

ISO New England State of the Market Report 2005

NEPOOL Summer Meeting
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State of the Markets 2005

- 2005 Overview

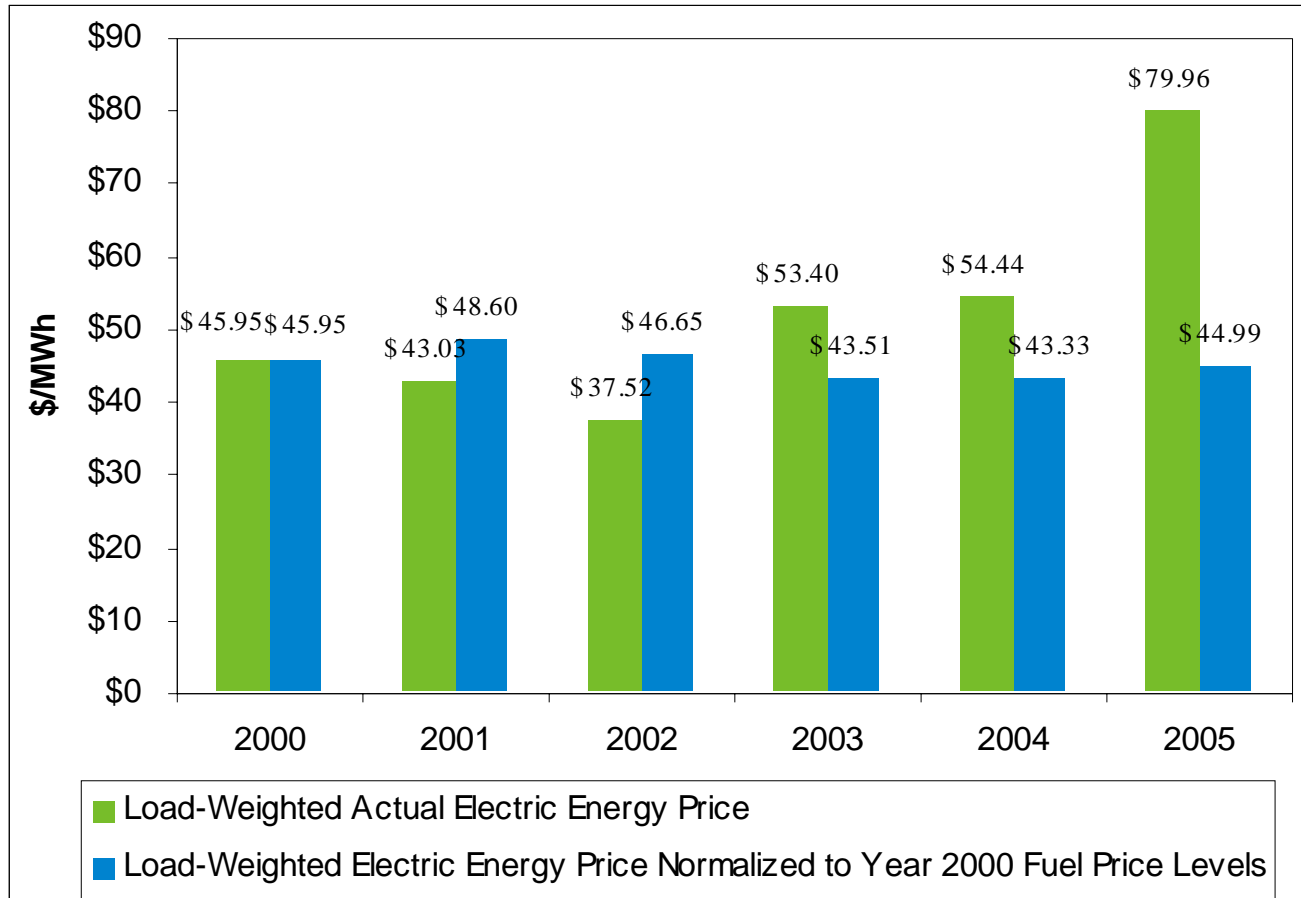
- ISO-NE completed second full year of operation under Standard Market Design (SMD)
- Wholesale electricity prices were consistent with those expected in a competitive market
- Market supported reliable system operations

- 2005 Challenges

- High fuel cost throughout the year, particularly in January, August and September
- High demand from June to September and record July peak
- Stressed energy infrastructure
- Increasing reliability costs
 - Offer behavior of generation needed for reliability in NEMA caused excess reliability commitments in 05
 - ISO initiated and FERC approved MR1 change to address issue

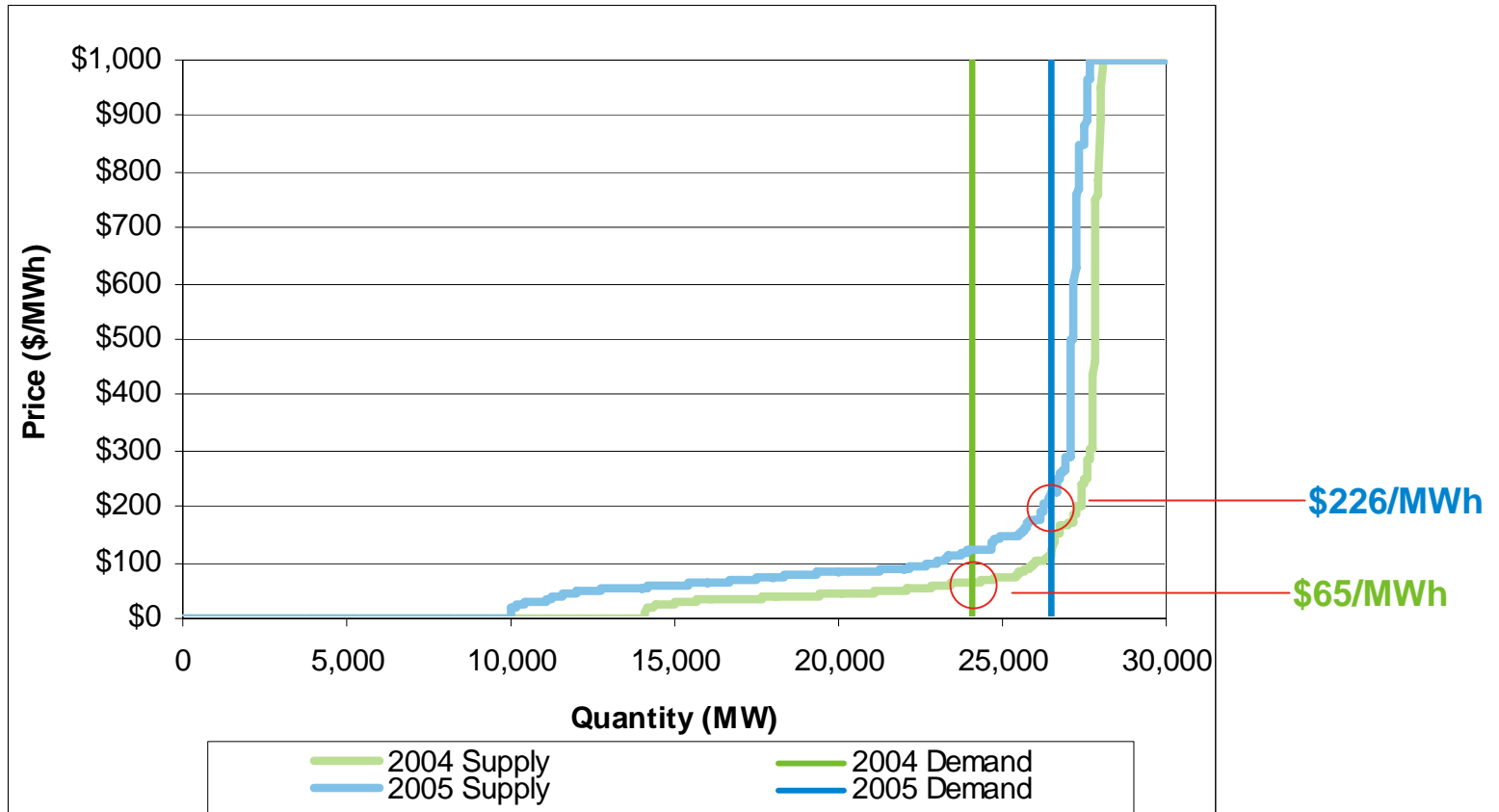
Electricity Prices Rose, Fuel-Adjusted Prices Remain Stable

Average Real-Time Electric Energy Prices, 2000 – 2005



Peak Demand/Supply Equilibrium Illustrates Price Impact of Fuel Prices and Load Growth

Supply Offer Curves & Demand: 2004 & 2005 Peak Day

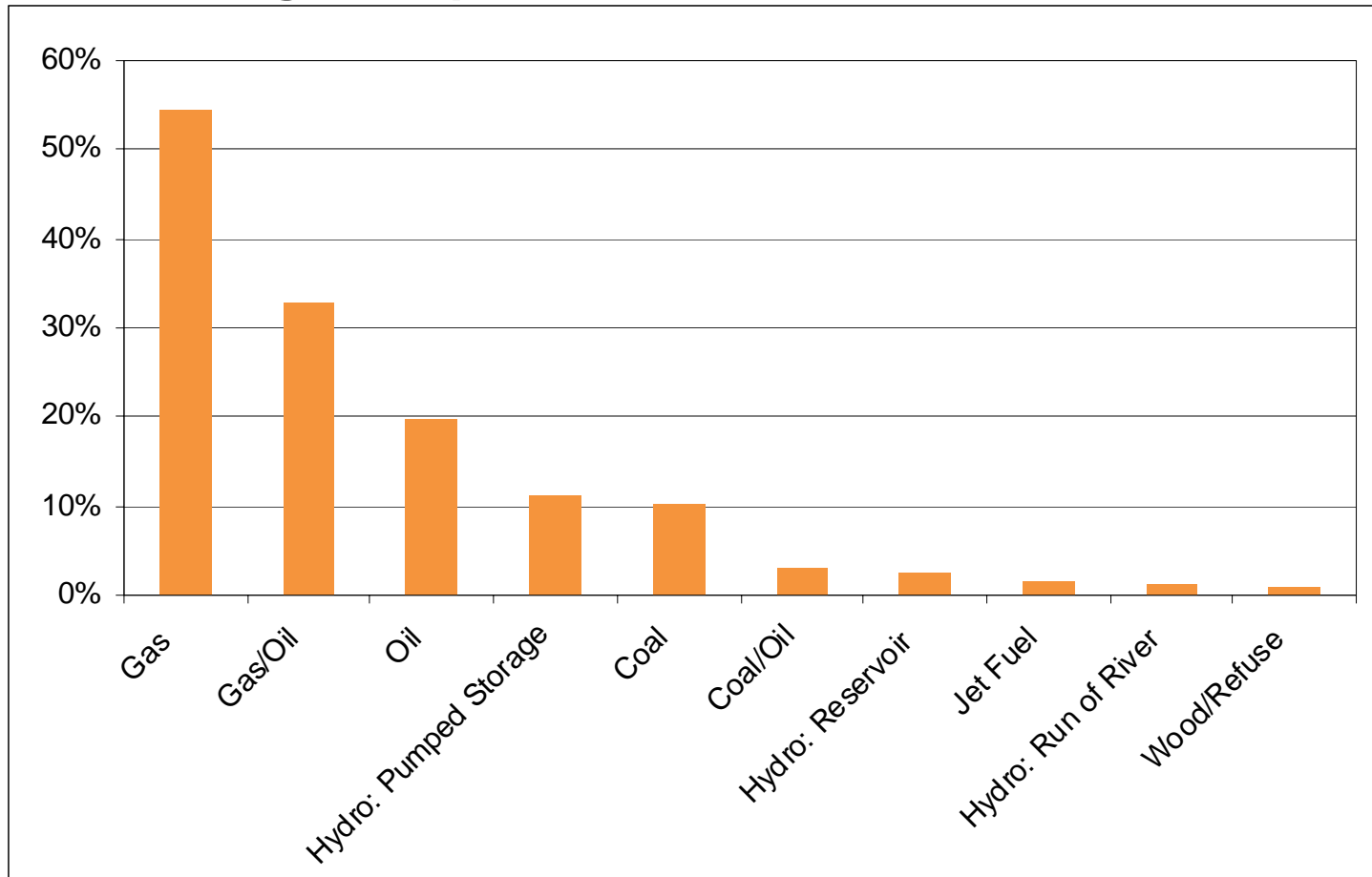


Electricity Prices Influenced By Rising Fuel Prices

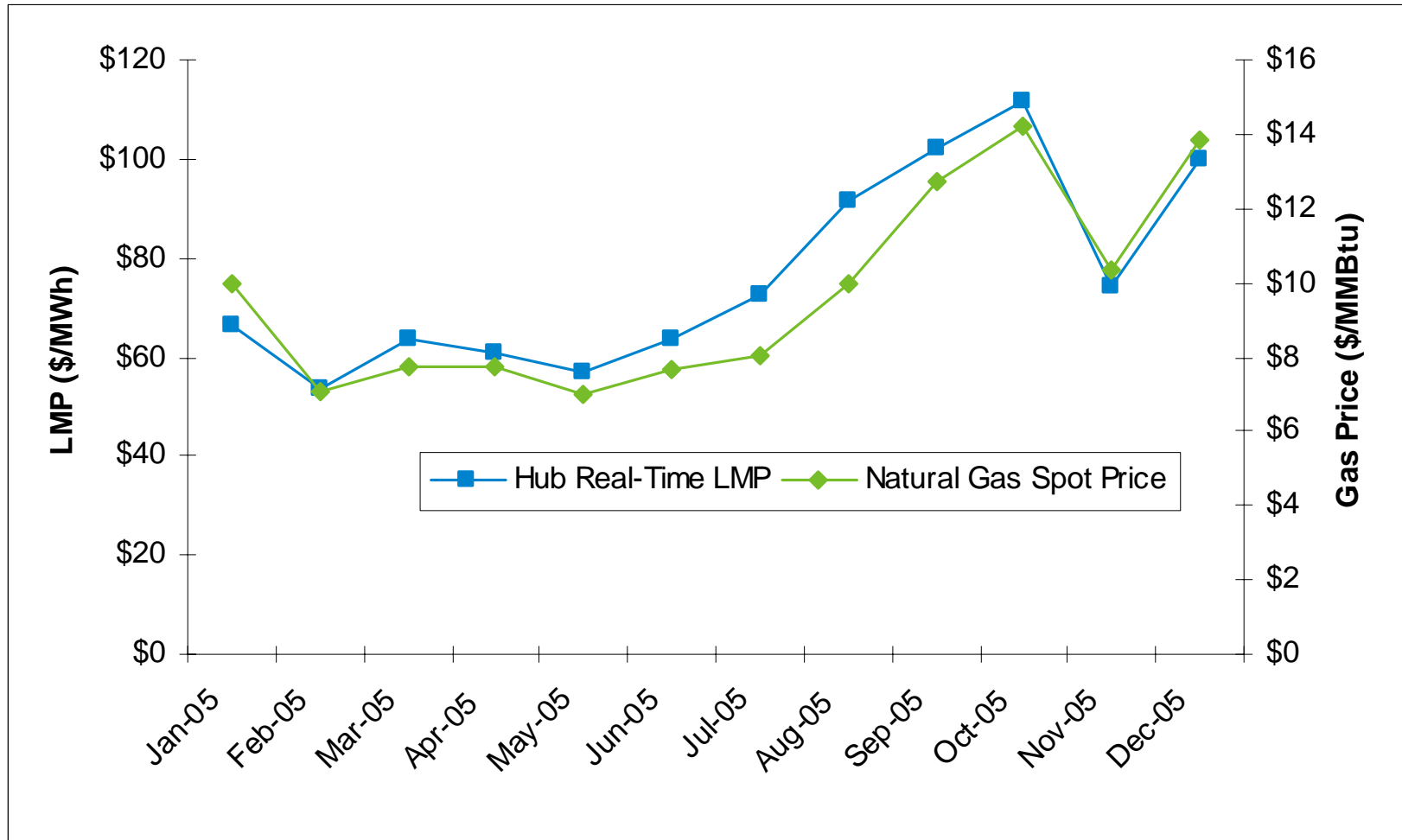
- Nearly half of New England capacity is natural gas-fired or oil-fired
- Fuel is the largest component of generators' marginal costs
 - Natural gas prices increased 44% from 2004 levels
 - Oil prices increased 32% from 2004 levels
- Units burning these fuels set wholesale electricity prices 87% of the time in New England
 - Average real-time price \$79.96 kWh was 47% higher than 2004
 - Fuel-adjusted price \$44.99 kWh is only 4% higher than 2004

Gas Plants Set Price Most Frequently in New England

Marginal Input Fuels in Real-Time, 2005



Electricity Prices Track Natural Gas Prices

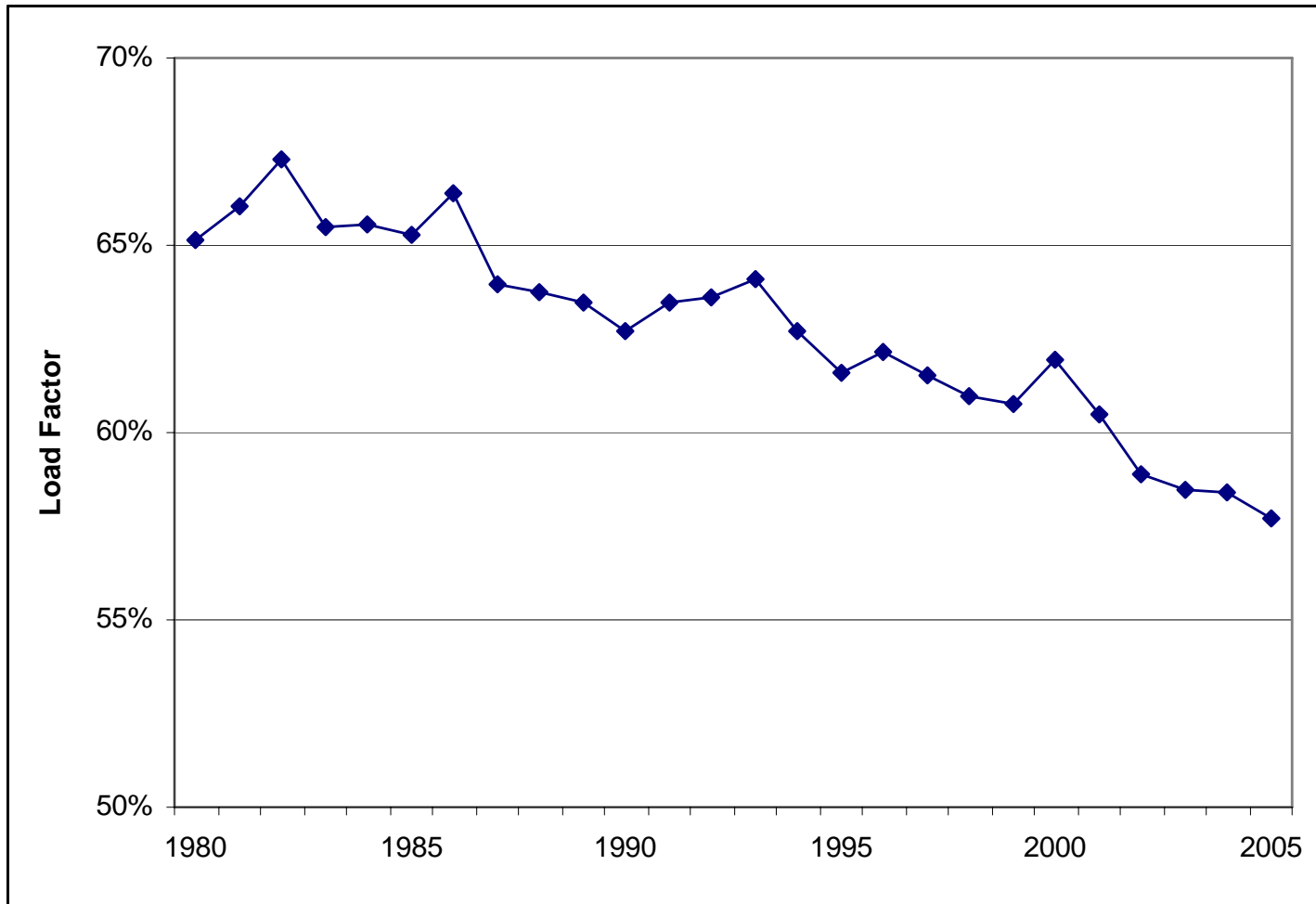


Peak Demand Growth Presents A Continued Challenge

- High peak loads were the result of a hot summer and underlying load growth
 - New record system peak hourly load of 26,885 MW on 7/27/05
 - 6% from previous yearly peak load
 - Total yearly load increased by 2.9% from 2004
 - Expansion of regional economy results in increased electricity consumption
 - Inelasticity of consumer demand is a significant challenge to controlling electricity costs
- Peak demand has been growing faster than average electricity consumption
 - leading to declining capacity utilization

Declining Capacity Utilization

New England Annual Load Factor (1980–2005)

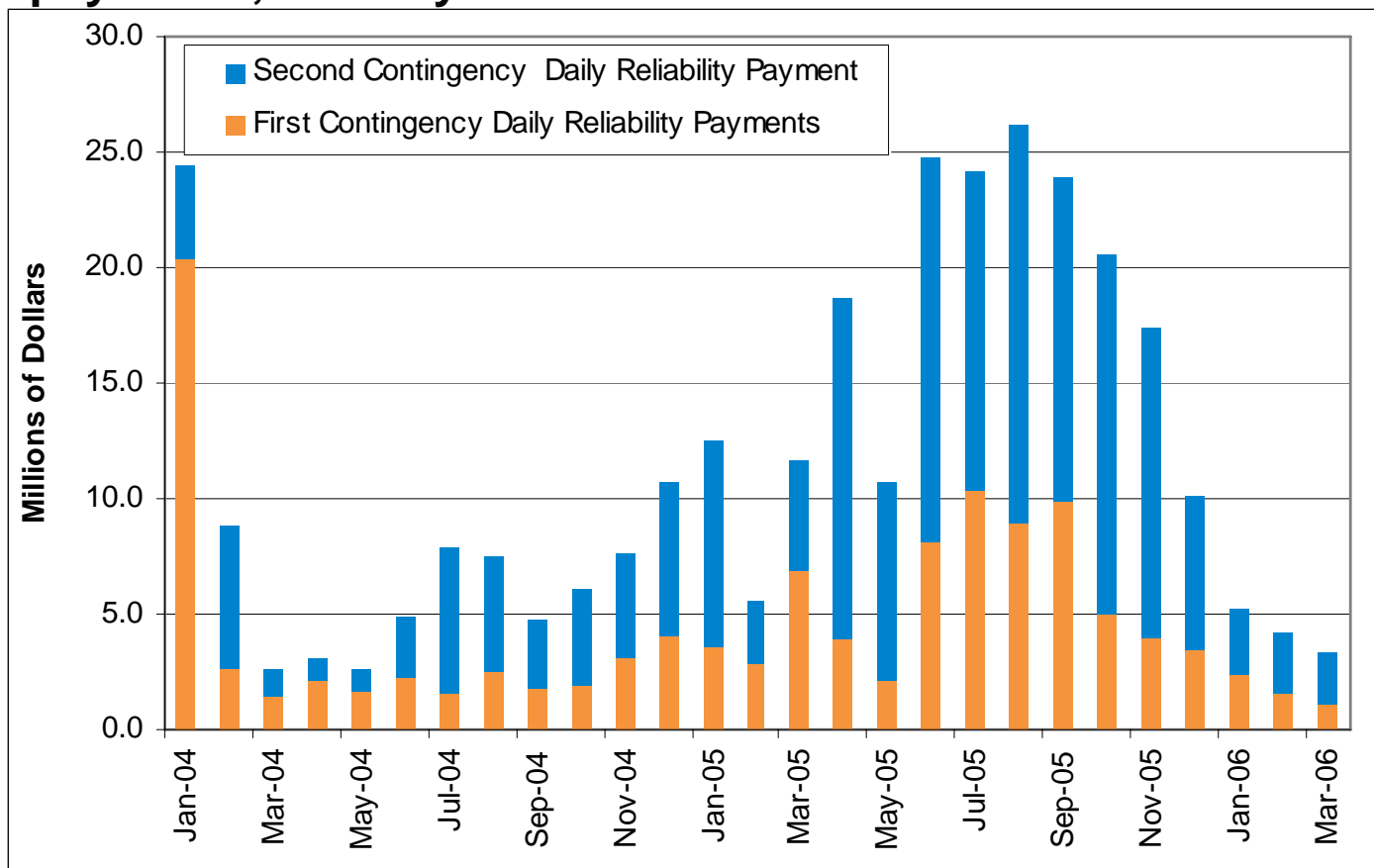


Support of Reliable System Operations

- Wholesale electricity market successfully supported reliable system operations throughout 2005
 - System capacity was adequate to meet record summer loads
 - ISO successfully managed several system events
- Reliability requirements continue to necessitate out-of-market compensation
 - Reliability Agreements total 15% of region's capacity in 2005
 - Net cost - \$240 million (up from \$180 million in 2004)
 - Increase in capacity seeking reliability agreements highlights the need for capacity market improvements
- Daily reliability payments
 - Second-contingency payments for local reserves
 - Voltage support/control and local distribution system support
 - First-contingency payments for system-wide reserves

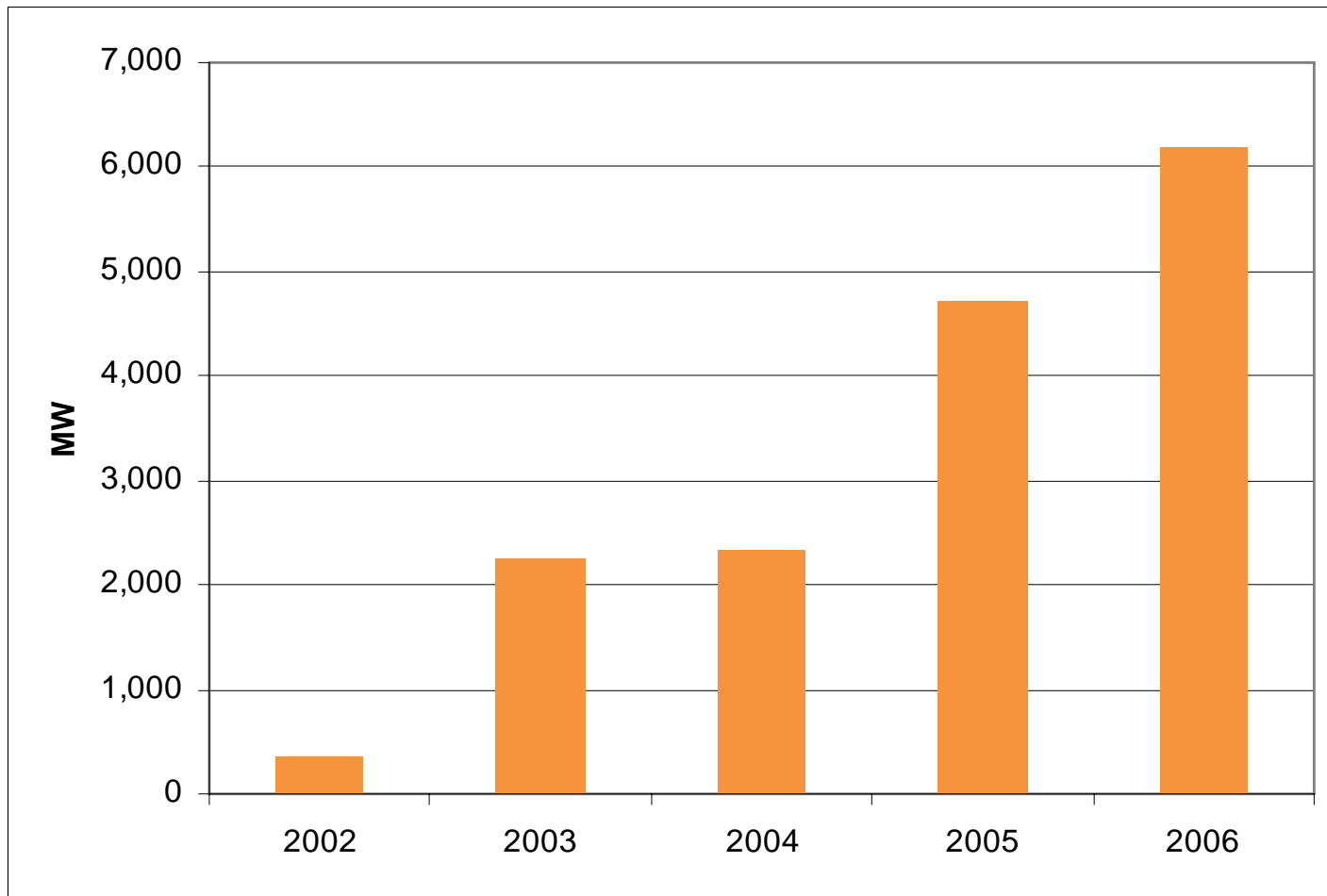
Daily Reliability Payments Remain Significant

Monthly first- and second-contingency daily reliability payments, January 2004 to March 2006



Capacity Under Reliability Agreements Increasing

(Total System Capacity 30,895 MW)



Long-Term Investment

- Investment in transmission was active
 - Several important projects underway
 - Will alleviate congestion and voltage control issues in Connecticut and into Boston
- Investment in generation was inadequate
 - Only 92 MW of new capacity came on-line in 2005
 - Compared to 656 MW in 2004 and 2,949 MW in 2003
- As a result of inadequate generation investment, New England could face electricity shortages in 2007-2009 timeframe
- Additional market incentives are needed to ensure sufficient investment
 - ASM II and the Forward-Capacity Market (FCM)

Market Improvements in 2005

- Phase I of the Ancillary Services Market (ASM I) included introduction of a new Regulation Market in November
 - Compensates generation needed to manage constant small changes in system load
 - Regulation Market is working as designed, although regulation costs initially increased due to transition
- Market rule changes were initiated by the ISO and approved by FERC
 - Prevent inappropriate increases of market-mitigation reference levels
 - Revise method for allocating costs of real-time second-contingency commitments

Planned Market Improvements

- Forward-Capacity Market (FCM) filed with FERC in March 2006 replaces LICAP proposal
- Phase II of Ancillary Services Market (ASM II) is scheduled for 2006
 - Designed to induce new investment in resources to serve peak load
 - Includes a Locational Forward Reserve Market (LFRM) and real-time reserve pricing
 - Provides for demand-side participation in energy and reserve markets

Additional Issues Facing The Market

- Over-reliance on oil and natural gas
 - Rising natural gas and oil prices make alternative generation resources more attractive
 - Siting problems have prevented their introduction
- Wholesale and retail electricity prices disconnected
 - Peak growing faster than total growth, i.e., declining capacity utilization
 - Time differentiated retail rates could help bring growth of peak demand more in line with total growth

*These issues are not likely to be addressed
by the markets alone*

State Of The Markets

- Energy Market
- Imports and exports
- Price separation and congestion
- Forward Reserve Market
- Installed Capacity Market
- Regulation Market
- Demand Response
- Generator performance

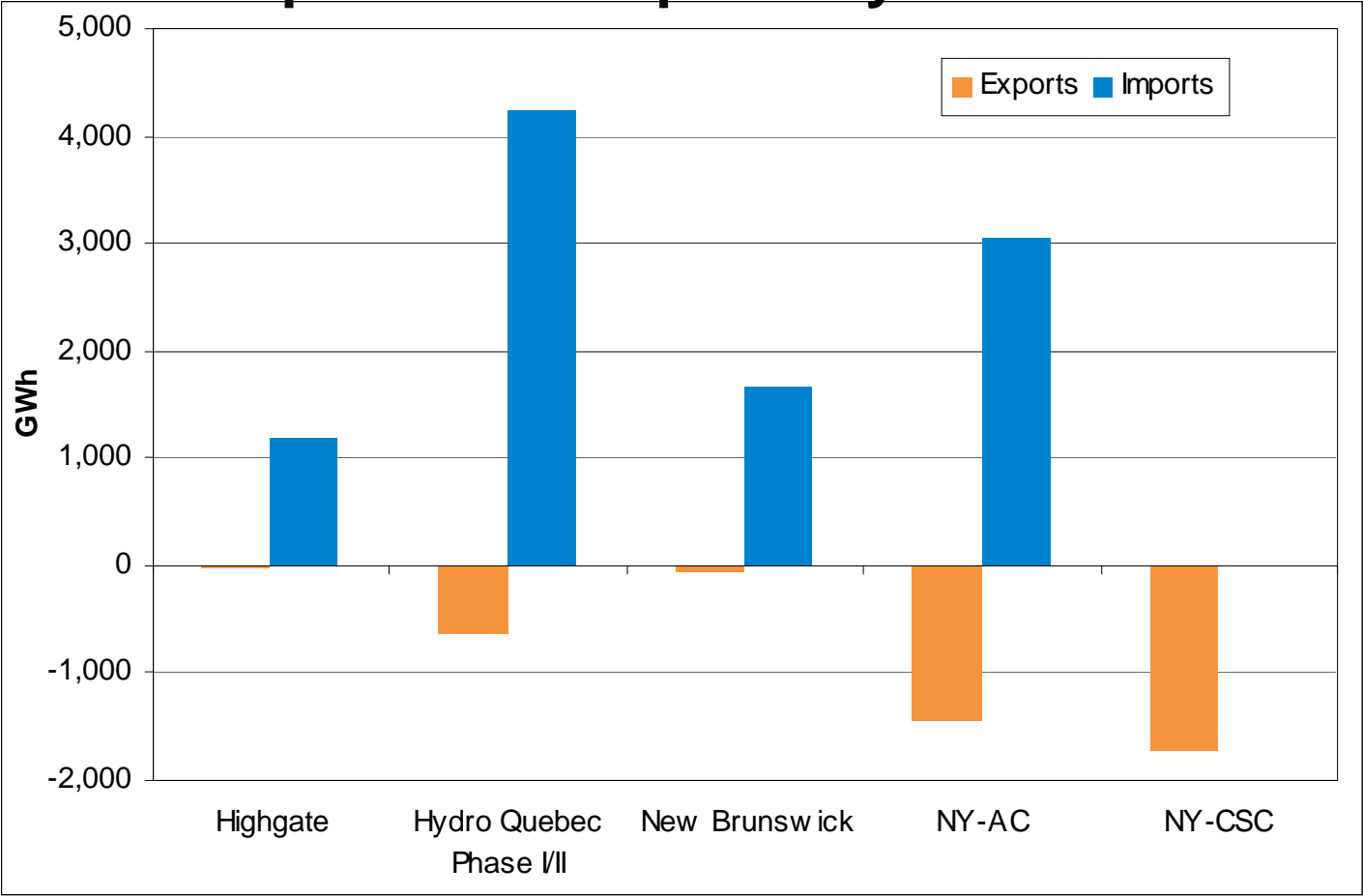
Energy And Peak Load Increased

Annual Electric Energy And Peak Statistics

Energy Concept	2005	2004	Change	% Change
Annual NEL (MWh)	136,375,000	132,522,000	3,853,000	2.9%
Normalized NEL (MWh)	134,224,000	131,753,000	2,471,000	1.9%
Recorded peak load (MW)	26,885	24,116	2,769	11.5%
Normalized peak load (MW)	26,545	25,760	785	3.0%

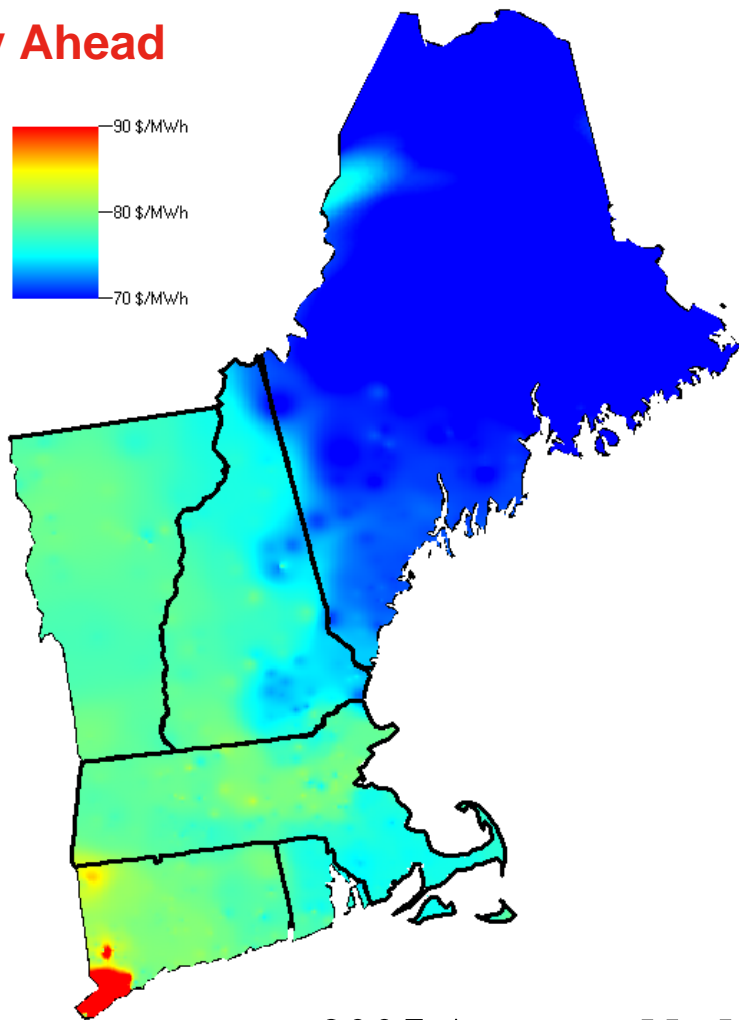
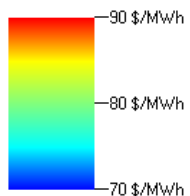
New England Remains a Net Importer

Imports and Exports by Interface

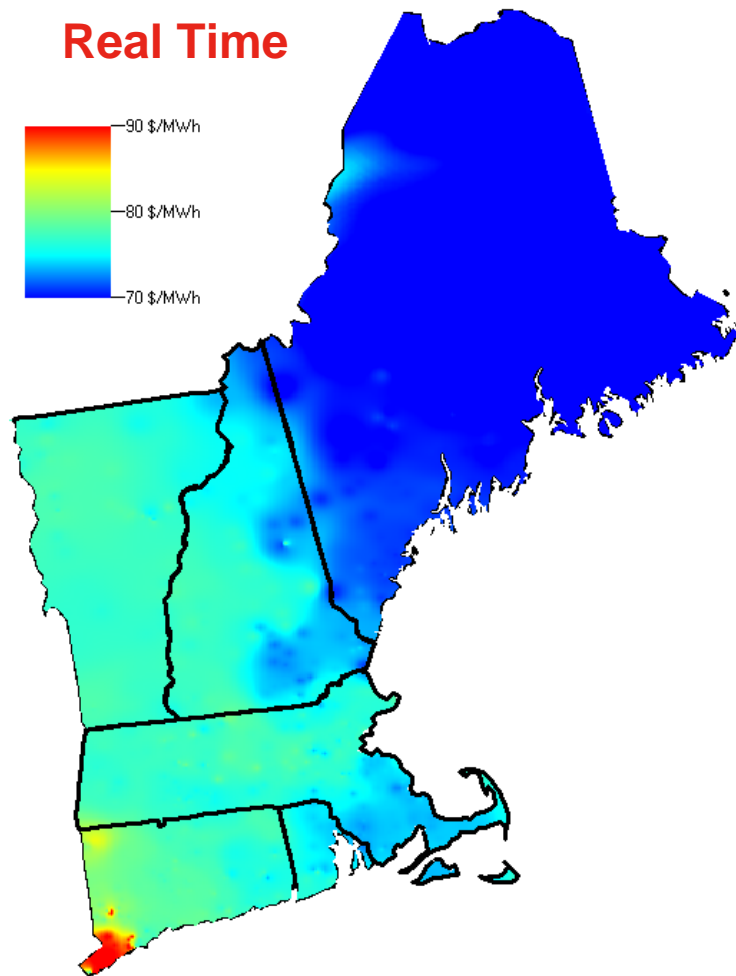
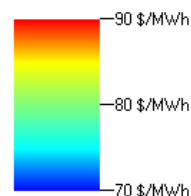


Price Separation Remains High

Day Ahead

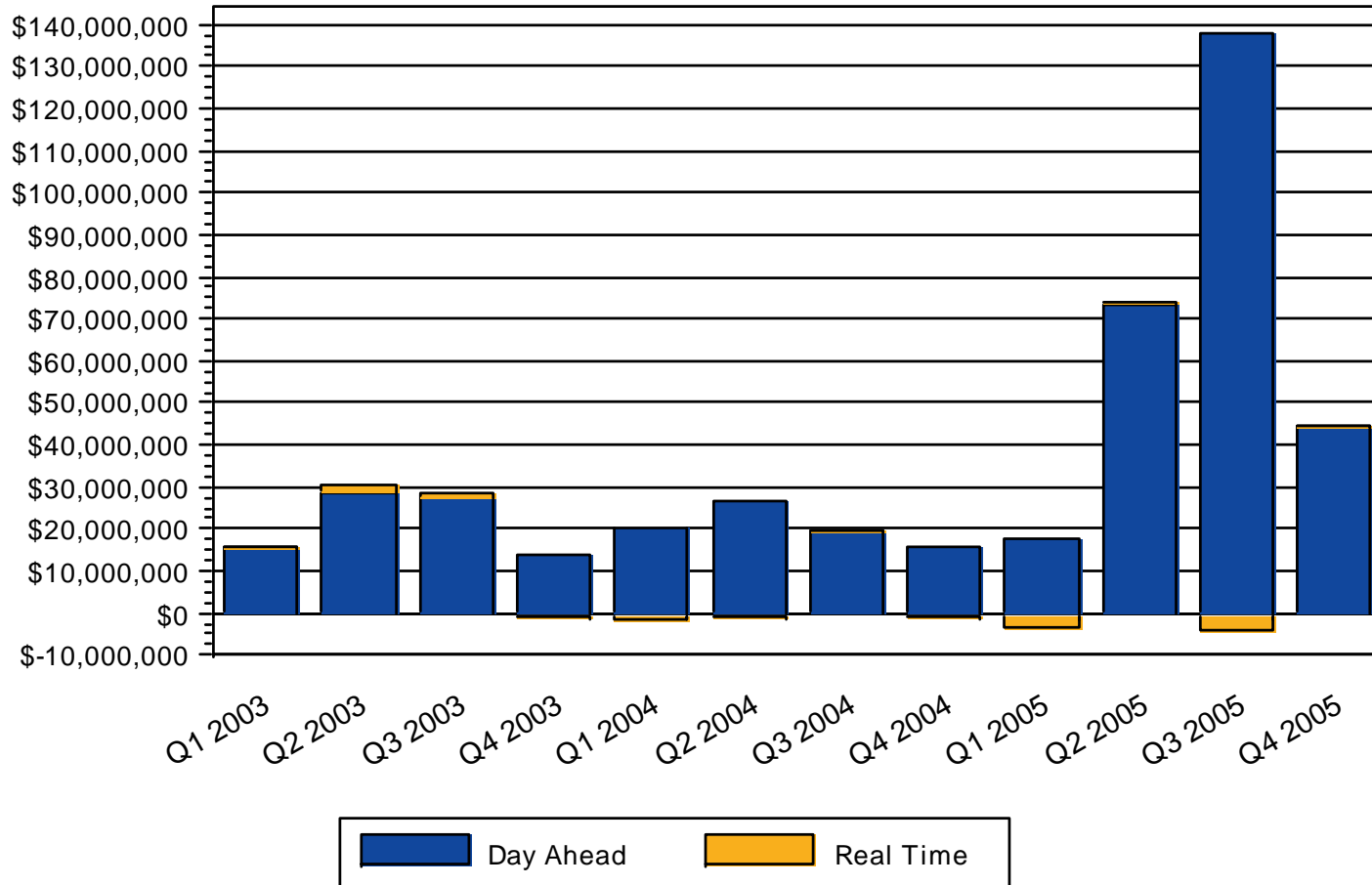


Real Time



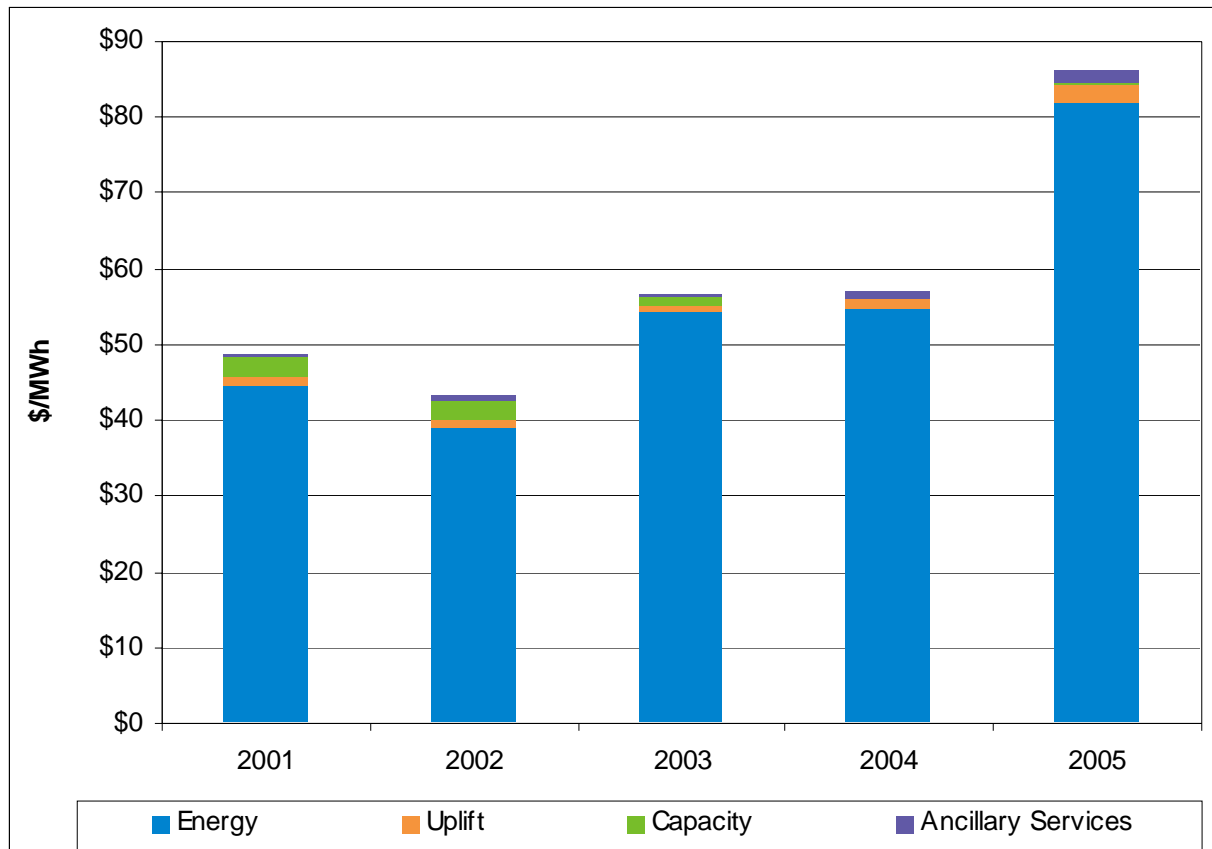
2005 Average Nodal Prices (\$/MWh)

Congestion Costs Increased



All-In Market Cost Metric: 2002 - 2005

New England Wholesale Electricity Market Cost Metric: Energy, Uplift, Capacity, Ancillary Services \$/MWh



Forward Reserve Market (FRM)

- Since inception of FRM in 2004, supply offer has increased and clearing price has fallen
- FRM auction clearing prices declined significantly
 - \$4,495 MW-Month in early 2004 auction
 - \$2,000 MW-Month in winter 2005 - 2006 auction
- Total power clearing remained relatively constant at 1,900 - 2,100 MW
- Total payments to generators ~ \$61 million

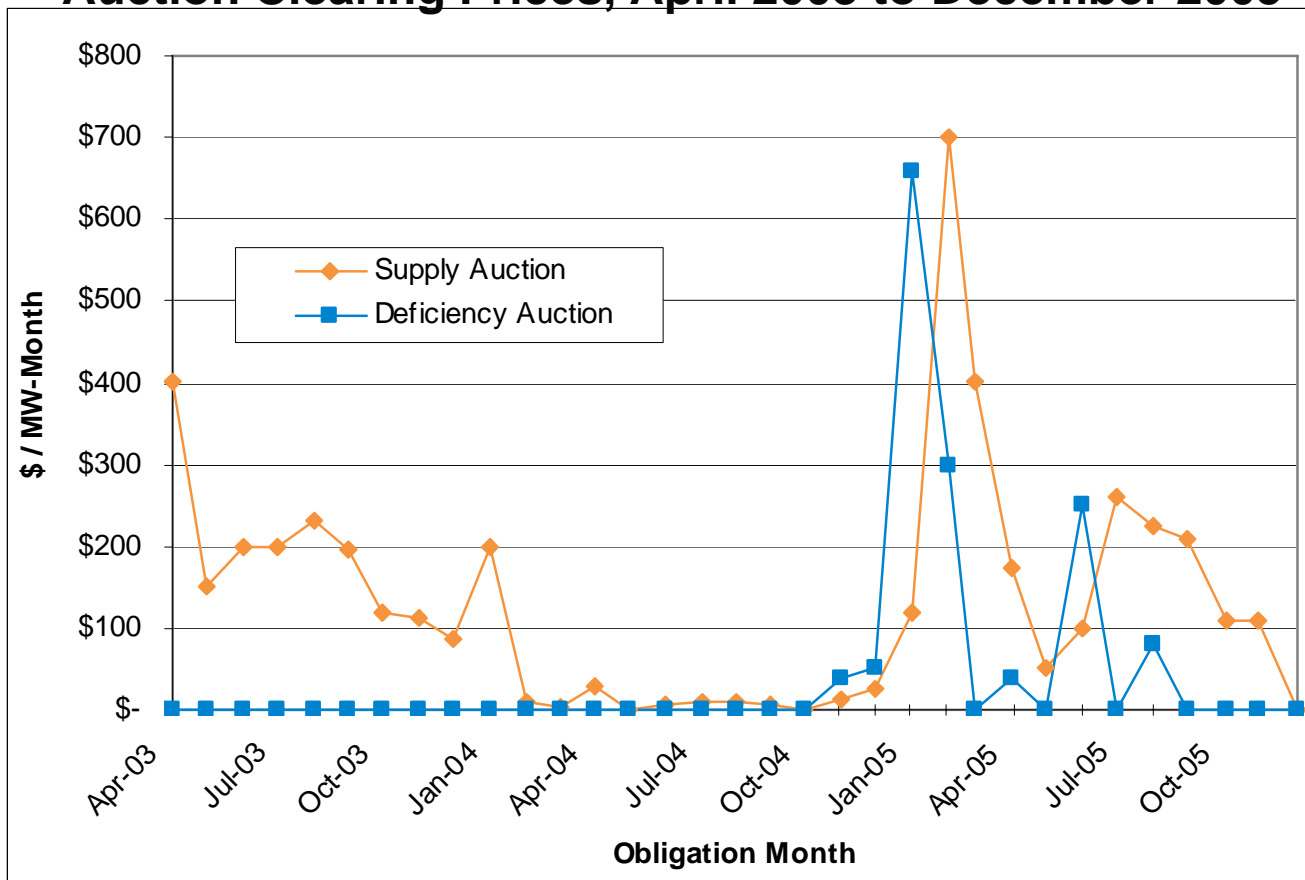
Installed Capacity Market (ICAP)

- ICAP market prices were higher and more volatile during 2005 than during 2004
 - Prices ranged from \$700 MW Month to zero in 2005
- On average, about 10% of system capacity was met through supply and deficiency auctions
- Remaining system capacity was met through self-supply or bilateral contracts

Capacity Market Prices

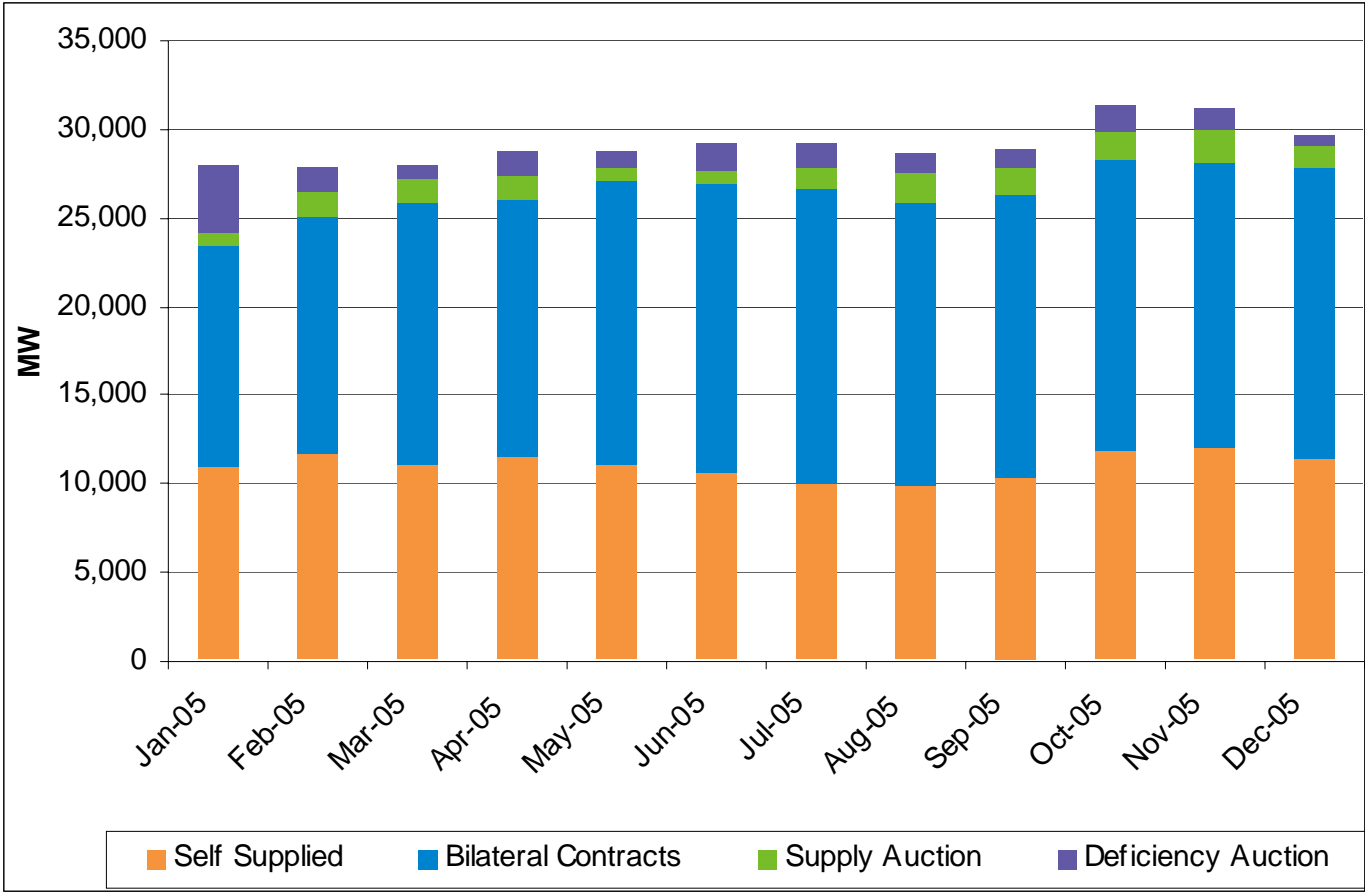
2005 Capacity Market prices higher and more volatile

Auction Clearing Prices, April 2003 to December 2005



About 10% Of Capacity Obtained By Auction

Sources of Capacity (MW) in 2005 SMD ICAP Market

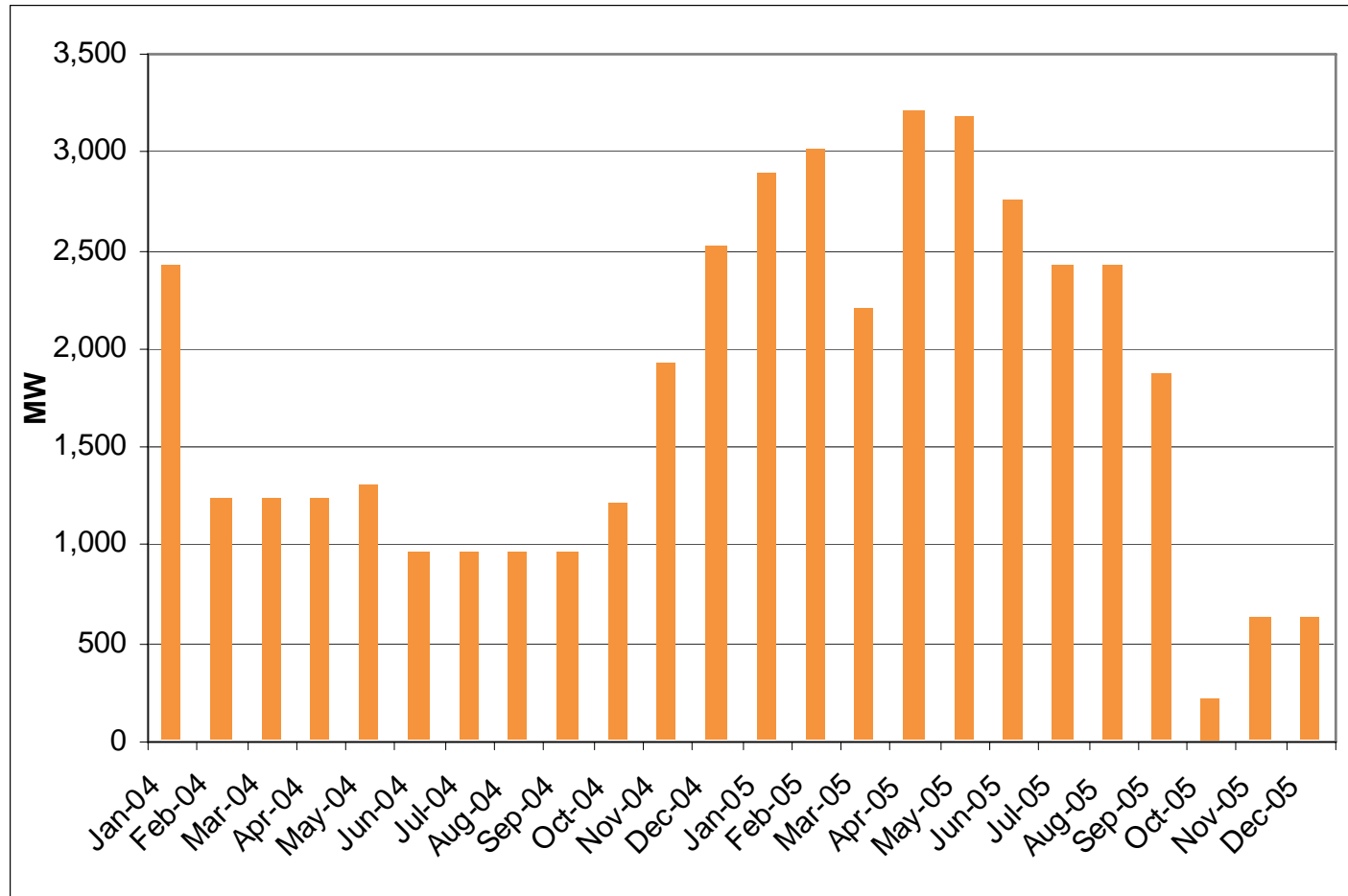


ICAP: Delisted Capacity

- After rising during the first part of the year, the total delisted capacity showed a strong downward trend starting in June
 - NEMA and CT load zones saw delisted capacity fall to zero in the second half of the year
- Effective March 2005, a portion of a generator could delist as an ICAP source
 - Previously, participants had to delist entire generator's capacity
 - Only 1 generator used this market feature in 2005, during 3 months over the summer

Delisted Capacity Increased, Then Decreased

Total Delisted Capacity, January 2004 to December 2005



Regulation Market

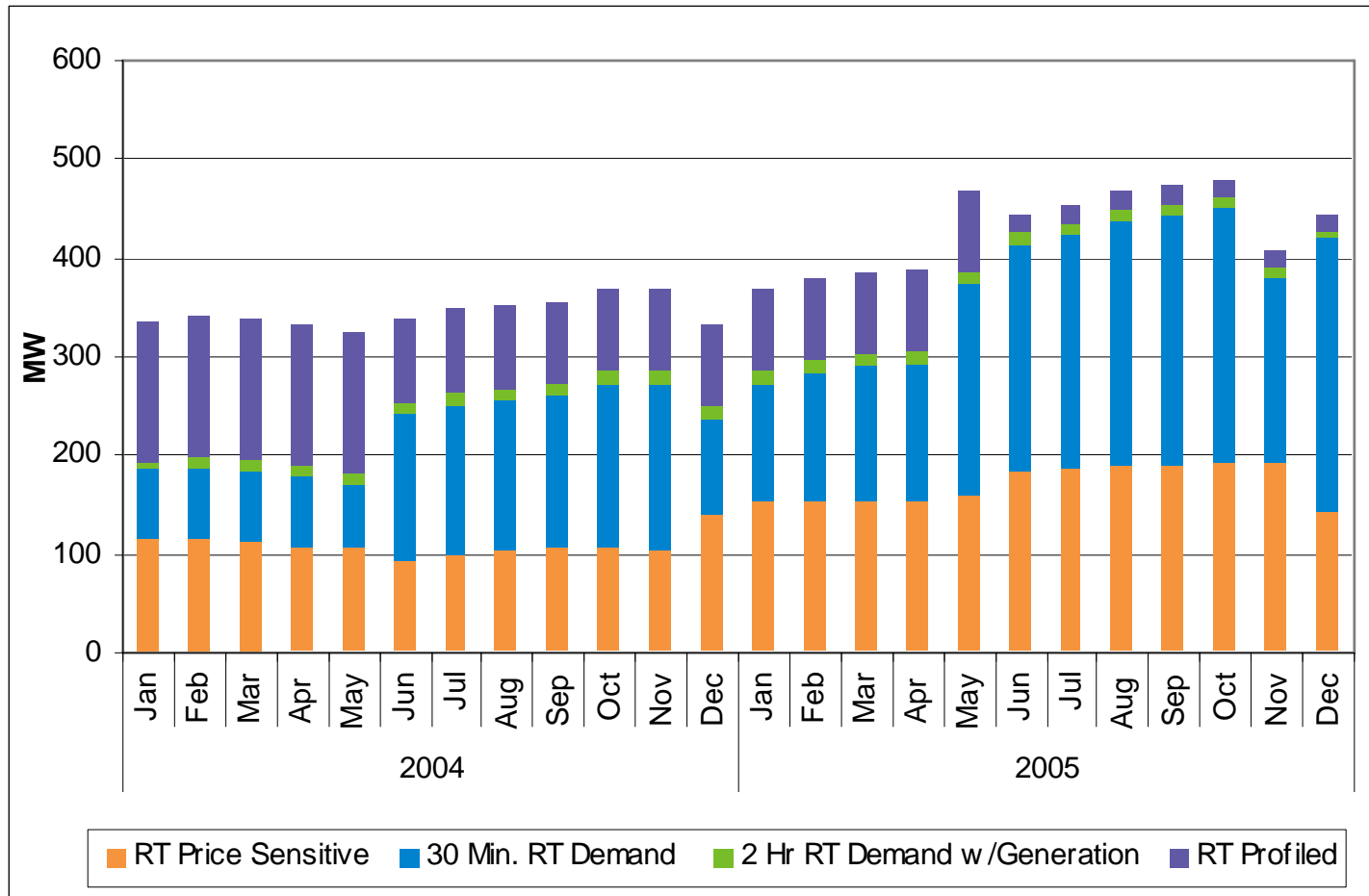
- The revised Regulation Market began on October 1, part of ASM Phase I
- Market performed effectively
 - NE Control Area complied with NERC Regulation Requirements
- Regulation Market clearing price averaged \$30.22/MWh
- Payments made to generators providing regulation service totaled \$69.5 million
 - Including \$15 million in real-time opportunity-cost payments
- Initial costs increased due to:
 - Transition to new market design
 - Coincident high gas and electricity prices, which caused high opportunity cost payments

Demand Response (DR)

- Overall enrollment increased by 25%
 - 781 assets (more than 472 MW) under DR contracts
 - 330 MW of additional DR enrolled in Winter Response Program, but were not activated
 - Total enrolling participant payments = ~ \$43 million
 - \$7.1 million in DR program payments
 - \$35.9 million in SWCT “Gap” RFP payments
- New Day-Ahead Load-Response Program
- DR programs resulted in reduced energy consumption by more than 66,251 MWh

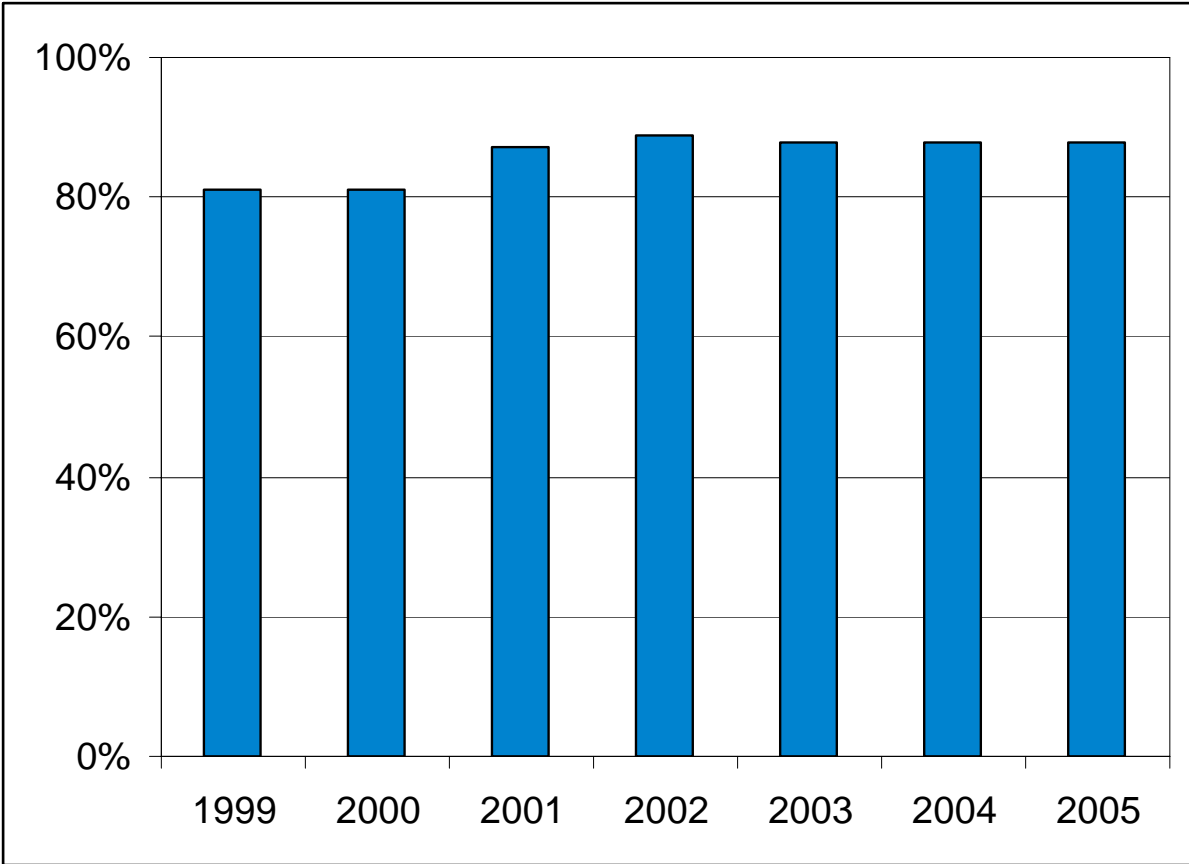
Demand Response Participation

Monthly Enrollments in Demand-Response Programs, 2004 and 2005



Generator Performance Remains Steady

Annual Weighted Equivalent Availability Factors



2005 Market Conclusions

- Electricity prices are heavily influenced by fuel costs
 - To control costs, the region must reduce its reliance on fossil fuels with volatile prices
 - Implementation of ASM II and a capacity market solution will provide incentives for investment
 - Siting of baseload resources remains a problem
- Declining load factor poses the risk of increased costs
 - Linking wholesale and retail electricity prices to help bring growth of peak demand more into line with average demand
 - Efficiency, conservation and DR initiatives to control peaks
- Continuing transmission investment will help relieve congestion and reduce out-of-market costs required for reliability