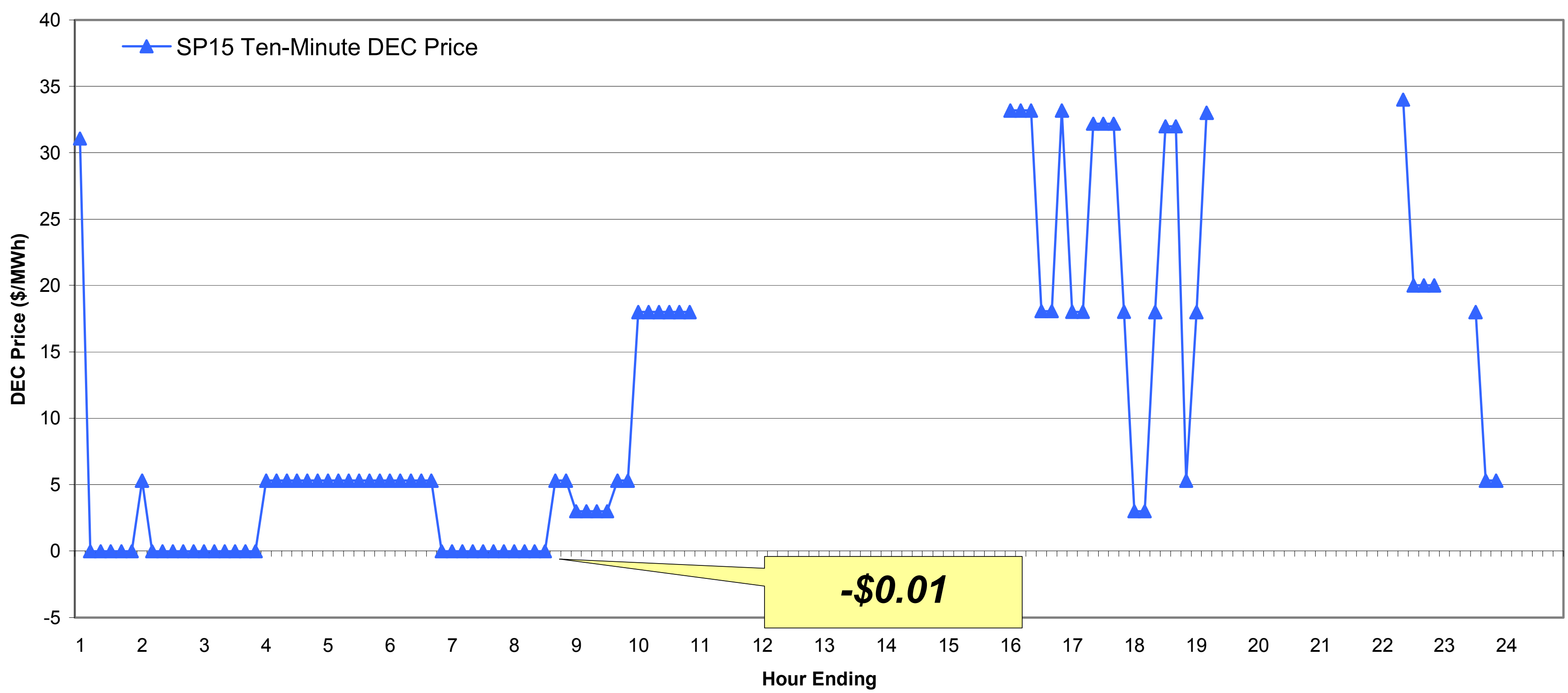
## Monthly Average Real-Time Incremental and Decremental Prices and Volumes through March 2004




Note: Feb-04 OOM calls were used to manage intrazonal congestion at Miguel.

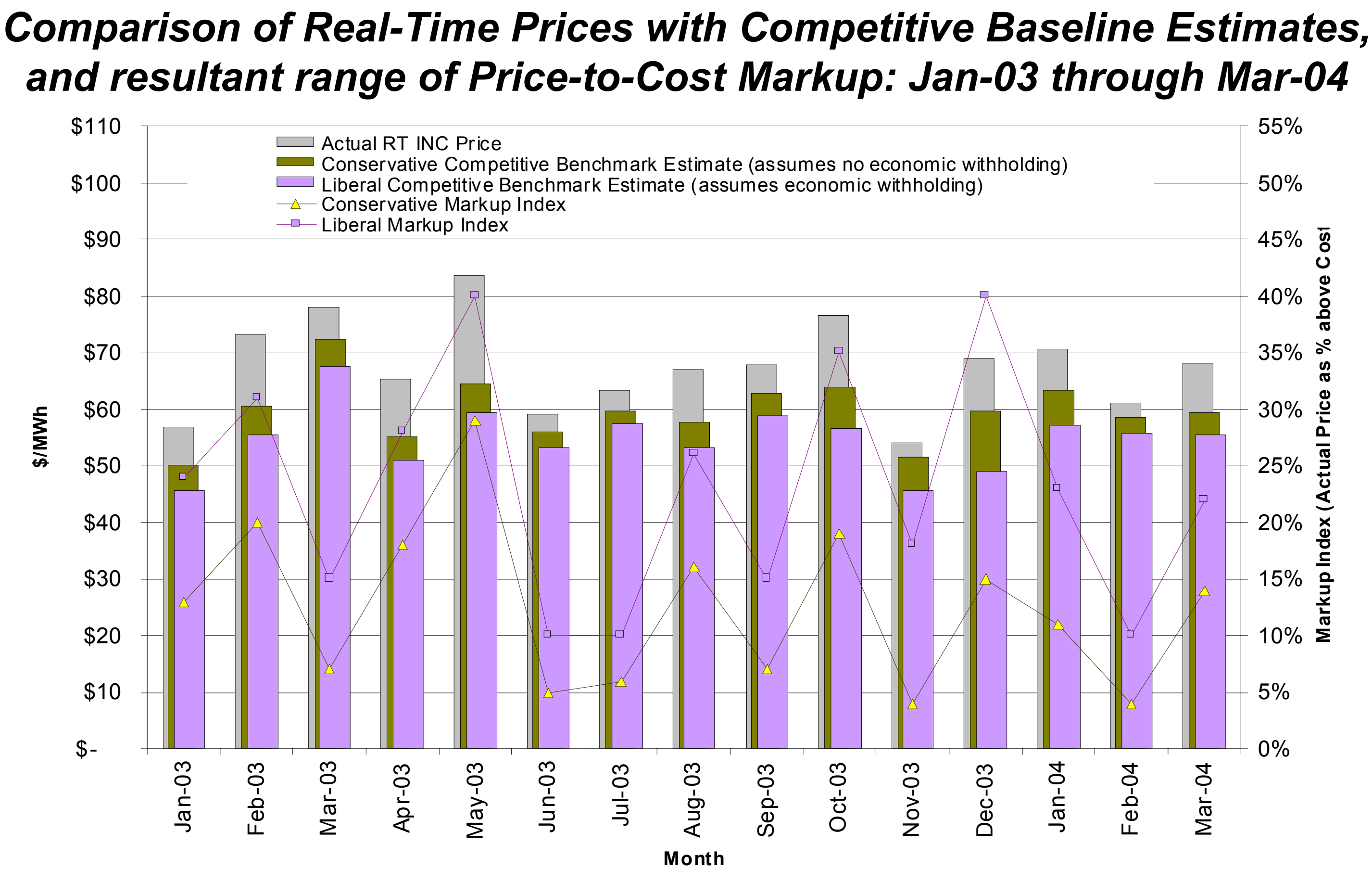
# Decremental Price has frequently been -$0.01/MWh in morning hours; bid by a spilling hydro unit that has no benefit in being decremented

## Real-time Decremental Ten-Minute Interval Prices in SP15, March 21, 2004



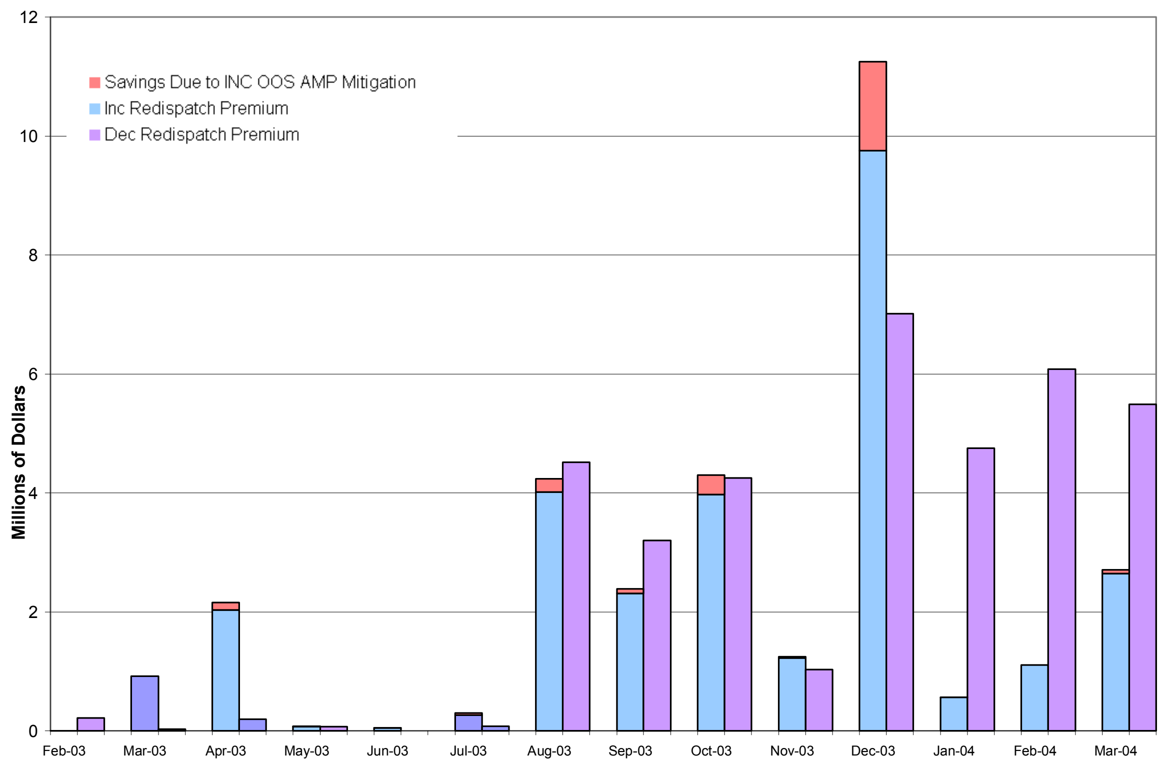

Note: Only intervals in which DEC bids were awarded in SP15 are shown.

# Real-time price-to-cost markups between 14 and 22 percent in March; March 29 Stage 1 Emergency accounted for roughly 15 percent of monthly markup



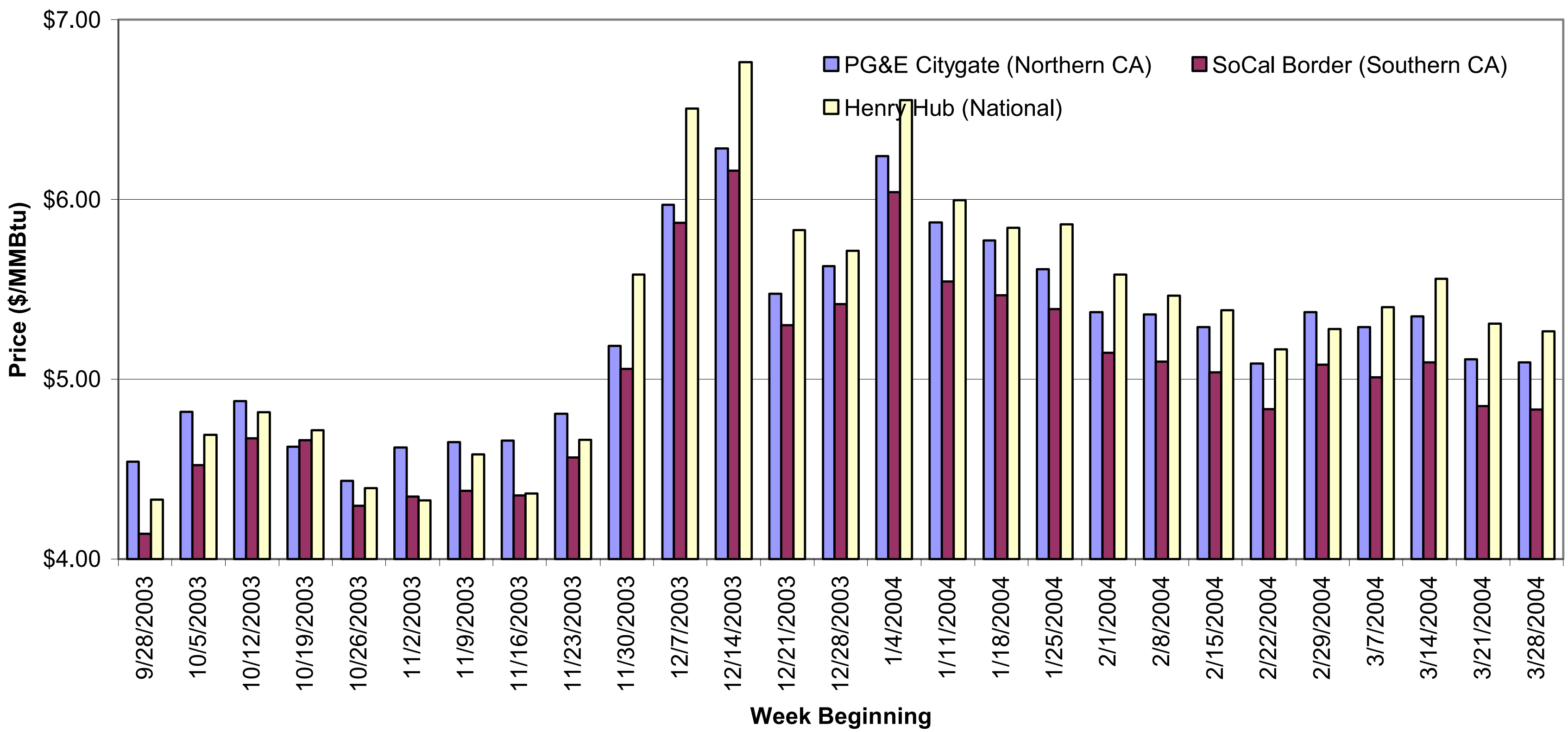
**SONGS Unit 2 outage required additional imports from Southwest, exacerbating Miguel/SWPL congestion; but this was offset somewhat by Palo Verde outages. March Total was approx. $8.1 million**

## *Intrazonal Congestion Costs (Redispatch Premium) through March 2004*



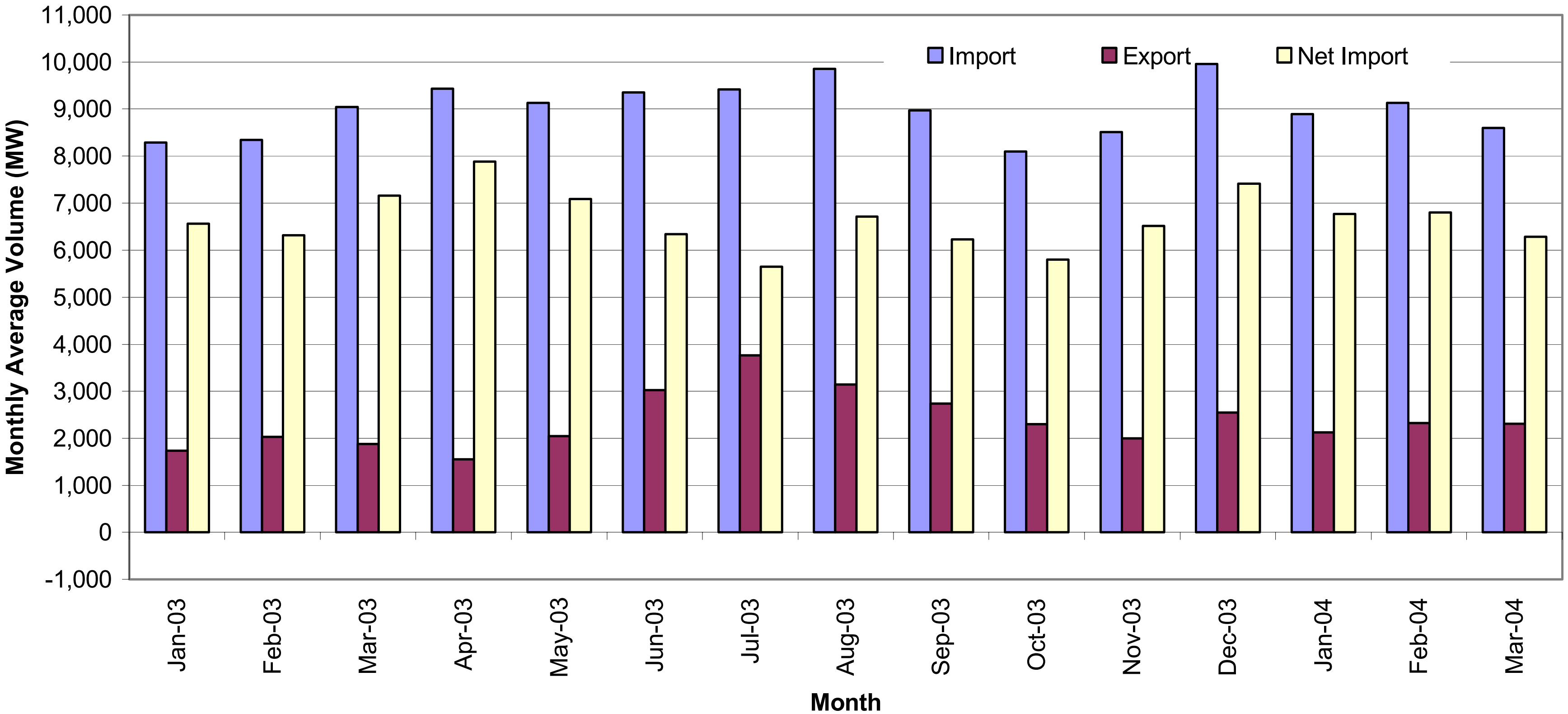
## Gas prices dropping from Dec-Jan peak levels, around $5/MMBtu

### Weekly Average Gas Prices through Mar-04



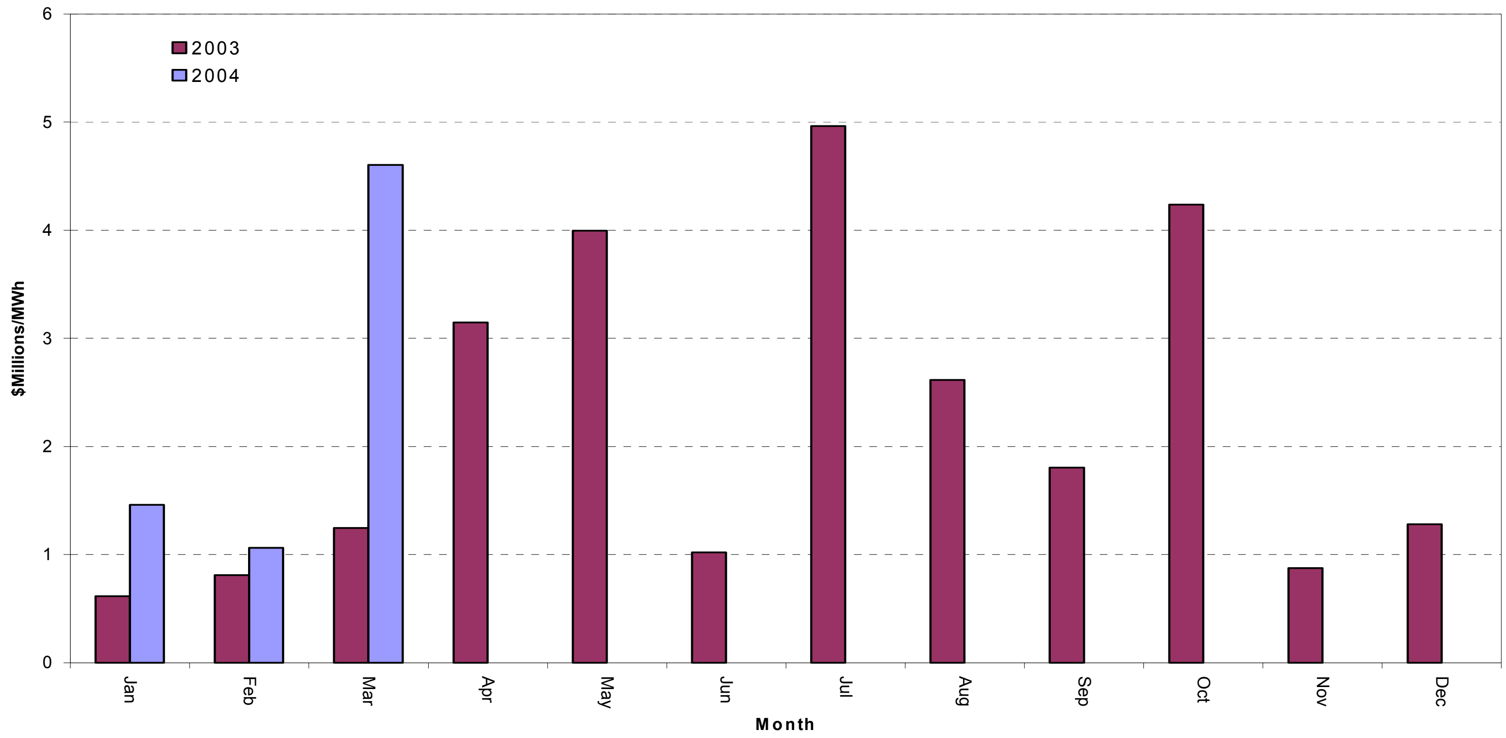
# Decrease in imports, due in part to plentiful hydroelectric supply currently available within ISO Control Area

## Scheduled Imports and Exports during Peak Hours - Monthly Averages



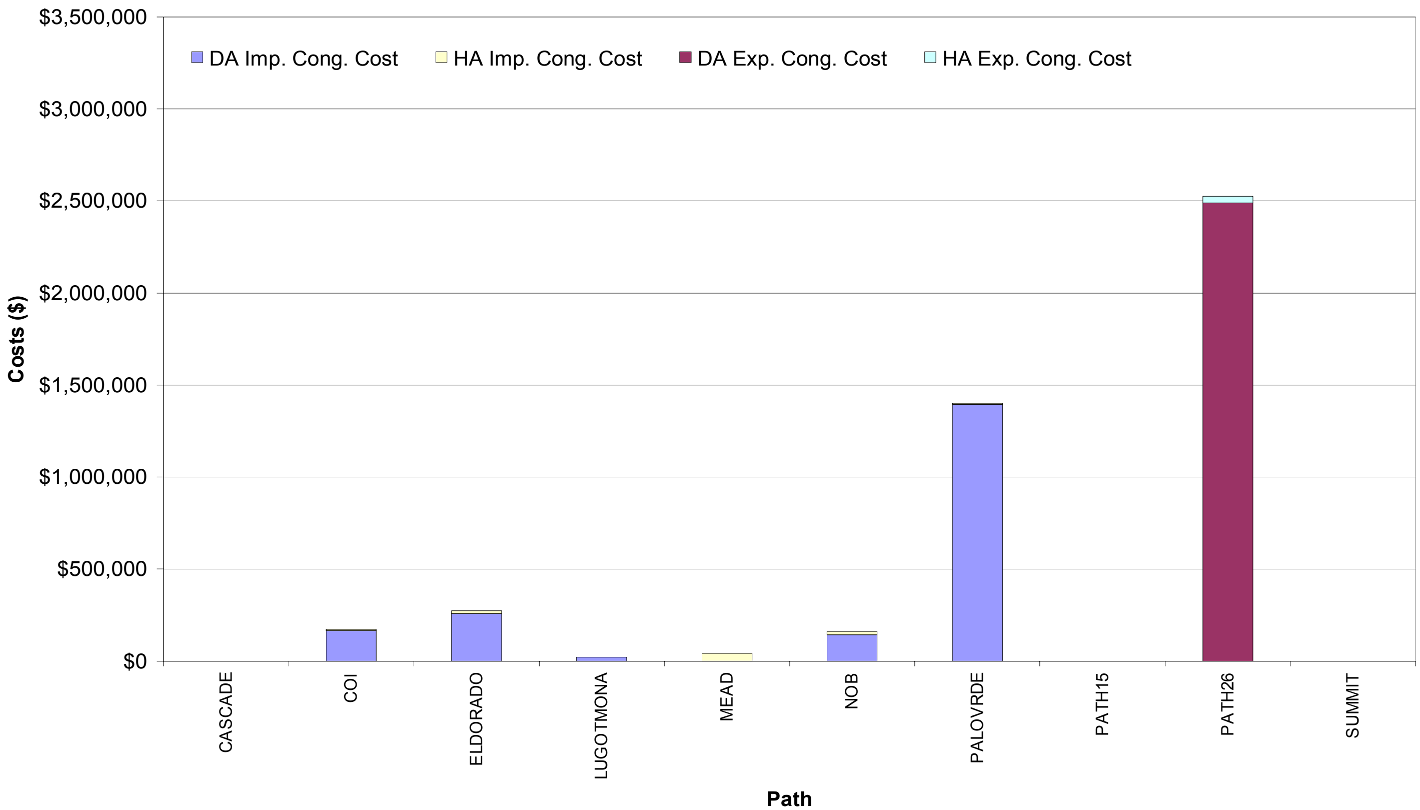
# Interzonal congestion costs increased to $4.6 million in March

## Monthly Interzonal Congestion Costs: 2004 vs 2003



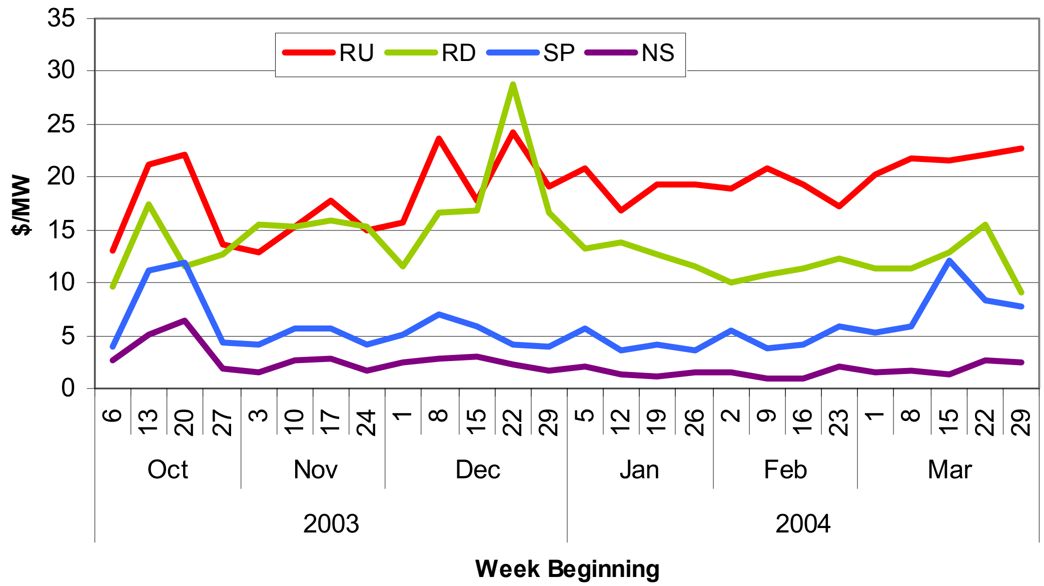
# Congested Paths: Mostly into SP15.
# Path 26 (March 1, 9, 21-31; $2.5 million; due to derates) and Palo Verde (March 13, other days; $1.6 million)

## Congestion Costs by Path and Direction in March 2004



# Ancillary Services

- Prices increased 22.8% on average for all services between Feb and March
- Overall demand decreased by 1.5% from February to March 2004
- Frequency of bid insufficiency increased by 422% from February to March 2004




| | Average Required (MW) | | | | Weighted Average Price ($/MW) | | | |
|---|---|---|---|---|---|---|---|---|
| | RU | RD | SP | NS | RU | RD | SP | NS |
| Feb 04 | 391 | 406 | 731 | 710 | $ 19.09 | $ 11.13 | $ 4.82 | $ 1.39 |
| Mar 04 | 366 | 409 | 722 | 705 | $ 21.53 | $ 12.44 | $ 7.81 | $ 1.87 |

# Frequency of Ancillary Service Bid Insufficiency Increased Significantly in March

## Frequency of A/S Bid Insufficiency, 2004 Q1