



2008 State of the Market Report New York ISO Electricity Markets

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May 2009

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Executive Summary: Introduction

- This presentation provides the results of our assessment of the performance of the New York electricity markets in 2008.
- The New York ISO (“NYISO”) operates the most complete set of electricity markets in the U.S. These markets provide substantial benefits:
 - ✓ Day-ahead and real-time markets jointly optimize energy, operating reserves and regulation. These markets lead to:
 - Prices that reflect the value of energy at each location on the network;
 - The lowest cost resources being started each day to meet demand;
 - Delivery of the lowest cost energy to New York’s consumers to the maximum extent allowed by the transmission network; and
 - Efficient prices when the system is in shortage.
 - ✓ Capacity markets that ensure that the NYISO markets produce efficient long-term economic signals to govern decisions to:
 - Invest in new generation, transmission, and demand response; and
 - Maintain existing resources.
 - ✓ The market for transmission rights allows participants to hedge the congestion costs associated with using the transmission network;



Executive Summary: Unique Aspects of the NYISO Markets

- The performance of the New York markets is enhanced by a number of attributes that are unique to the NYISO:
 - ✓ *A real-time dispatch system that is able to optimize over multiple periods (up to 1 hour), which allows the market to anticipate upcoming needs and move resources to efficiently satisfy the needs.*
 - ✓ *An optimized real-time commitment system to start gas turbines and schedule external transactions economically – other RTOs rely on their operators to determine when to start gas turbines.*
 - ✓ *A mechanism that allows gas turbines to set energy prices when they are economic – gas turbines frequently do not set prices in other areas because they are inflexible, which distorts prices.*
 - ✓ *A mechanism that allows demand-response resources to set energy prices when they are needed – this is essential for ensuring that prices signals are efficient during shortages. DR in other RTOs has distorted real-time signals by undermining the shortage pricing.*

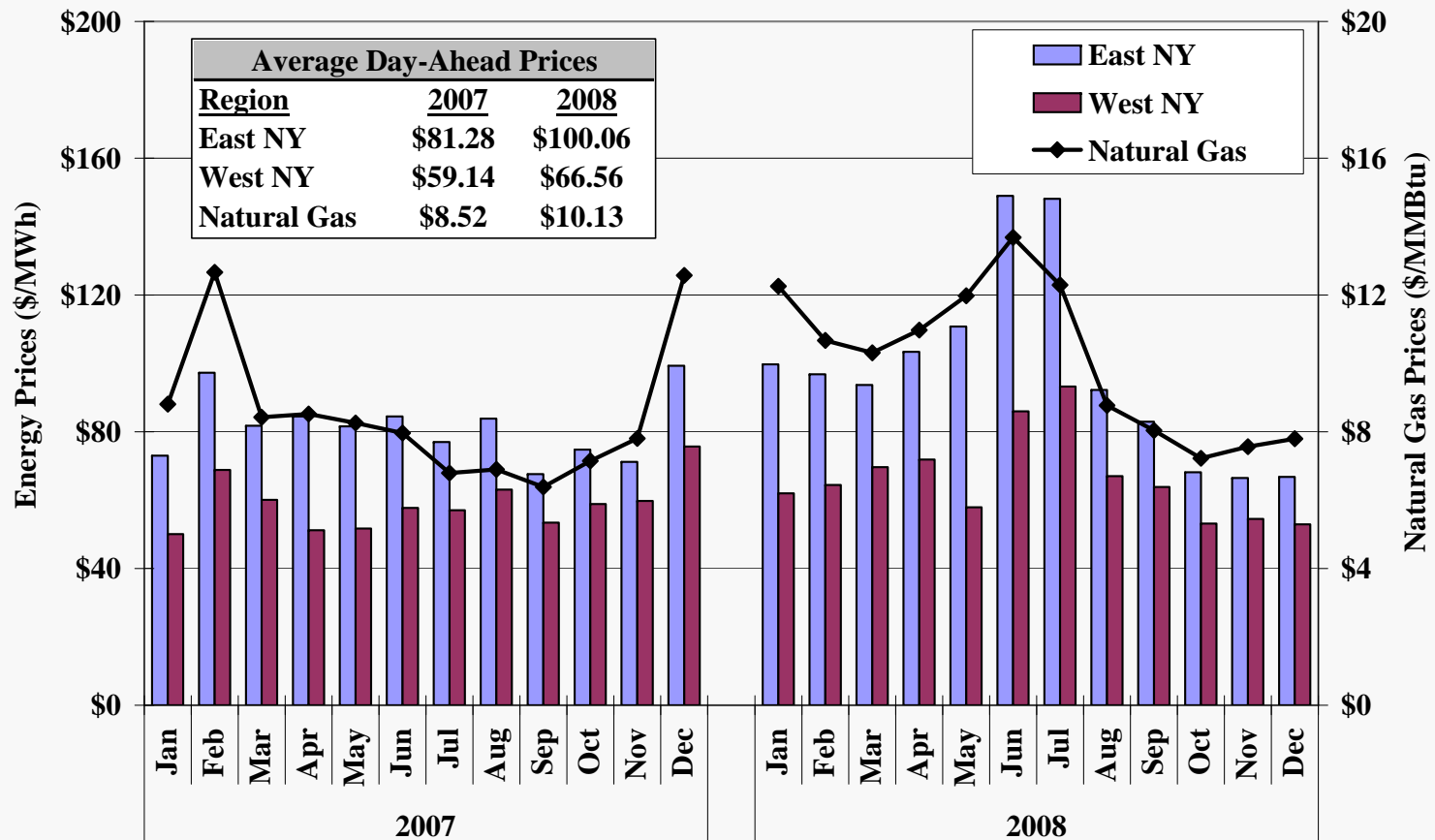


Executive Summary

Market Performance and Prices

- The energy and ancillary services (operating reserves and regulation) markets performed competitively in 2008.
 - ✓ This report shows no evidence that suppliers have been withholding generation to inflate energy or ancillary services prices.
 - ✓ Despite recent allegations, only one-tenth of one percent of generators' offers were made at very high levels, which reasonably reflect emergency supplies and the offers did not materially affect prices.
 - ✓ There were competitive issues in the capacity market until March 2008. Changes in mitigation rules have been made that address the issue.
- Energy prices increased 12 percent in western New York and 23 percent in eastern New York.
 - ✓ This is primarily due to increased fuel prices in 2008. Natural gas prices rose an average of 19 percent, and fuel oil prices rose an average of 40 percent.
 - ✓ There was a considerable increase in congestion across the Central-East and other interfaces that limit flows from western New York to eastern New York, increasing congestion-related price differences between regions.

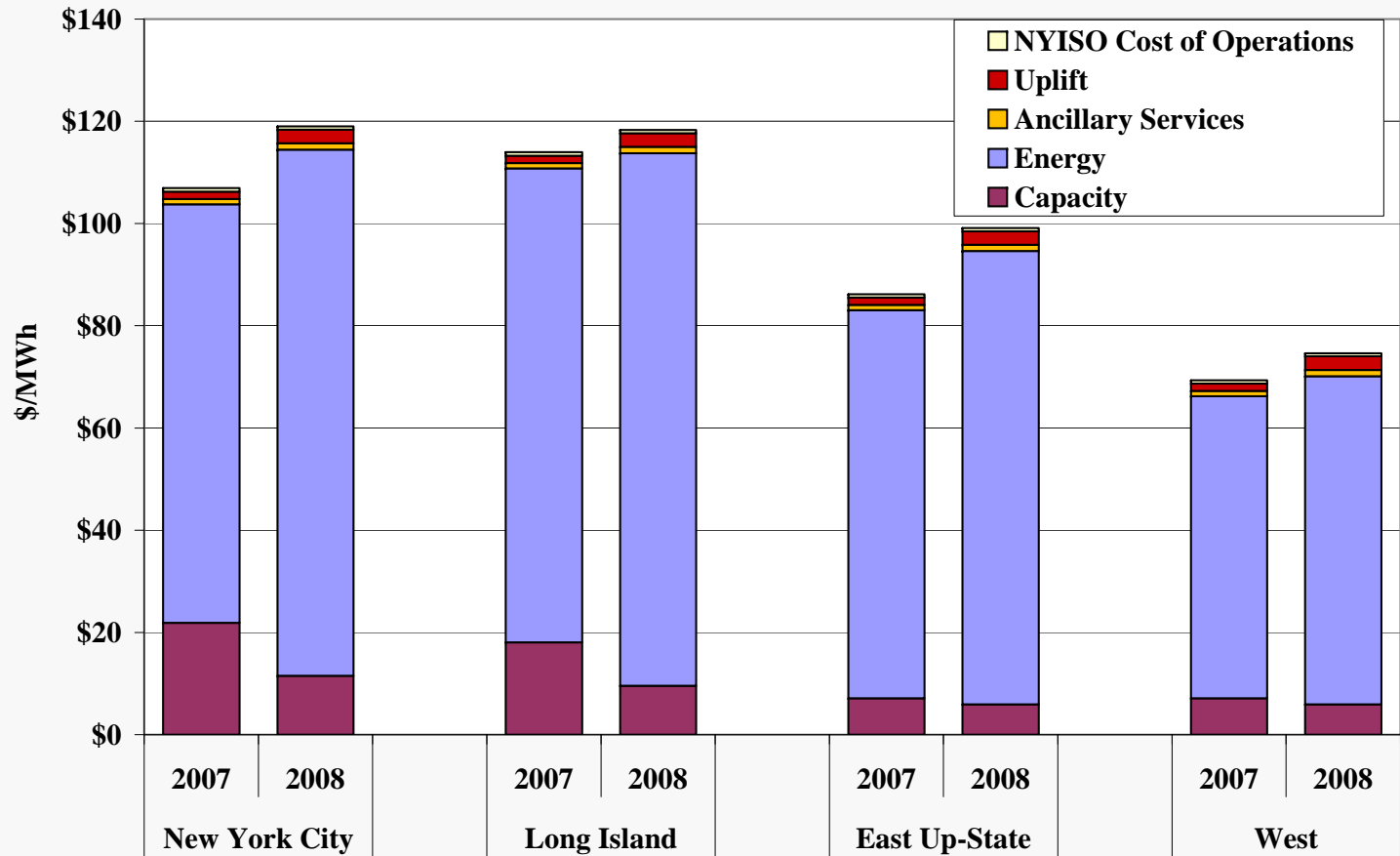
Day-Ahead Electricity and Natural Gas Prices 2007 – 2008 [19]



Note: The electricity prices are load-weighted averages.

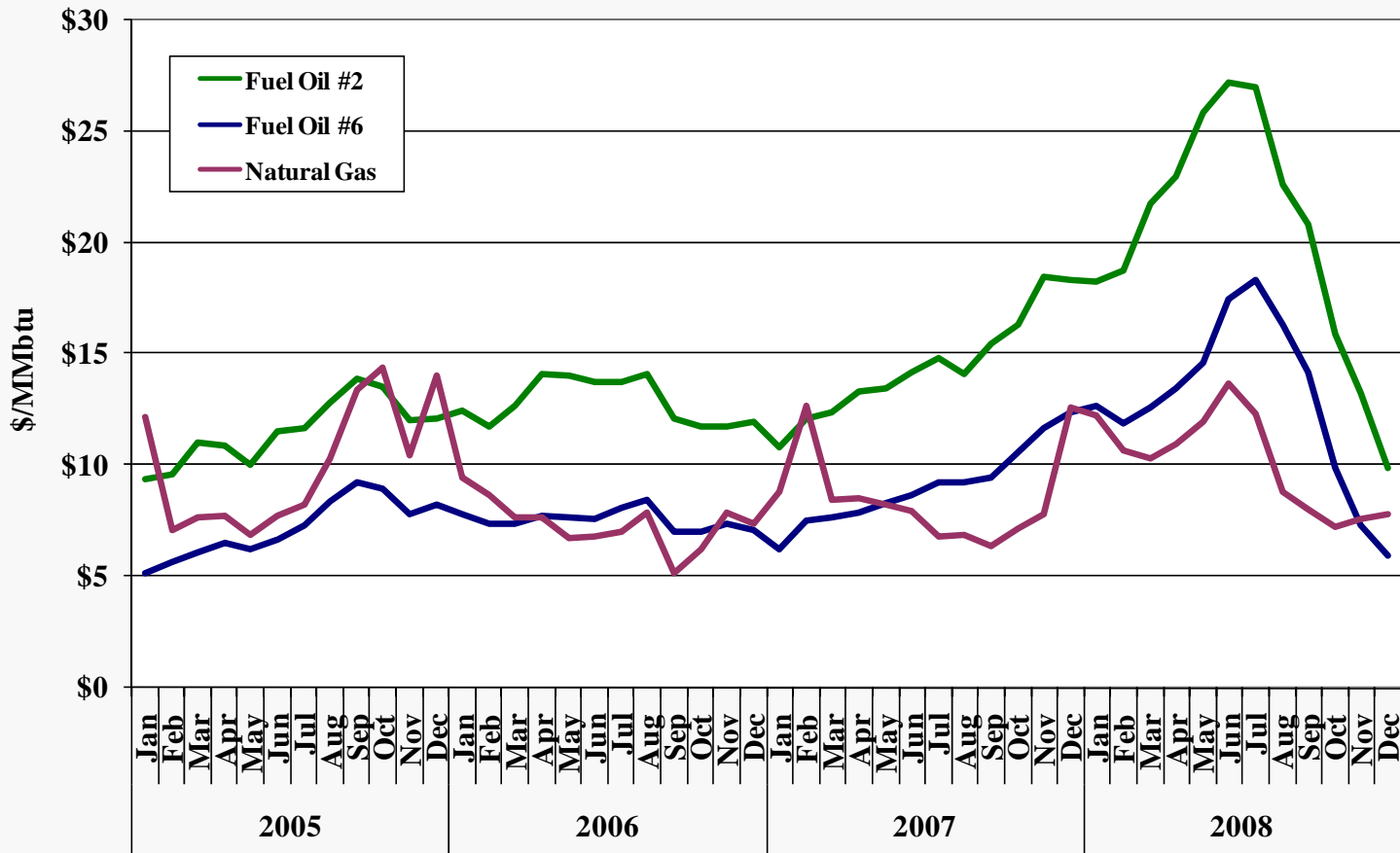


Average All-In Price by Region 2007 – 2008 [21]

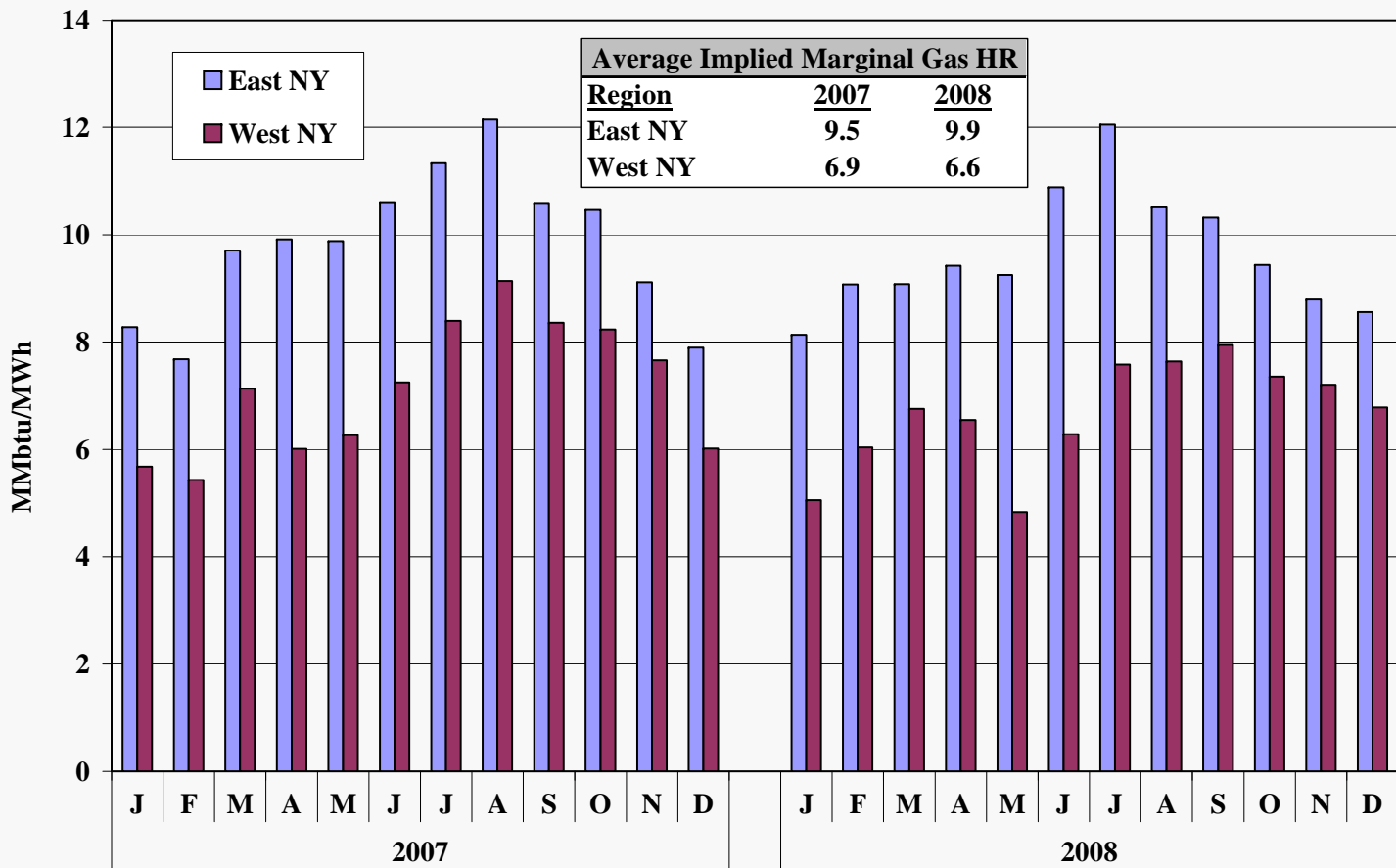




Monthly Average Natural Gas and Oil Prices 2005 – 2008 [29]



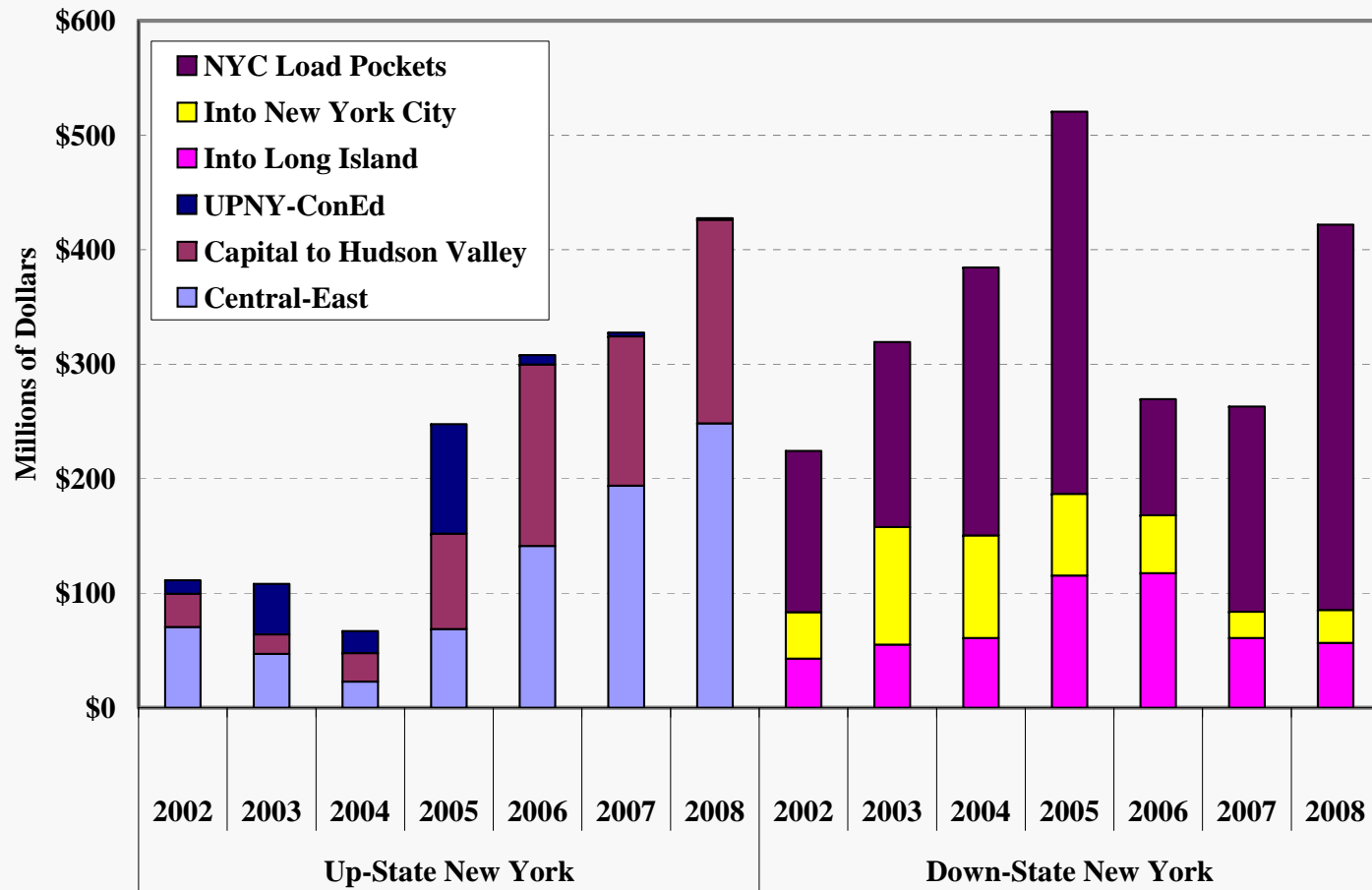
Average Monthly Implied Heat Rate 2007 – 2008 [23]



Note: Implied heat rate is for a natural gas units and is based on day-ahead prices.

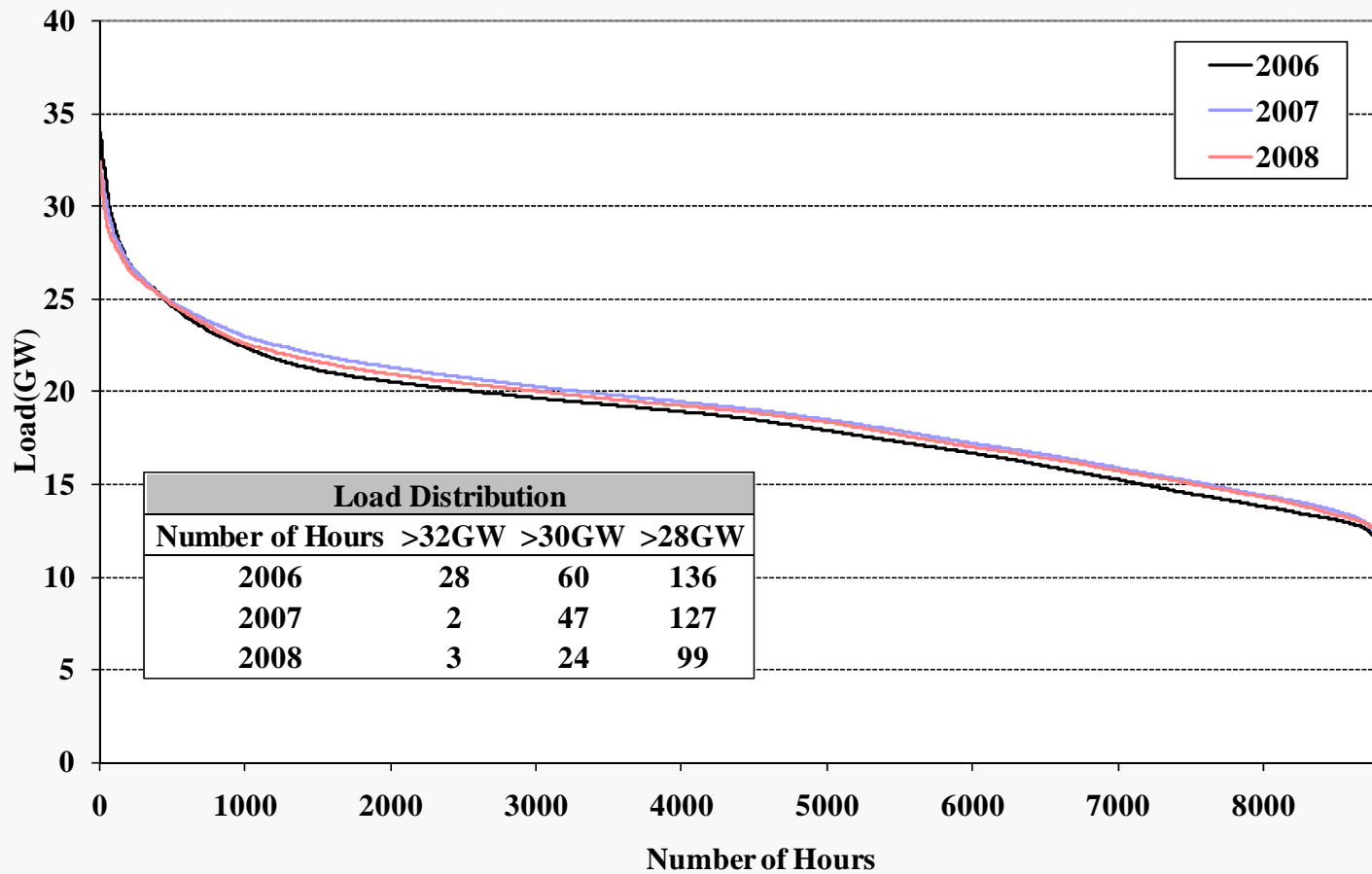


Value of Real-Time Congestion on Major Interfaces 2002 – 2008 [112]

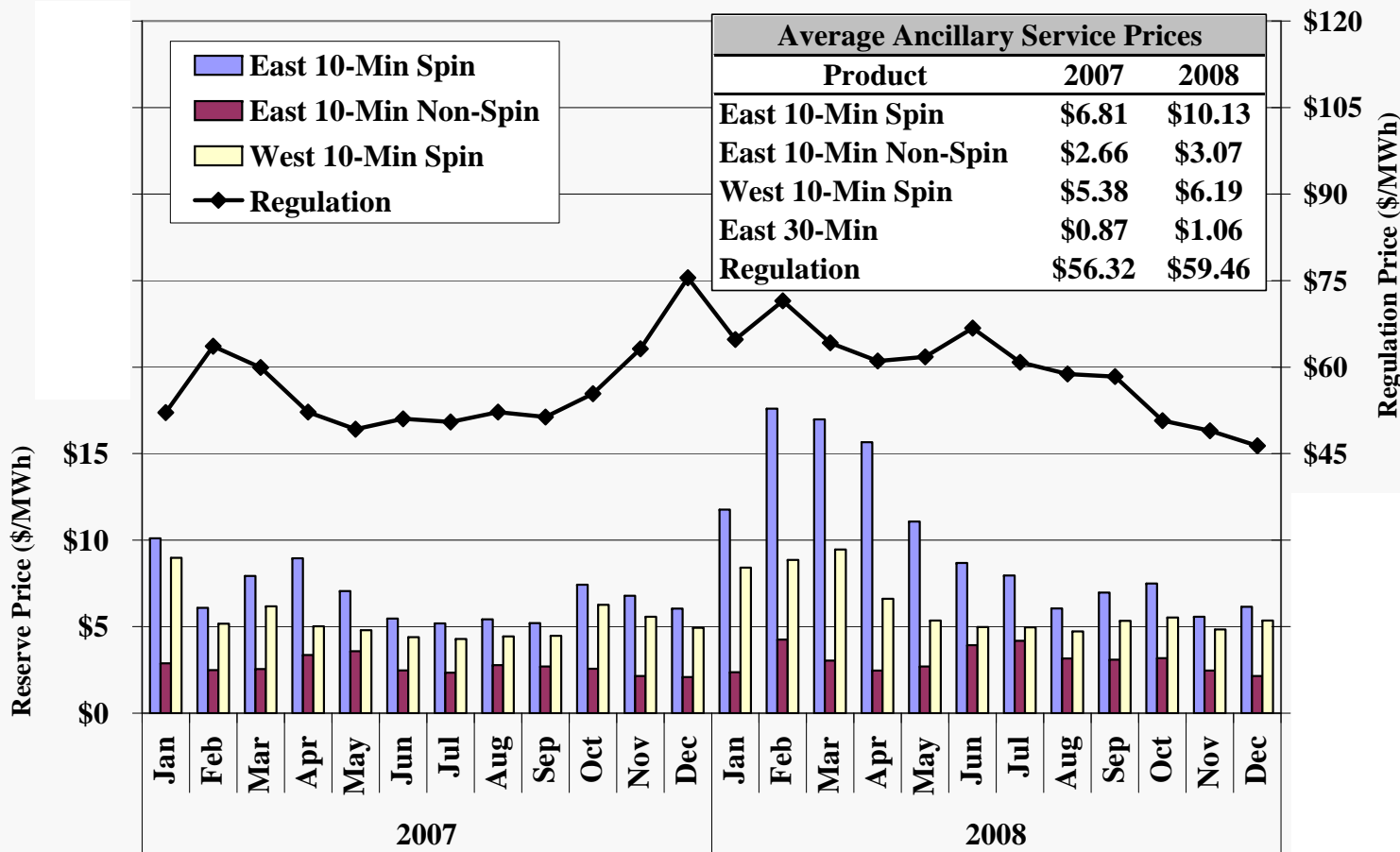




Load Duration Curves New York State Load, 2006 – 2008 [33]



Day-Ahead Ancillary Services Prices 2007 – 2008 [35]





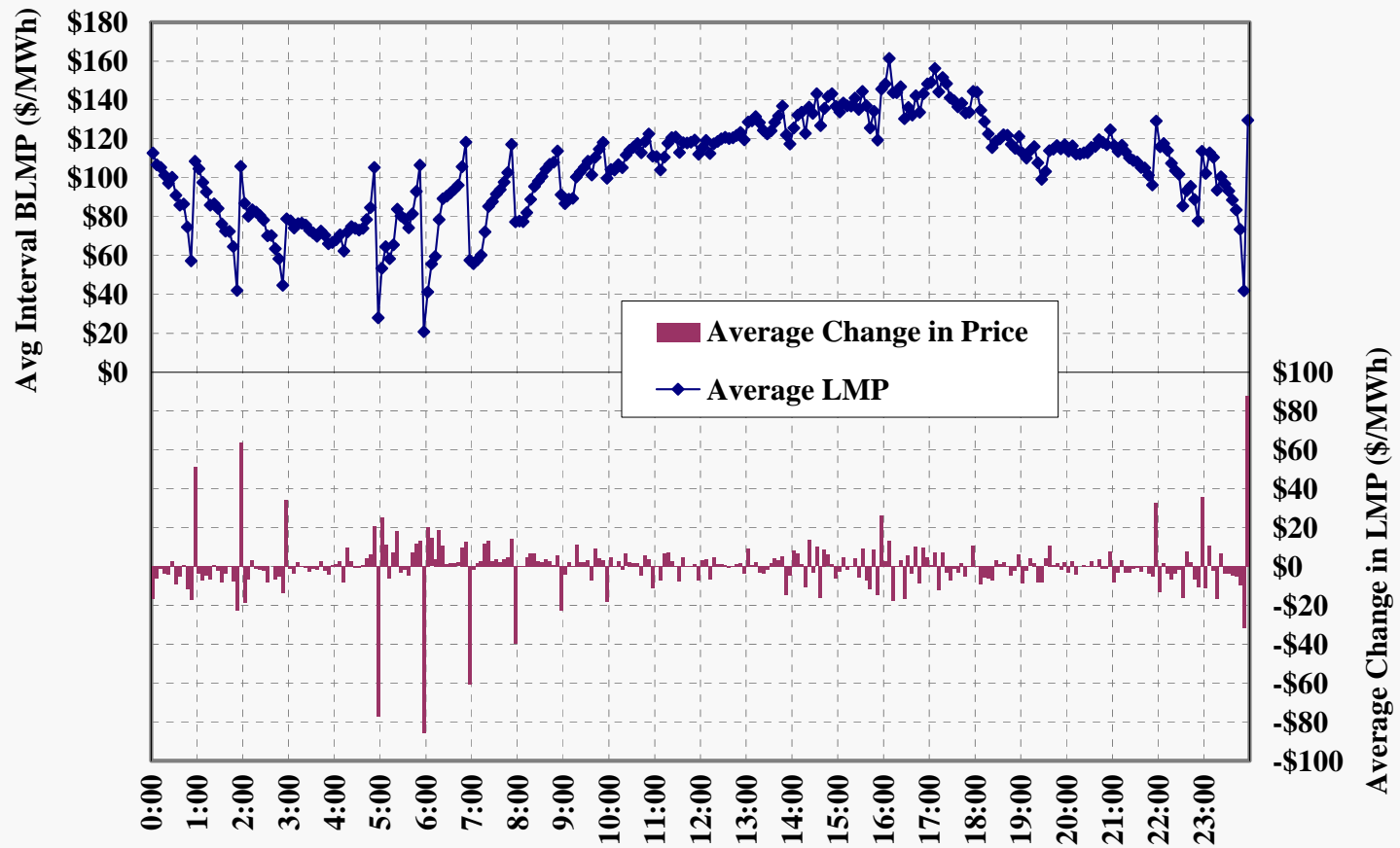
Executive Summary

Market Performance and Prices (cont.)

- There was substantial energy price volatility in the real-time market, particularly at the top-of-the-hour during the morning and evening ramp periods.
 - ✓ The report highlights several factors that contribute to price volatility at the top-of-the-hour, including changes in external transaction schedules and changes in the energy schedules of inflexible generation.
 - ✓ Large schedule changes usually occur at the top-of-the-hour rather than being distributed throughout each hour. Such changes can create brief shortages as the NYISO deploys flexible generation to compensate for these changes.
 - The NYISO has a project to evaluate the causes of price volatility and identify ways to reduce unnecessary price volatility.
- Prices between New York and adjacent markets have not been fully converged.
 - ✓ This is particularly important during peak conditions when adjusting the flow is more likely to have a substantial price impact.
 - ✓ The report includes recommendations to address this issue.

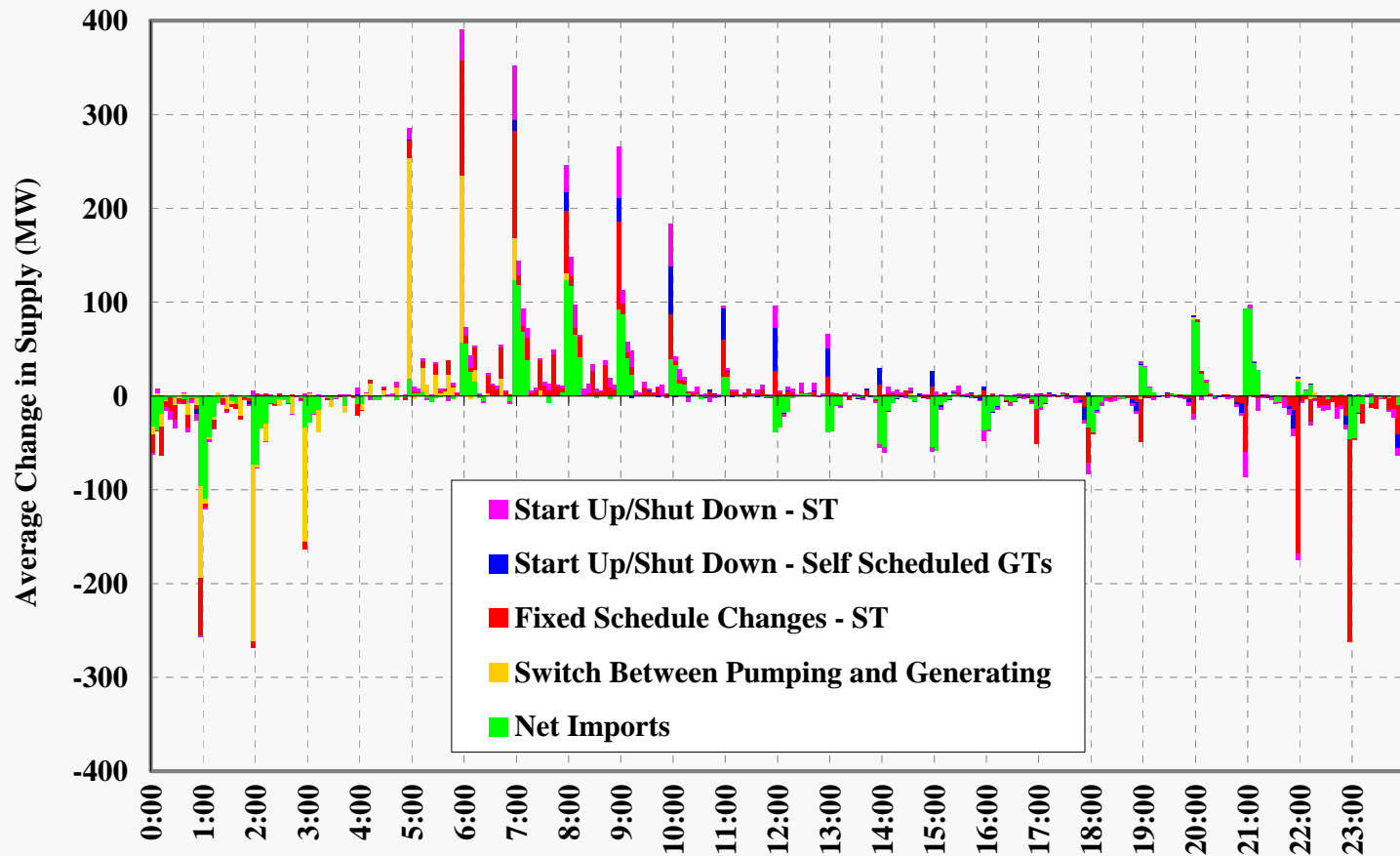


Five Minute Pricing by Time of Day [147] Load-Weighted System Average LBMP, June to August 2008



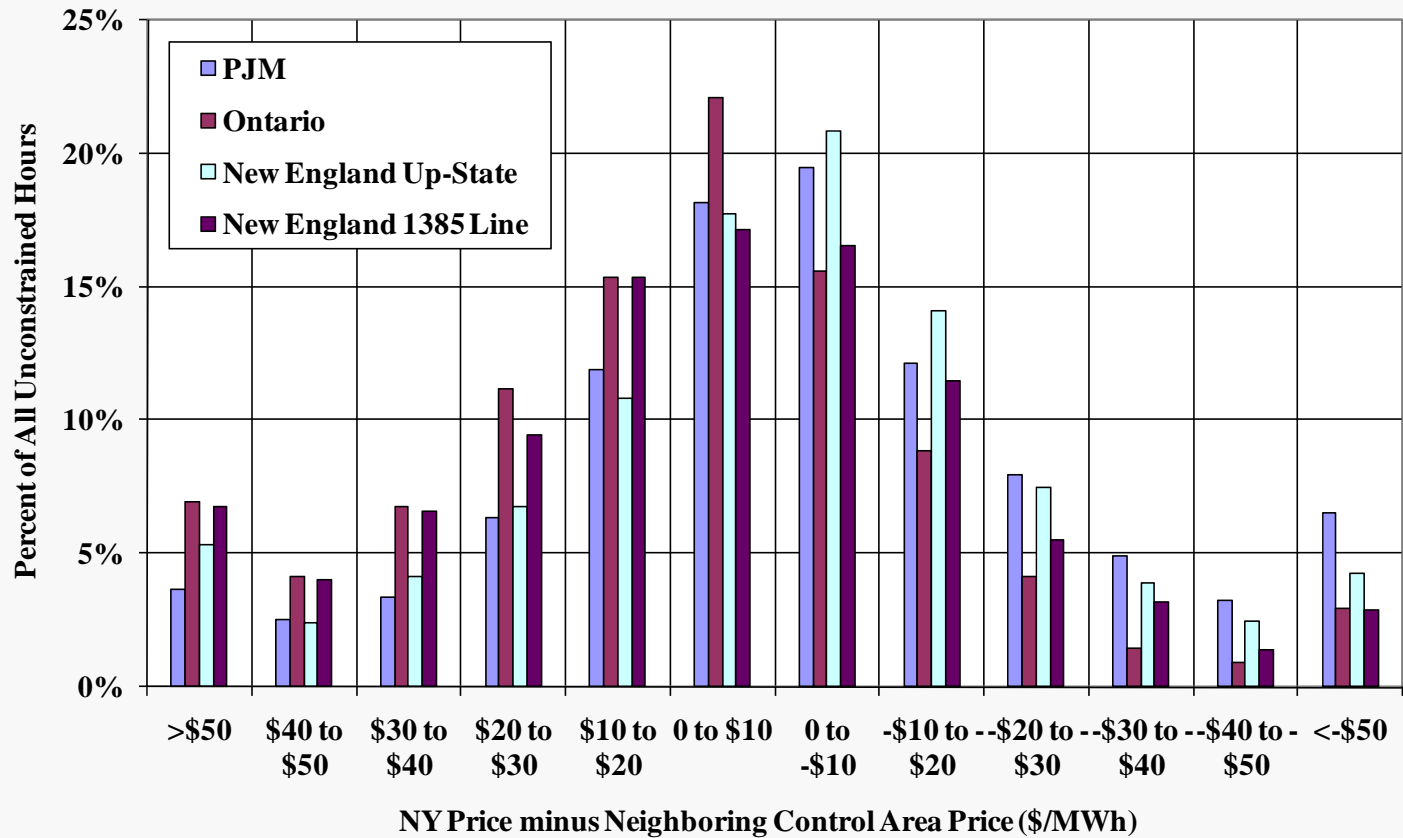


Factors Contributing to Real-Time Price Volatility June to August 2008 [148]





Price Convergence Between NY and Adjacent ISO Markets Unconstrained Hours in Real-Time Market, 2008 [58]



Note: The Neptune and Cross Sound Cable proxy busses are omitted because a separate system is used to allocate transmission reservations on them.

Estimated Benefits of Coordinated Interface Scheduling Up-state Interface with ISO-New England, 2006 – 2007 [65]

	2006	2007
Estimated Production Cost Net Savings (in Millions)	\$17	\$21
Estimated Consumer Net Savings (in Millions):		
New York Customers	\$59	\$177
New England Customers	\$61	\$22
Total for New York and New England Customers	\$120	\$199
During Reserve Shortage Hours	\$16	\$75



Executive Summary

Market Performance during Shortage Conditions

- High prices that occur when resources are insufficient to meet the system's demands contribute to efficient long-term price signals. The report evaluates the market results during three types shortages:
- *Operating reserve shortages.* The market produced reasonable shortage prices during most reserve shortages in 2008.
 - ✓ In virtually all of the instances when the market posted shortage prices, the system was physically in shortage.
 - ✓ However, some of the instances of physical shortages of eastern 10-minute reserves were not accompanied by corresponding shortage prices.
 - ✓ In March 2009, the NYISO implemented an enhancement that should reduce such instances.
- *Unresolved transmission constraints.* When constraints cannot be resolved by the market, prices are now set more efficiently due to the introduction of "Transmission Shortage Pricing" in June 2007.
- *Activation of Emergency Demand Response.* Due to the mild summer weather in 2008, there were no instances when these resources were activated.



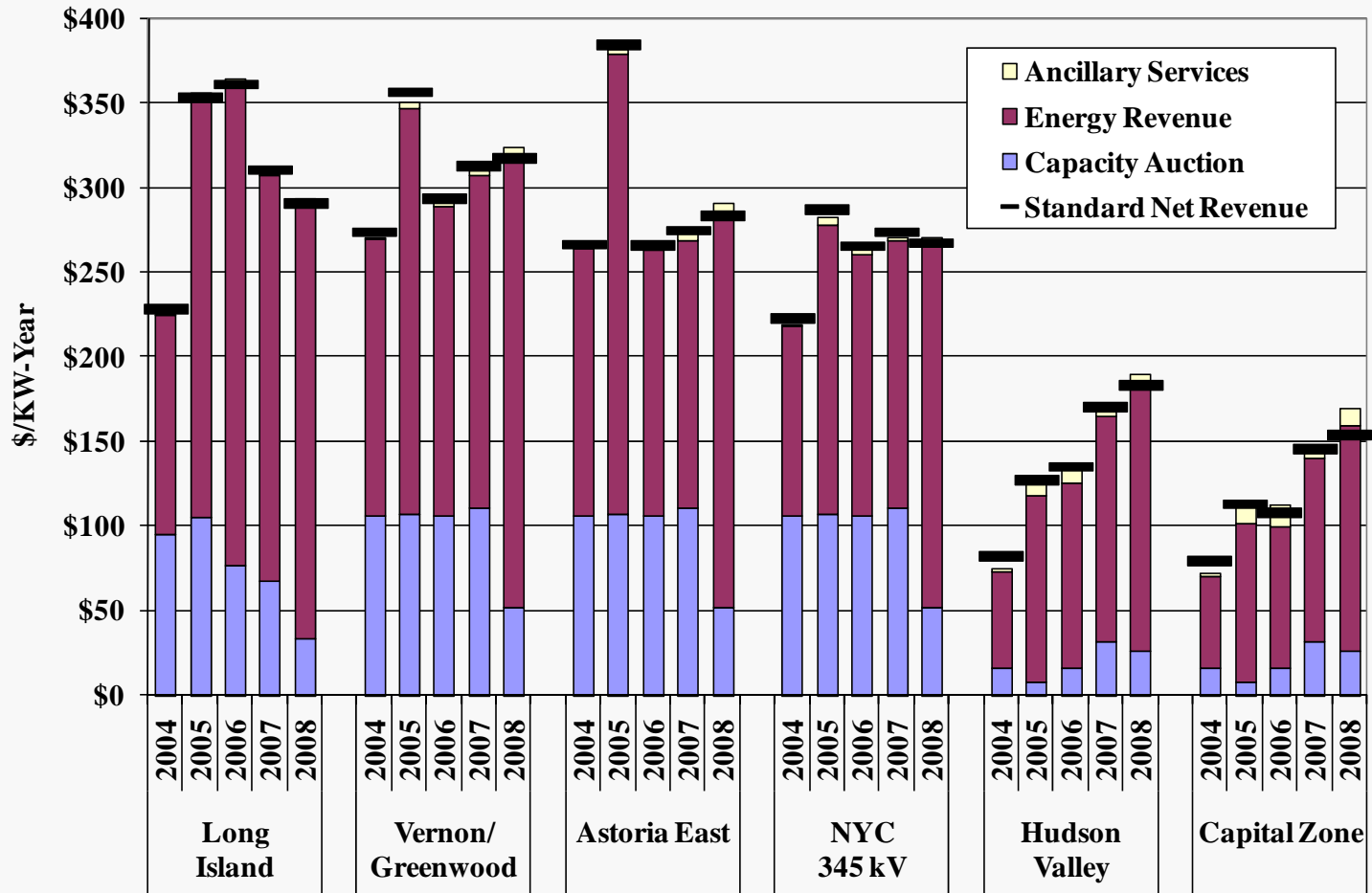
Executive Summary

Long-Term Economic Signals

- The report shows that prices in 2008 would not support investment in new peaking generation in most locations. This is consistent with short-term conditions because:
 - ✓ There is a surplus of generation in most areas; and
 - ✓ The summer weather was relatively mild in 2008.
- The report shows that market signals have generally shifted in favor of investment in baseload and intermediate resources. Although such resources are more costly to build, they produce electricity at lower cost.
 - ✓ Over time, the markets provide efficient incentives to invest in a diverse array of generating resources, demand response resources, and transmission.
 - ✓ Currently, market conditions appear more favorable for investment in combined-cycle generation (which have constituted most of the recent entry) than in gas-fired peaking generation.
 - ✓ Depending on the entry costs for a CC, it may be economic to build a CC in some areas under the current market conditions.

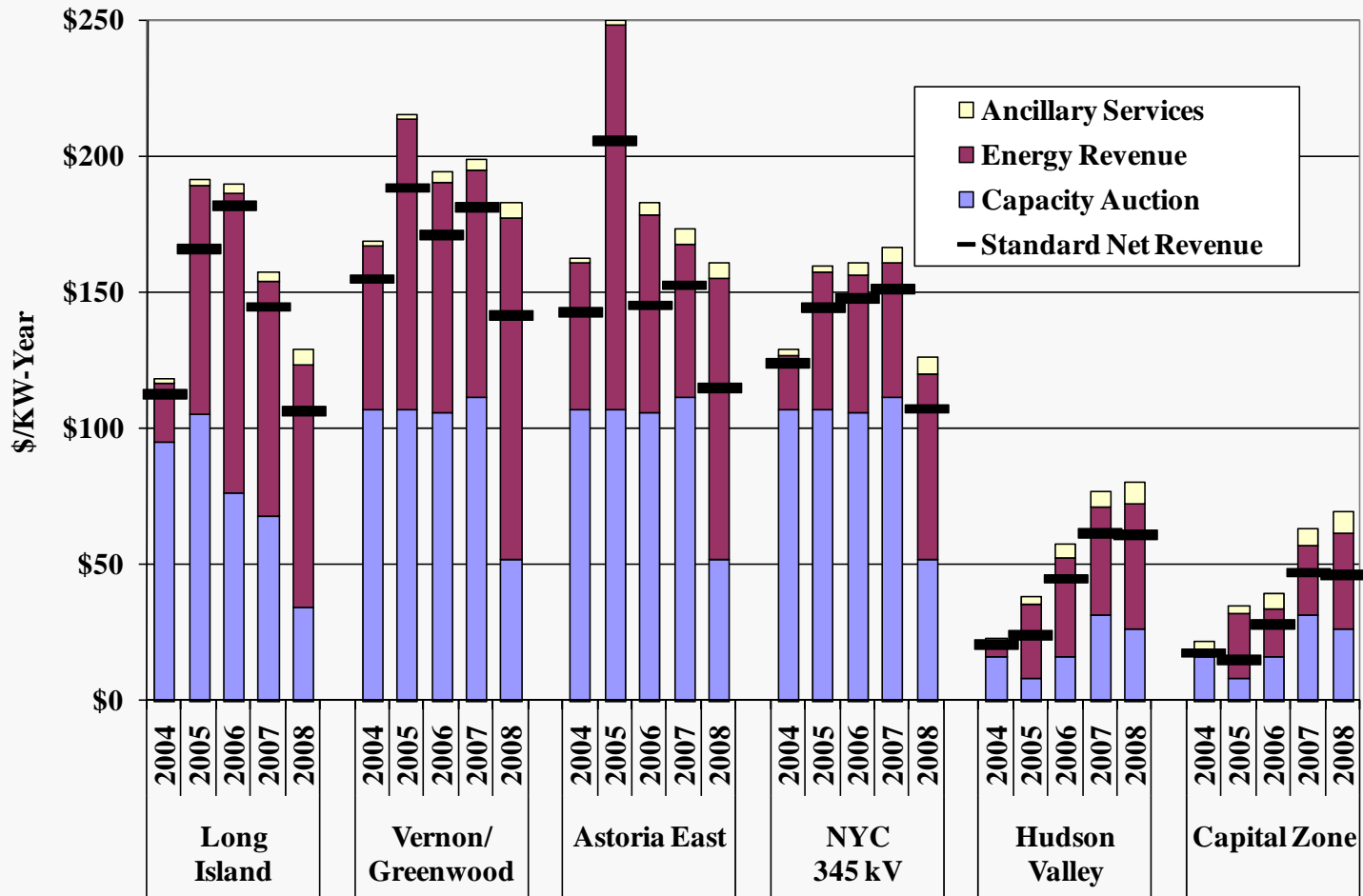


Enhanced Net Revenue Analysis Gas Combined-Cycle Unit, 2004 – 2008 [42]





Enhanced Net Revenue Analysis Gas Combustion Turbine, 2004 – 2008 [43]





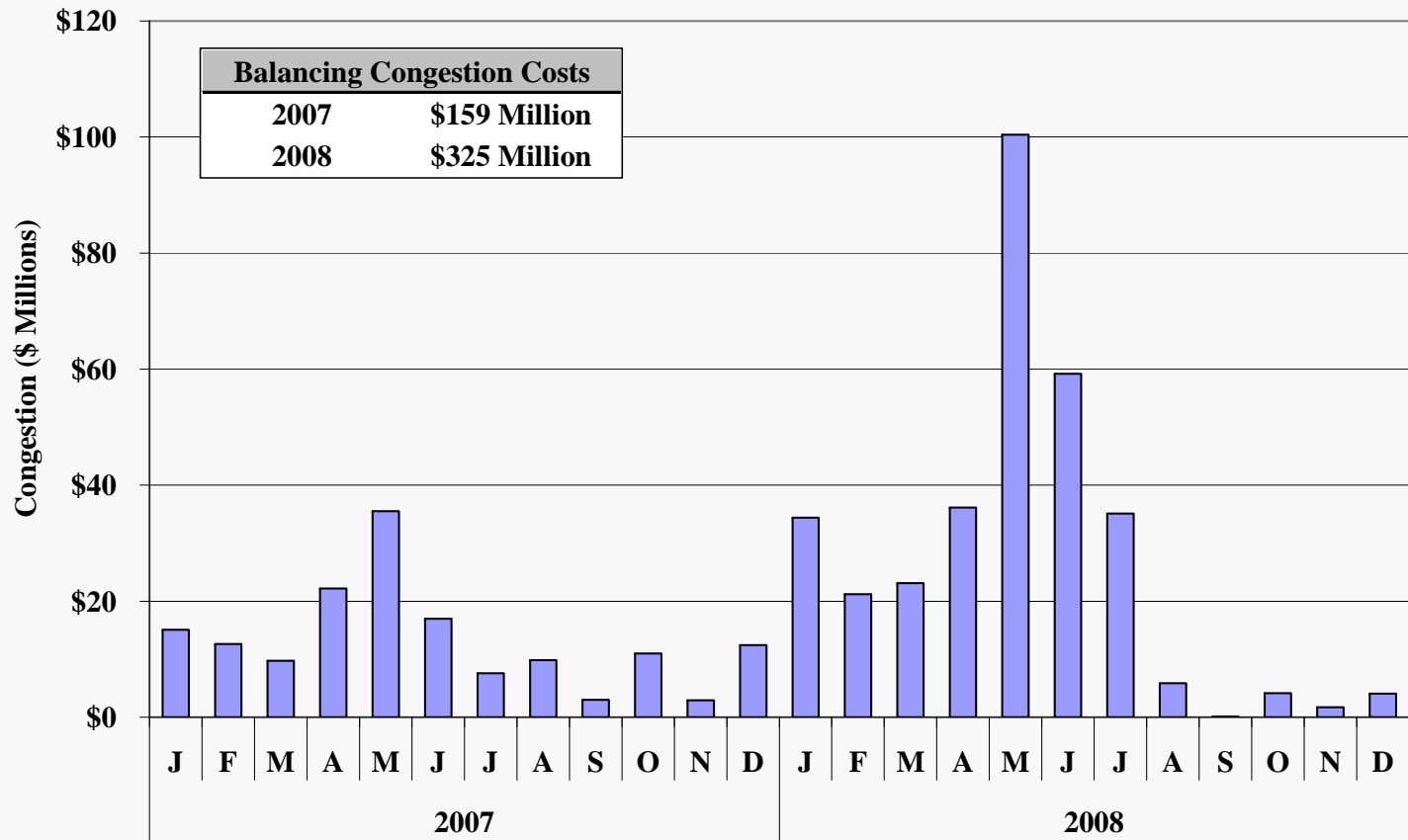
Executive Summary

Schedule 1 Uplift Charges

- Total Schedule 1 uplift charges increased from \$367 million in 2007 to \$599 million in 2008. The increase was primarily due to higher guarantee payments to generators and higher balancing congestion residual charges.
- Guarantee payments to generators increased \$90 million from 2007 to 2008.
 - ✓ This was primarily due to the increased fuel prices in the first half of 2008.
 - ✓ The majority of these payments are associated with generators that are committed for local reliability.
 - In February 2009, the NYISO made an enhancement to the DAM software which should reduce the uplift that results from these commitments.
- Balancing congestion residuals increased \$166 million from 2007 to 2008. The increase was primarily attributable to:
 - ✓ Increased fuel prices which increased congestion costs generally.
 - ✓ The effects of circuitous transaction scheduling around Lake Erie.
 - In July 2008, the NYISO filed to preclude these schedules, leading to a dramatic decline in balancing market congestion residuals.

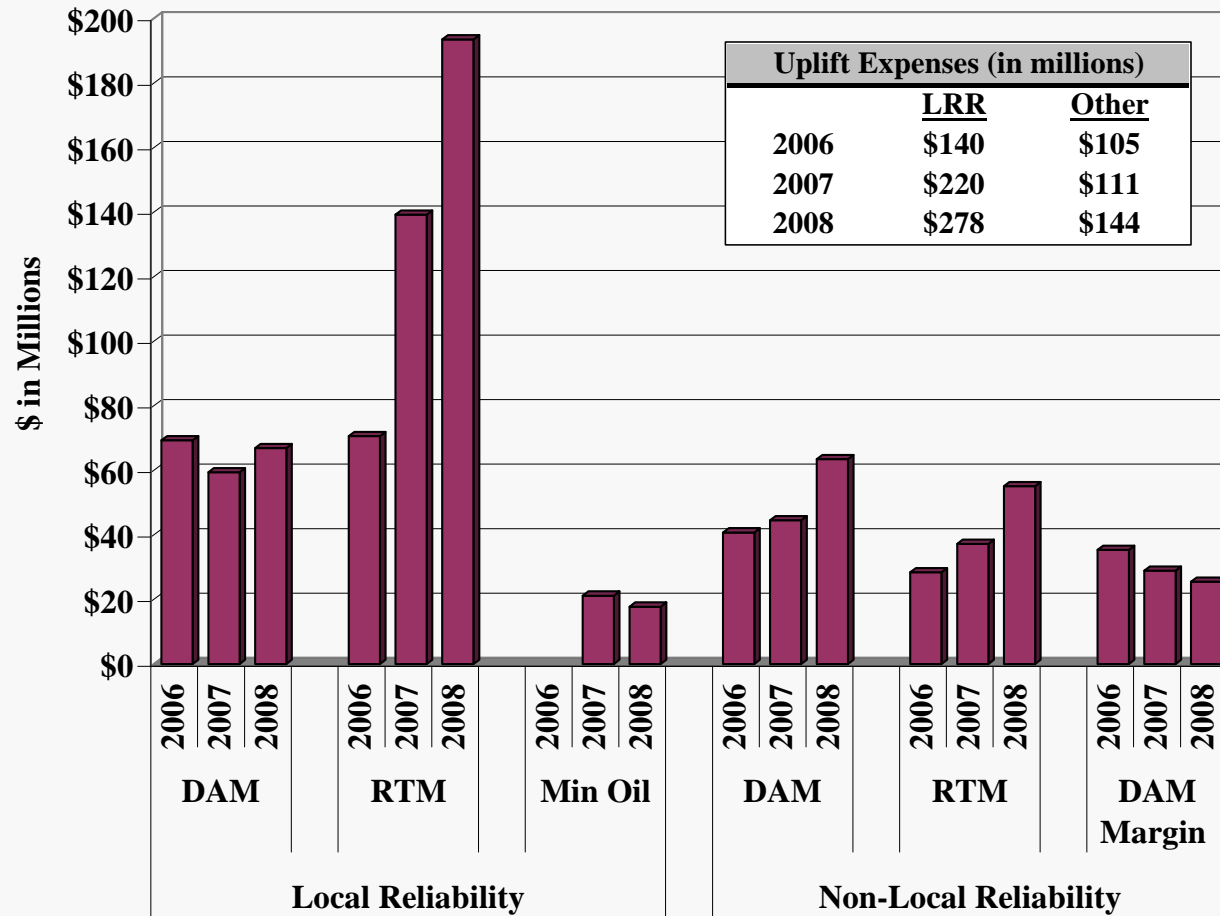


Balancing Congestion Revenue Shortfalls 2007 – 2008 [120]





Uplift Expenses from Guarantee Payments 2006 to 2008 [164]





Executive Summary: Recommendations

- 1. We recommend the NYISO consider defining a new capacity zone or zones in eastern New York. To the extent that capacity is deemed undeliverable from western New York to locations in eastern New York, new zones would:***
 - ✓ Allow consumers in the rest of New York to benefit from lower capacity costs and increased reliability that western resources and capacity imports provide;
 - ✓ Ensure loads in eastern New York only purchase capacity that is deliverable to those locations and provide necessary price signals to invest in new generation, transmission, or demand response resources in those areas when needed.
- 2. We recommend NYISO continue its work with neighboring control areas to better utilize the transfer capability between regions, ideally by directly coordinating the physical interchange and management of congestion.***
- 3. We recommend NYISO evaluate factors that contribute to real-time price volatility, including assumptions used in the real-time commitment model (“RTC”) and real-time dispatch model (“RTD”), or other market rules.***
 - ✓ A re-evaluation of the assumptions in RTD and RTC could improve the ramp management and lower price volatility, particularly at the top of the hour.



Executive Summary: Recommendations

4. *We recommend the NYISO consider a real-time demand response program to better align the incentives of retail customers with the needs of the system if retail rate reform is not anticipated soon.*
 - ✓ Retail rate reform is one means to give retail loads incentives to respond to prices. However, there are other ways the ISO may provide these incentives.
5. *We recommend that NYISO revisit the baseline method and testing procedures for SCRs to ensure they have the ability to respond when called in real-time.*
6. *We recommend NYISO modify two mitigation provisions that may limit competitive Day-Ahead 10-minute reserves offers, which should improve convergence of day-ahead and real-time ancillary services prices.*
7. *We recommend the offer limit for real-time import and exports be raised from $-\$1000/\text{MWh}$ to a level more consistent with the avoided costs of curtailment, which would limit balancing congestion shortfalls when they must be curtailed.*
8. *NYISO has a project underway to enable market participants to schedule virtual trades at a more disaggregated level.*
 - ✓ Currently, virtual trading is allowed at only the zonal level. This change is intended to improve price convergence in the New York City load pockets.



Executive Summary: Recent Enhancements

- 1. In February 2009, the NYISO incorporated commitments to satisfy New York City local reliability rules with the economic commitment in the day-ahead market software.***
 - ✓ This is expected to reduce the uplift charges that result from committing generation to satisfy the local reliability rules.
 - ✓ This is also expected to improve convergence between day-ahead and real-time prices in the New York City load pockets.
- 2. In March 2009, the NYISO modified the treatment of ramp limitations in the real-time market's pricing model for units that are not responding to dispatch signals.***
 - ✓ This is expected to improve the consistency of the pricing and physical dispatch passes of RTD, the efficiency of energy and ancillary services prices (particularly during shortages), and reduce uplift.
- 3. The NYISO has refined its procedures to improve the accuracy of the loop flow assumptions in the day-ahead and TCC markets.***