



California ISO

California Independent
System Operator

Market Analysis Report

Events of May 2004

Board of Governors Meeting
June 24, 2004

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Market Highlights

- Due to warm weather, snowpack now less than 50% of average
 - Hydro production decreased in April-May, recovered somewhat in June
 - CEC reports that water stored since 2003 should meet 85% of average summer hydro energy production
- Intrazonal congestion declined in May, yet continues to be problematic
 - Due to work on upgrade of SWPL, less power flowing through Miguel substation, decreasing congestion
 - Congestion at Sylmar, South-of-Lugo and due to SCIT persist
- Increase in scheduled imports from the Southwest
- Resurgence in interzonal congestion in May
 - Primarily due to Southwest generation serving So. CA load, derates



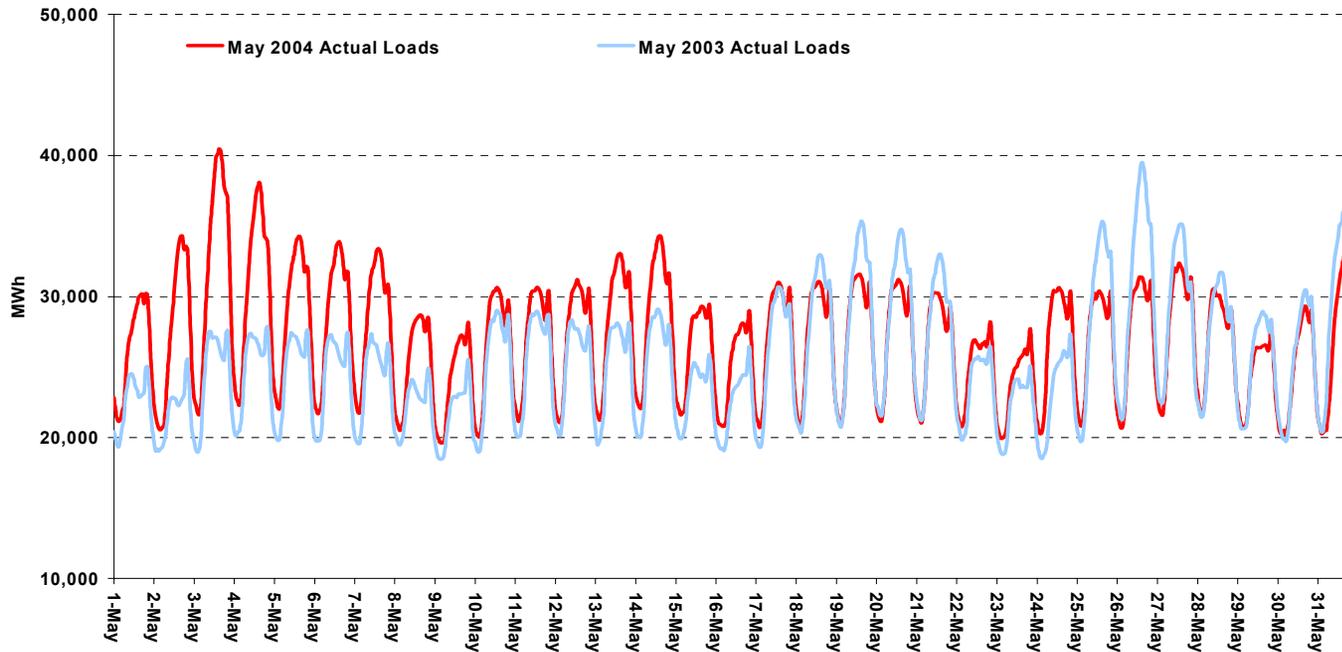
Market Highlights

- May 3rd transmission emergency
 - Temperatures in the 100s, load reached 40,484 MW (typical midsummer peak)
 - \$185/MWh price spike in SP15 for 3 hours; Approx. \$260,000 markup above competitive baseline price
- Significant new generation, but located outside of Southern California load center
 - During certain high load periods, not enough transmission to serve rapidly growing load areas in Los Angeles/Inland Empire
 - Availability of transmission currently not a significant factor in generation investment/siting decisions



Systematic (non-weather-related) growth still apparent, as indicated by comparatively high loads in 2004 during off-peak hours

Comparison of Loads: May-04 to May-03

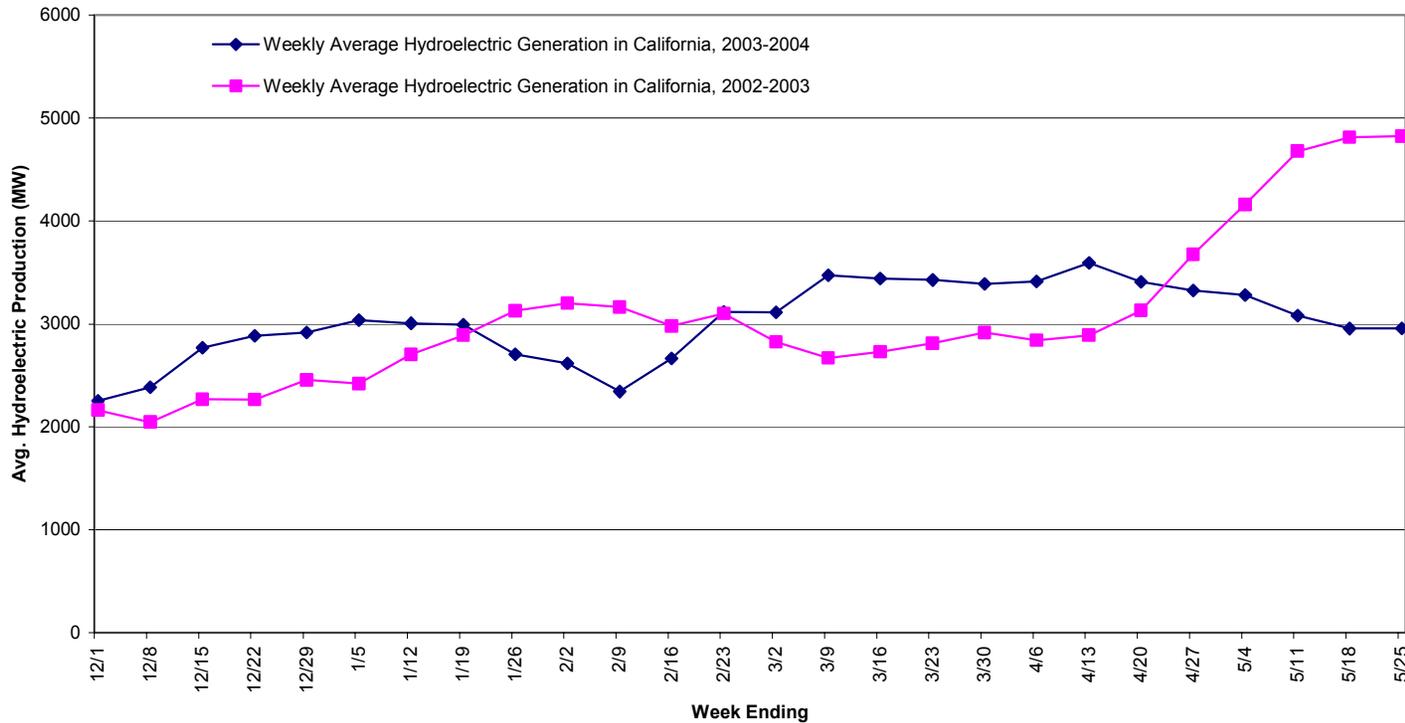


	2003	2004	Pct. Chg.
Peak Load (MW)	39,502	40,476	2.5%
Avg. Energy (MW)	25,191	27,018	7.3%



California snowpack below 50% of average by May, but CEC report expects hydro energy production to be 85% of average.

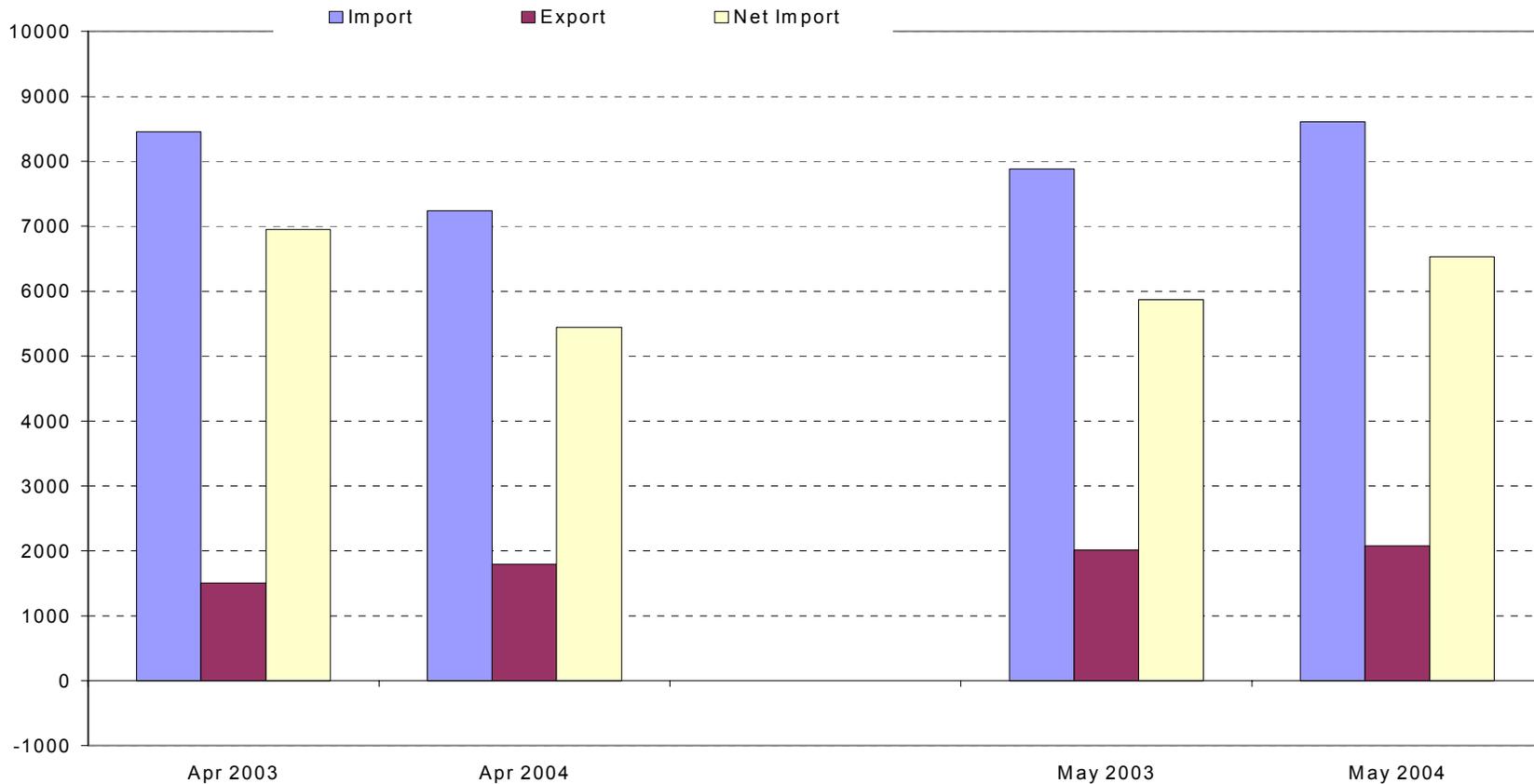
Approximate Weekly Hydroelectric Production in ISO Control Area: 2003-04 and 2002-03 Hydro Seasons





Growth in imports compared to previous month and previous year reflects higher supply from Southwest into Southern California; offset by lower imports from Pacific Northwest

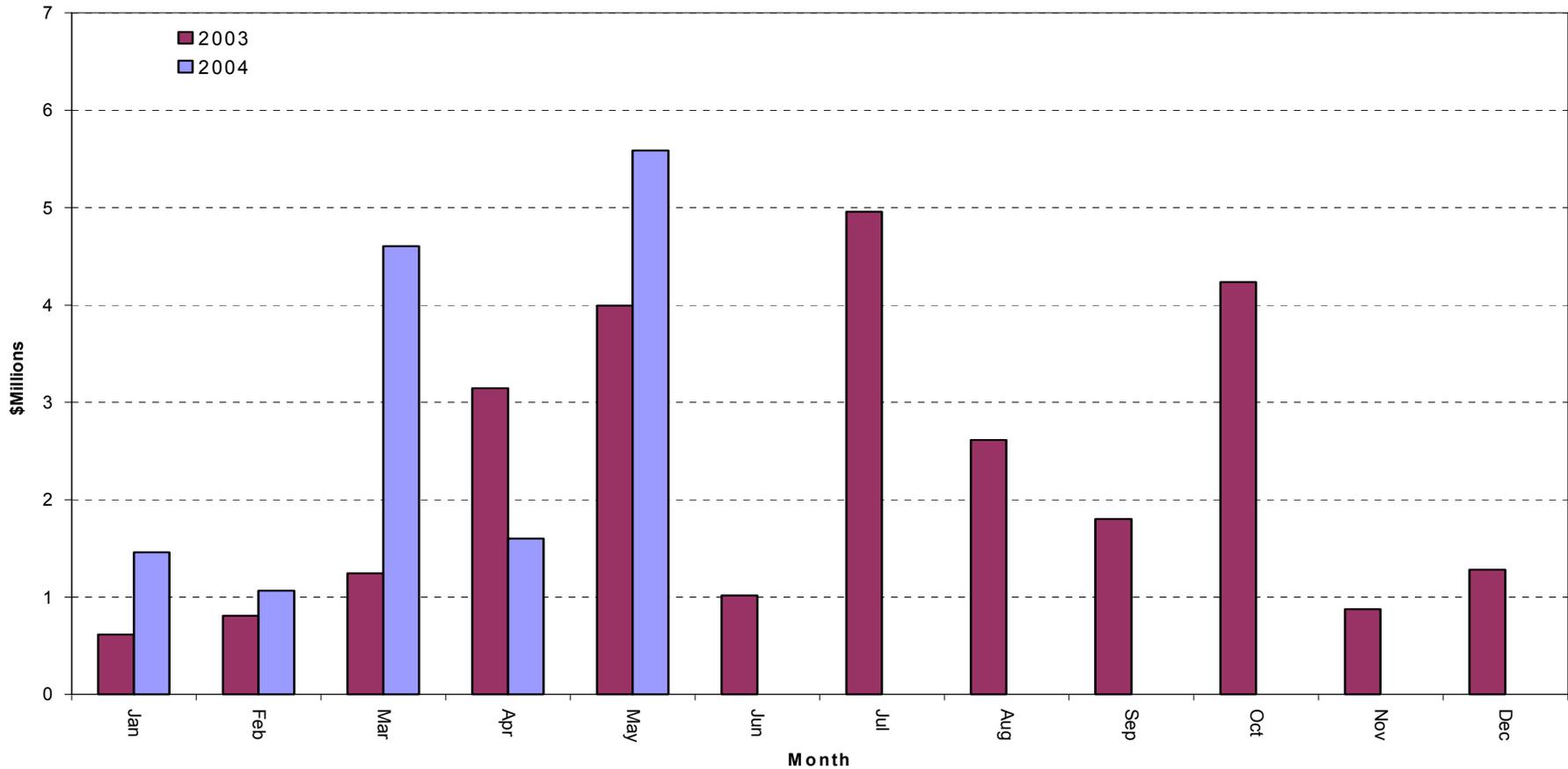
Imports and Exports – 2003 vs. 2004





Substantial increase in interzonal congestion costs due to import congestion caused by high Southern California loads and derates

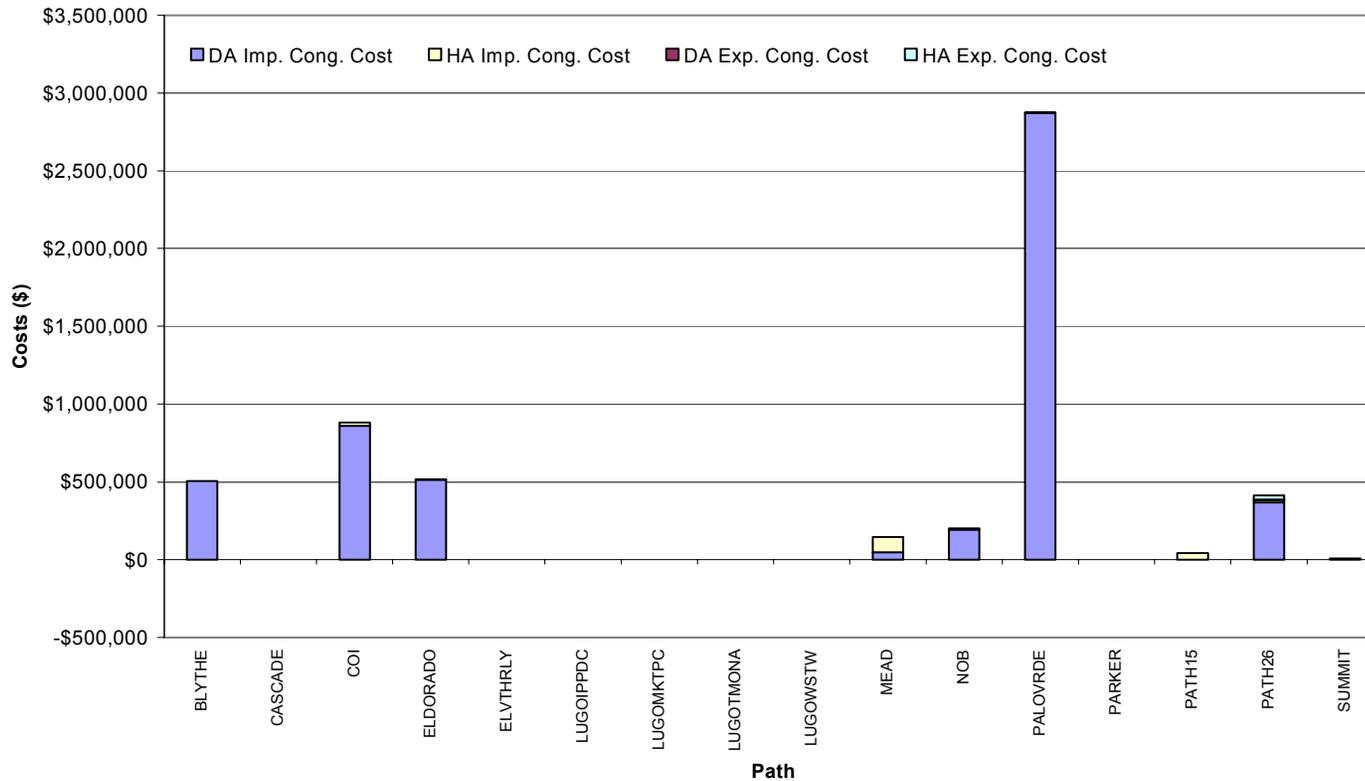
Monthly Congestion Costs: 2004 vs 2003





**Import congestion on Palo Verde, other ties between CA and Southwest.
Also, COI was congested due in part to derate and PDCI outage.
Unusual Path 26 congestion into NP15 on May 28-29 due to forced outage
of a 230kv line.**

Congestion Costs by Path: Day Ahead & Hour Ahead Markets May 2004



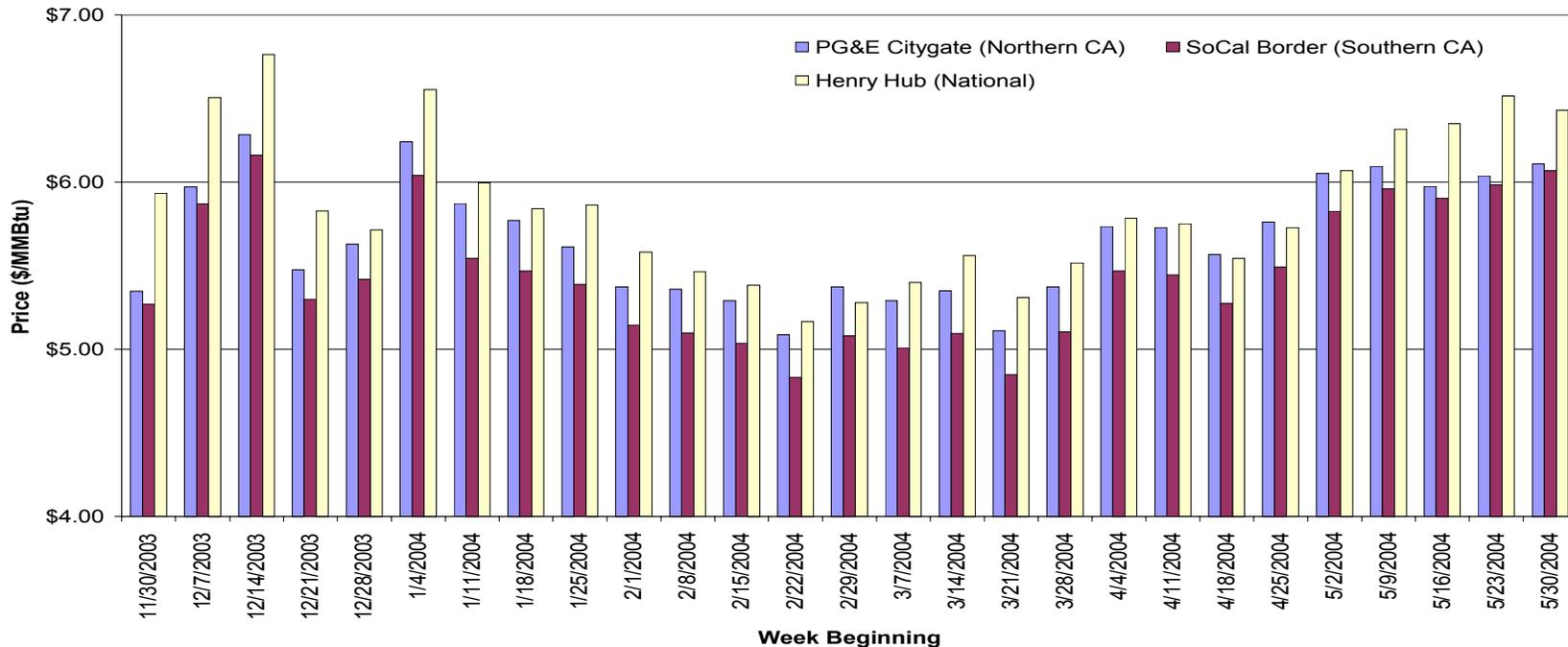


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Natural gas prices increased through May to above \$6/MMBtu

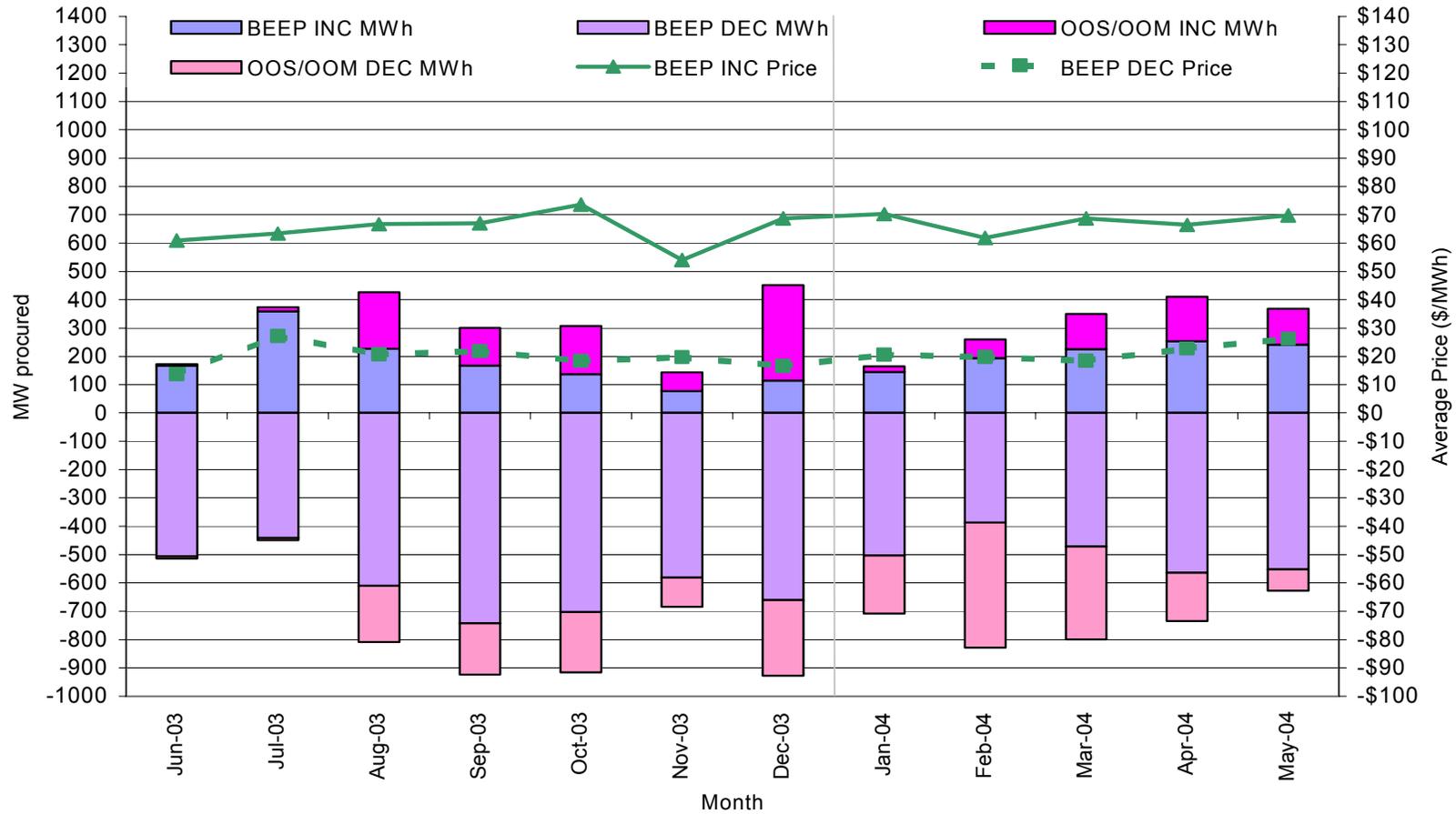
Weekly Average California and National Natural Gas Prices, December 2003 – May 2004





Real-time market relatively stable; significant volume procured either out of sequence or out of market

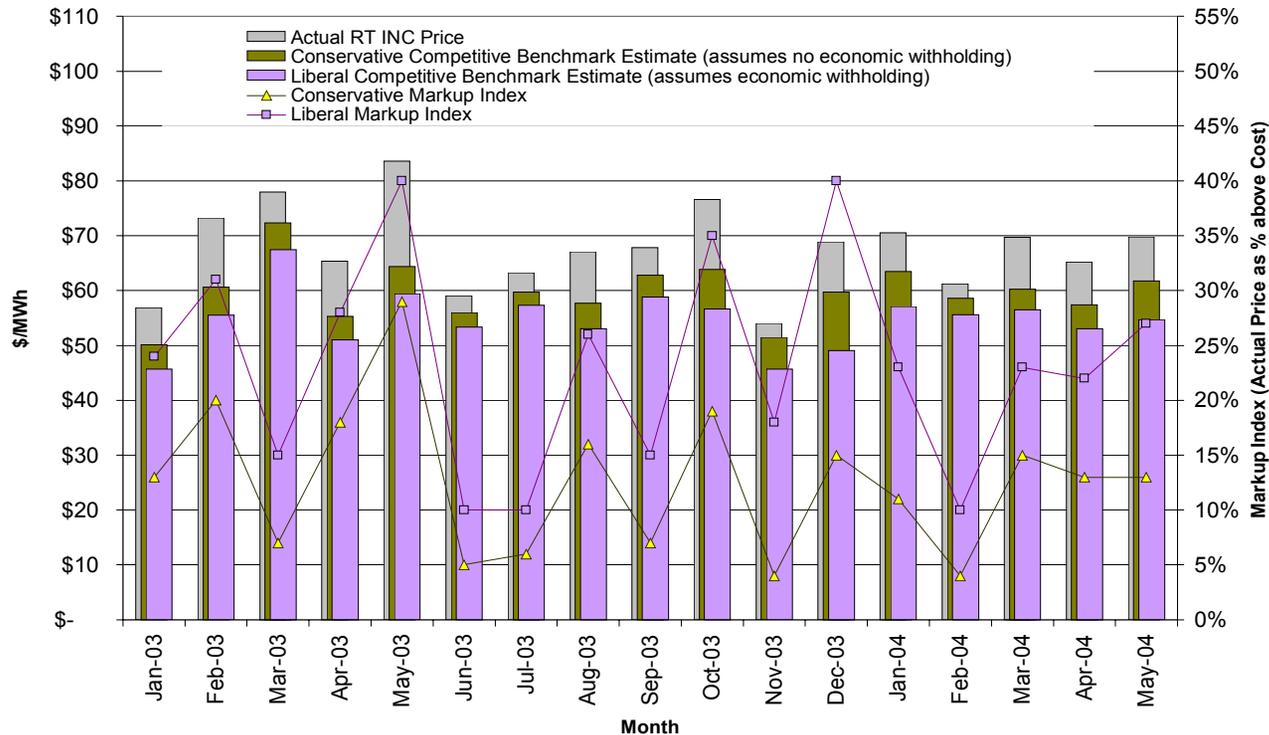
Monthly Average RT BEEP and OOS/OOM Volume through May





Average real-time prices 13-27% above competitive benchmark prices; May 3 spike accounted for 3 to 5% of monthly total markup

Monthly Average Price v. Competitive Benchmark Estimates, and Ranges of Price-to-Cost Markup, in Real-Time Energy¹

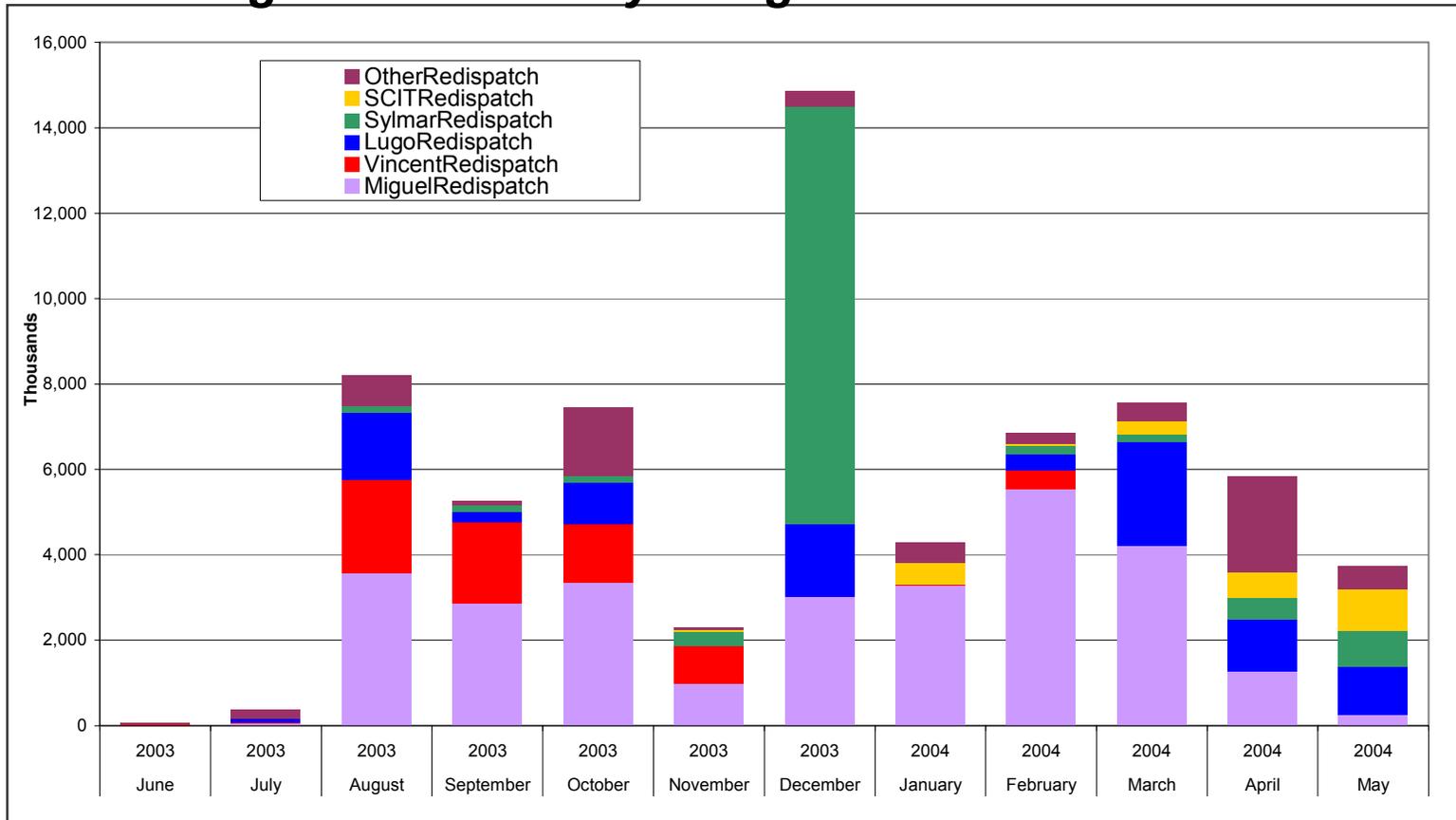


1. Ranges based upon Conservative (assumes no economic withholding) and Liberal (includes potential impact of economic withholding) markup indices.



Real-time intrazonal congestion costs at Miguel have declined significantly during work on the SWPL line upgrade. Congestion remains a problem South of Lugo and at Sylmar, and also due to SCIT

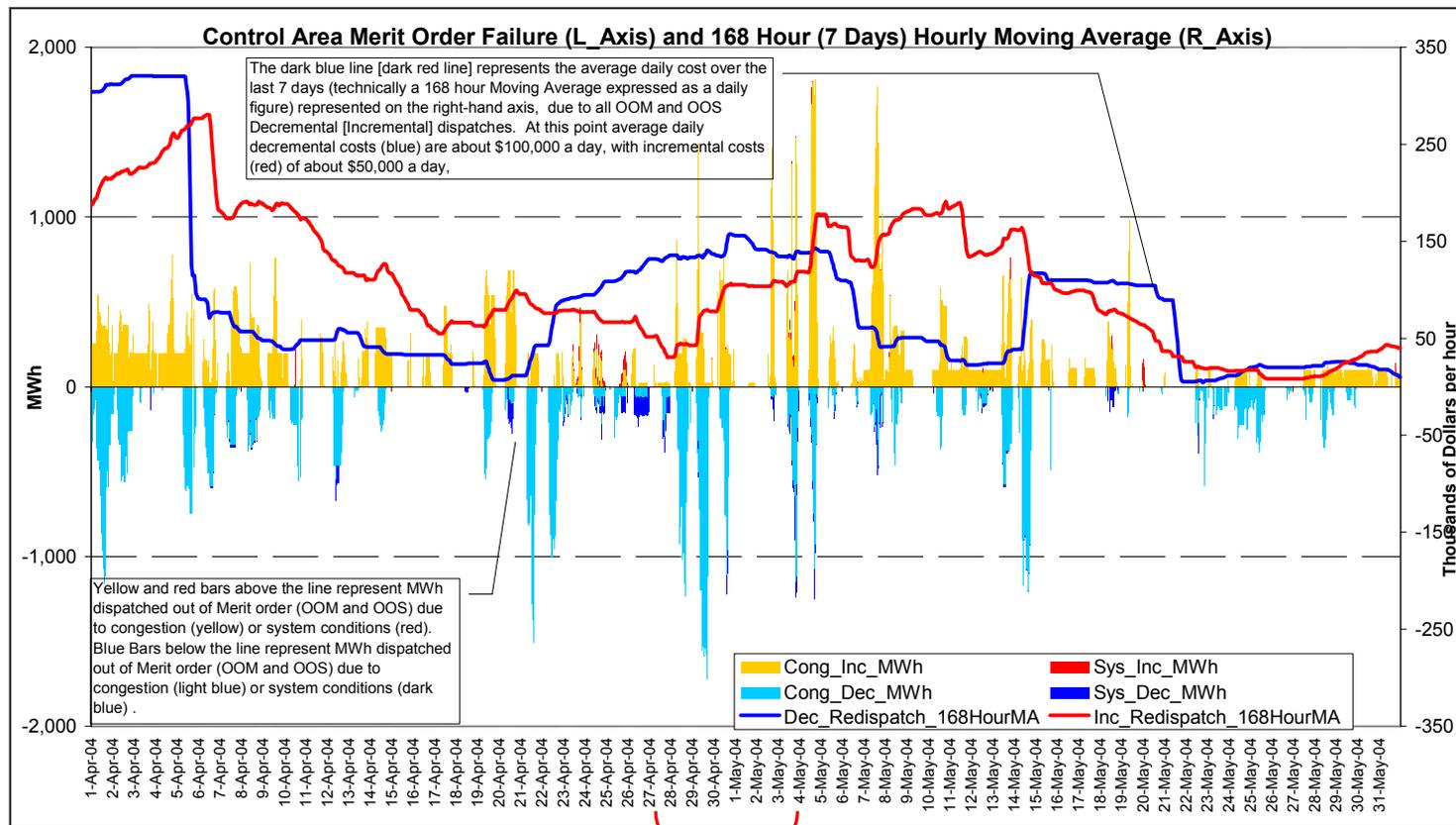
Intrazonal Congestion Costs by Congestion Point/Reason thru May





Intrazonal congestion costs often are incurred as a result of major grid events; e.g. heat wave between 4/27 and 5/3

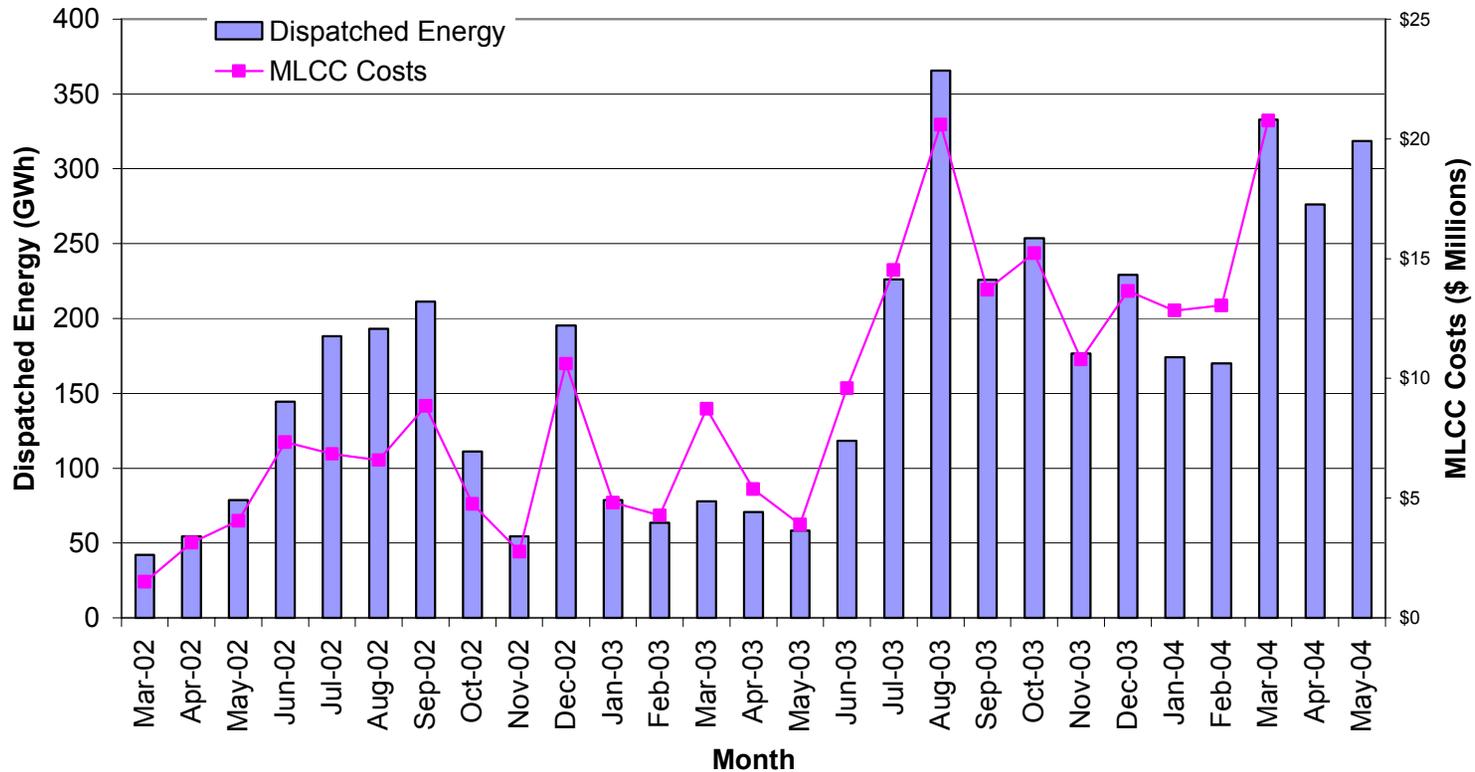
OOS Dispatch Volumes and Moving Average Costs, Apr-May 2004





Units generating at minimum load under the Must-Offer Obligation held on primarily to manage SP15 intrazonal congestion

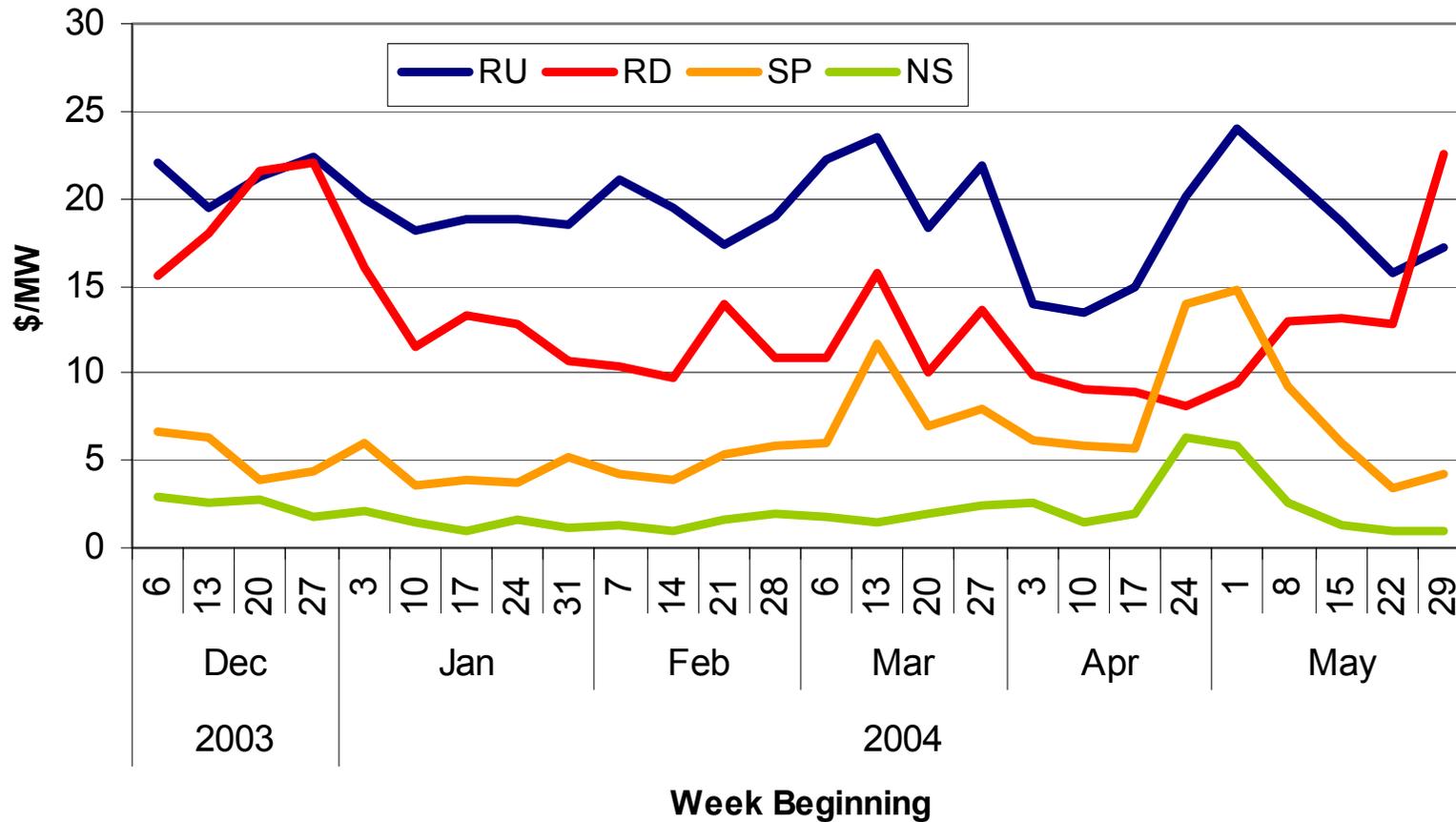
Explicit Minimum-Load Cost Compensation and Dispatched Energy





A/S prices increased, due primarily to higher prices in regulation markets

Weekly Weighted Average A/S Prices through May





Peak-hour supply increased in early May as higher energy prices attracted generation that was also able to provide A/S as a by-product, and caused a 19 percent decrease in the frequency of bid insufficiency.

Hours of Bid Insufficiency by Day in April and May

