



Effects of Gas Derates on the NYISO Electrical Grid Winter 2003-'04

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Introduction

- ✓ For the past two winters, the NYISO has reviewed the impact of the gas market on the operation of the electrical grid.
- ✓ During periods of cold temperatures, as the gas delivery system reaches its design peak capacity, there are limited natural gas resources available to generators.
- ✓ In the past this has led to deratings by generators due to insufficient fuel.

Fuel Deratings

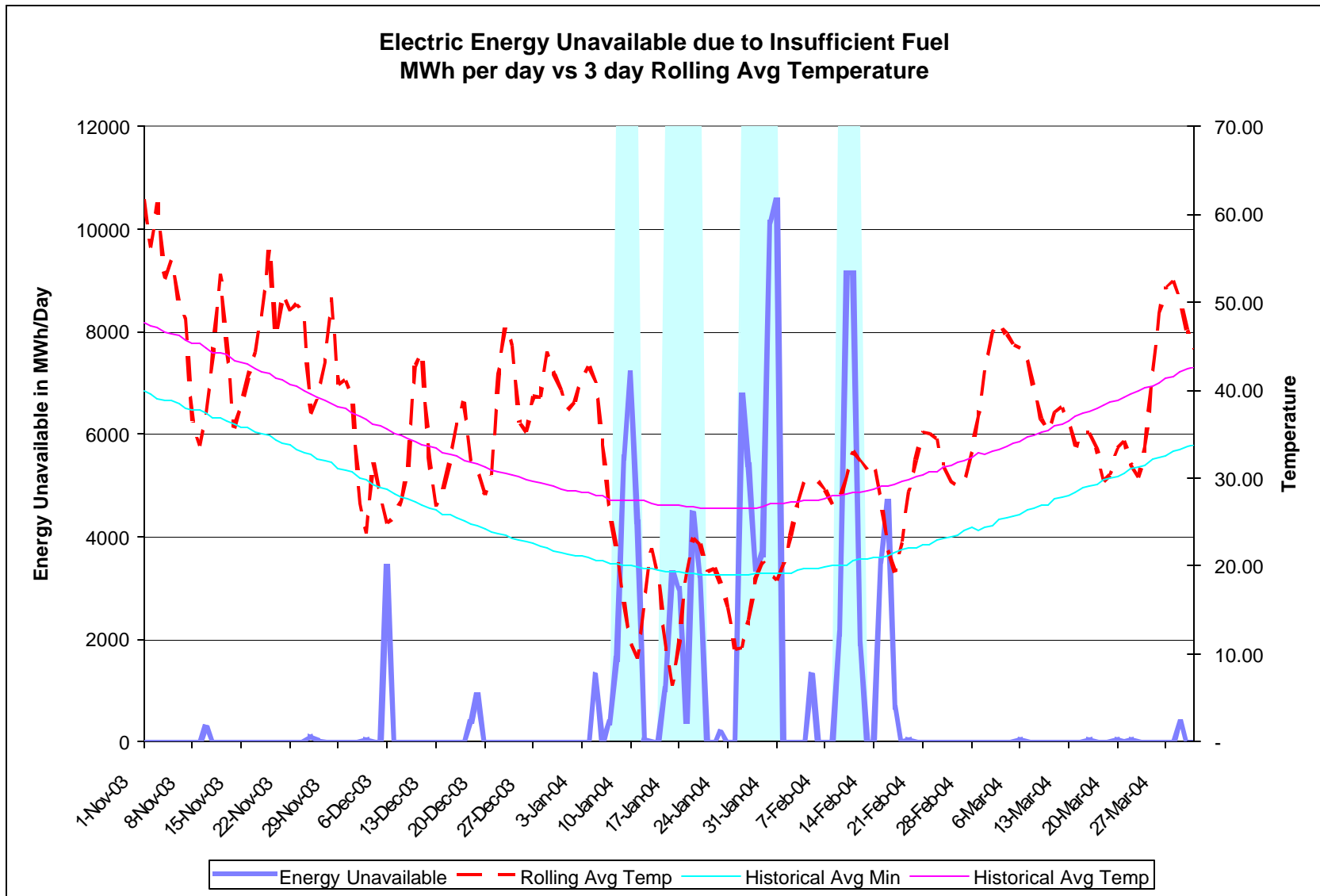
- ✓ While New York experienced extreme temperatures for a few days in January 2004, the most recent winter was warmer than the previous winter, measured in heating degree days.
- ✓ Historical or average heating degree days for NY is 4,799 for the period November through March.
- ✓ 2004 was 7.0% warmer than the previous year and 1.0% warmer than normal.

| | Gas Deratings (in Unit Hours) | NY Heating Degree Days |
|-------------|--|-----------------------------------|
| 2002 | 753 | 3,877 |
| 2003 | 1,636 | 5,102 |
| 2004 | 955 | 4,753 |

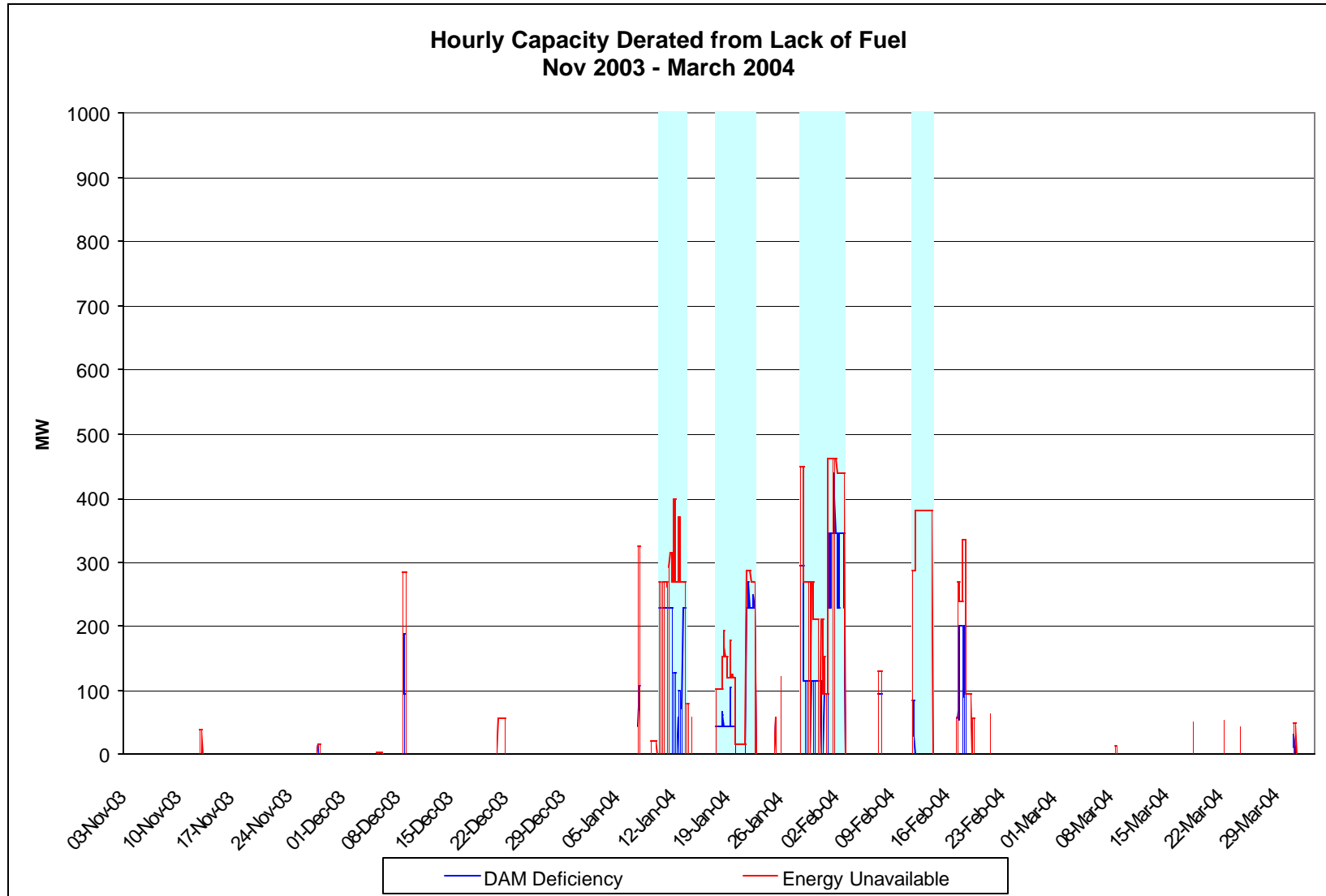
Fuel Deratings

- ✓ The total derated unit hours for the Winter 2003-'04 is estimated to be 955 hours.
- ✓ The largest hourly period of derates occurred on January 29 – 30, with 461 MWs of capacity unavailable. This compares to the previous year maximum of 981 MWs of capacity unavailable.
- ✓ The periods in which the highest number of deratings occurred are as follows:
 - January 8 – 11;
 - January 15 – 20;
 - January 26 – 31; and
 - February 9 – 12.

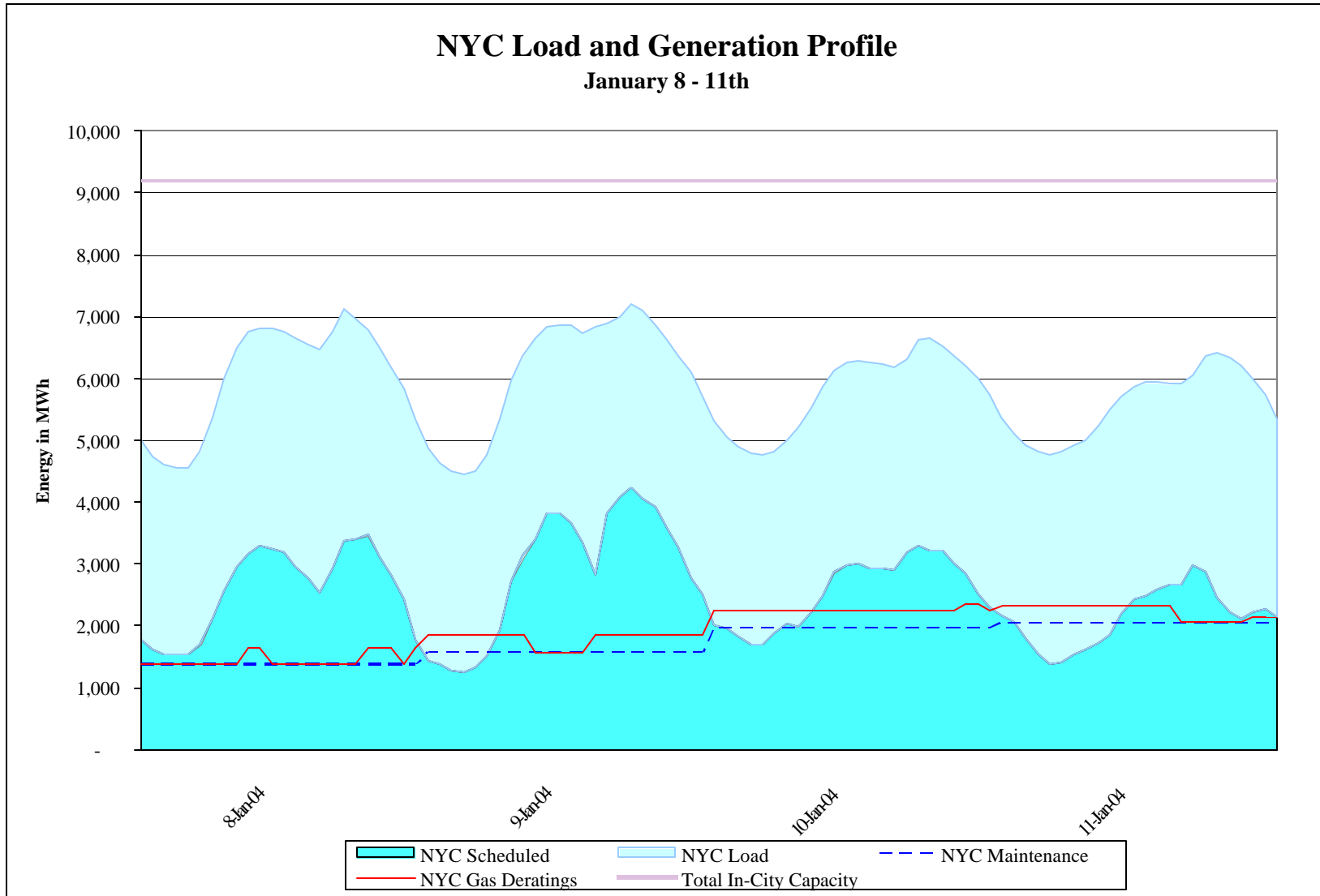
Fuel Deratings



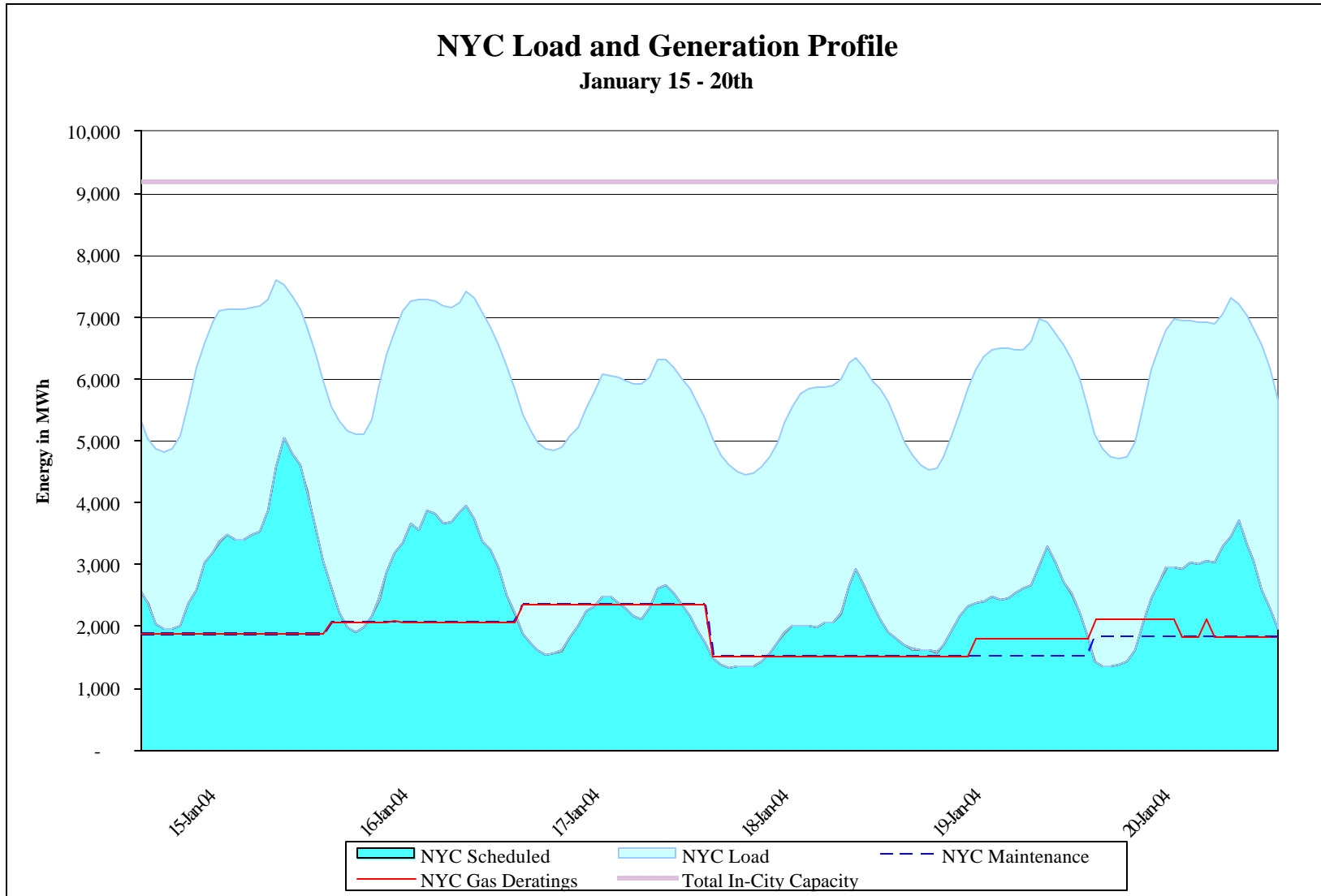
Fuel Deratings



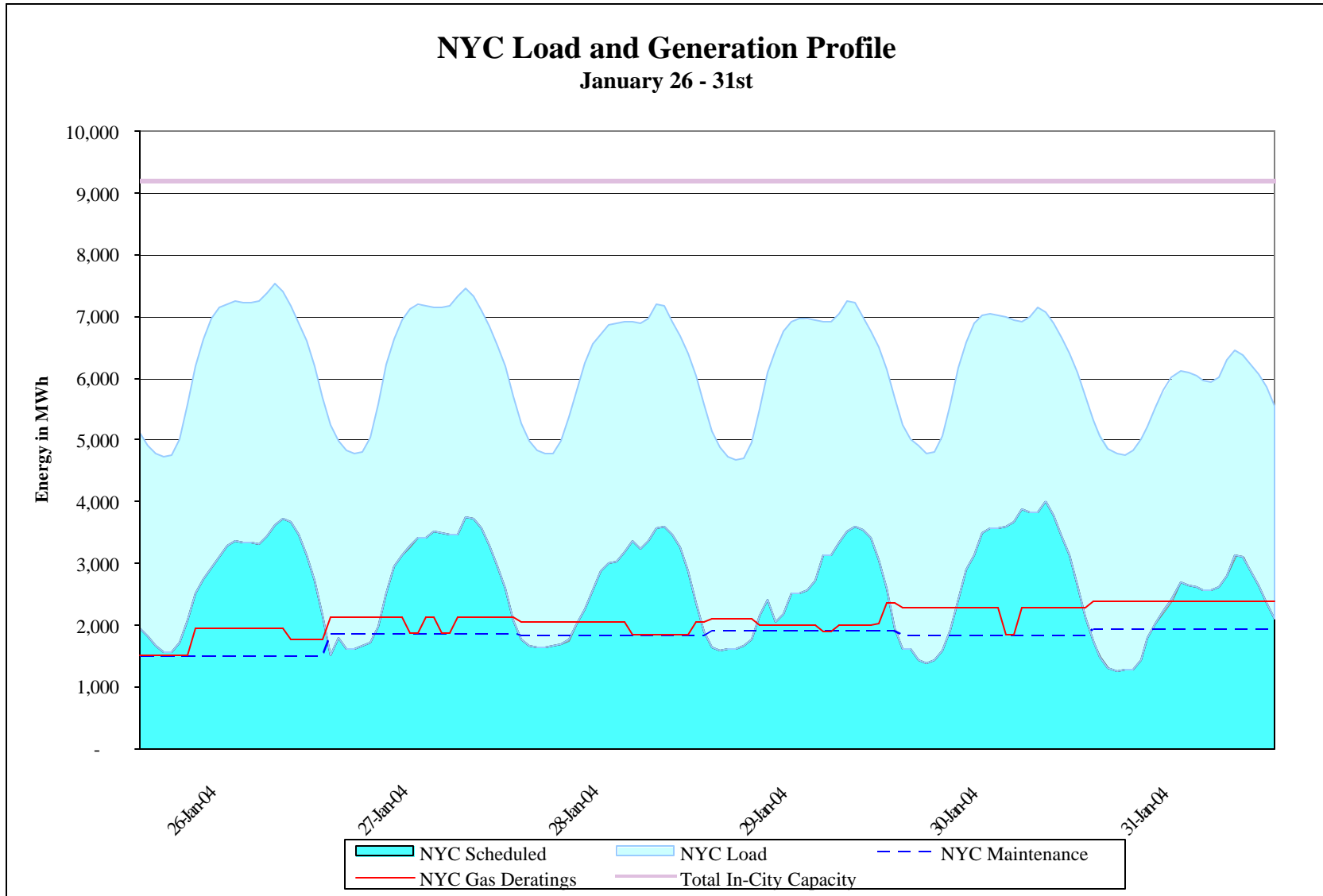
Fuel Deratings



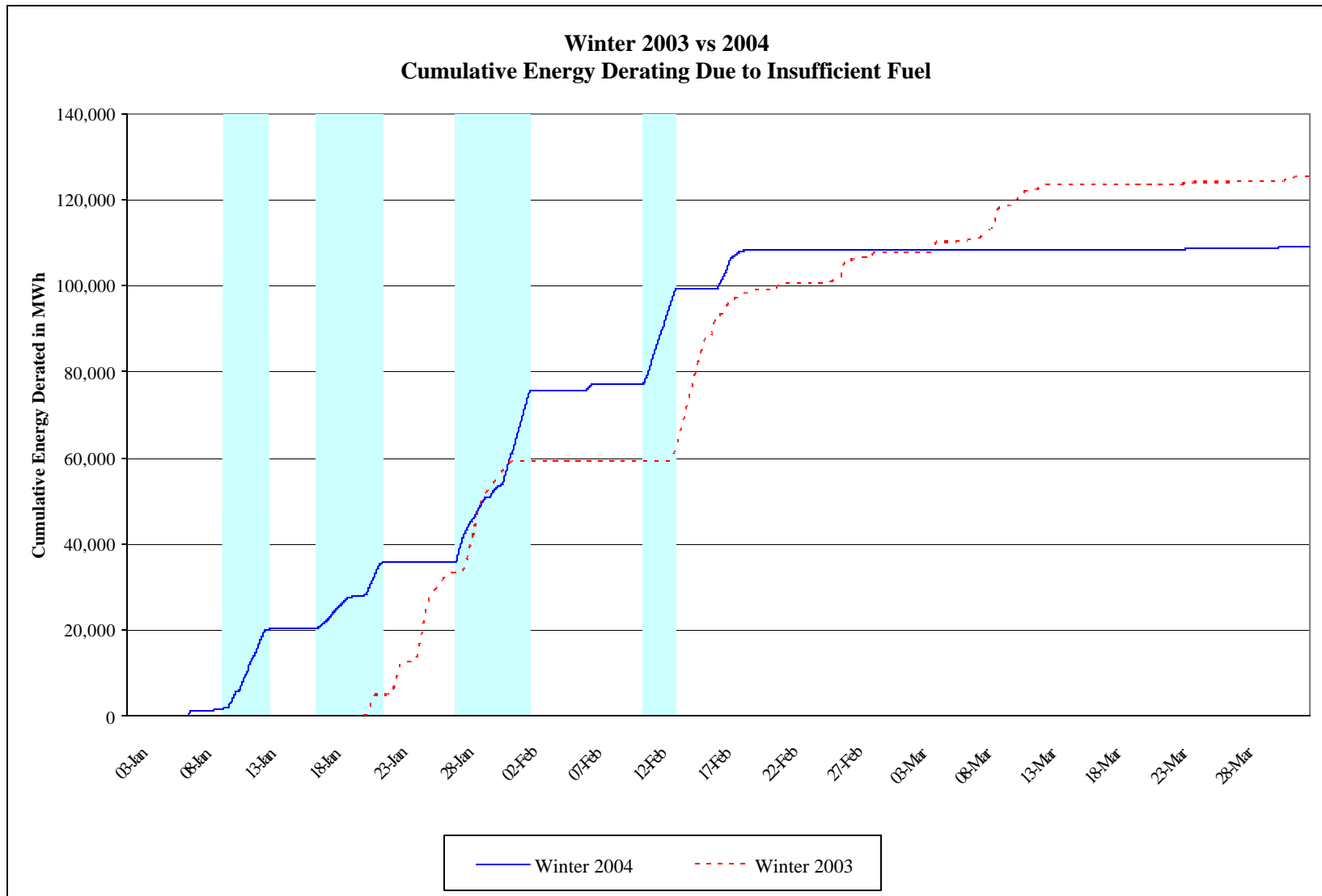
Fuel Deratings



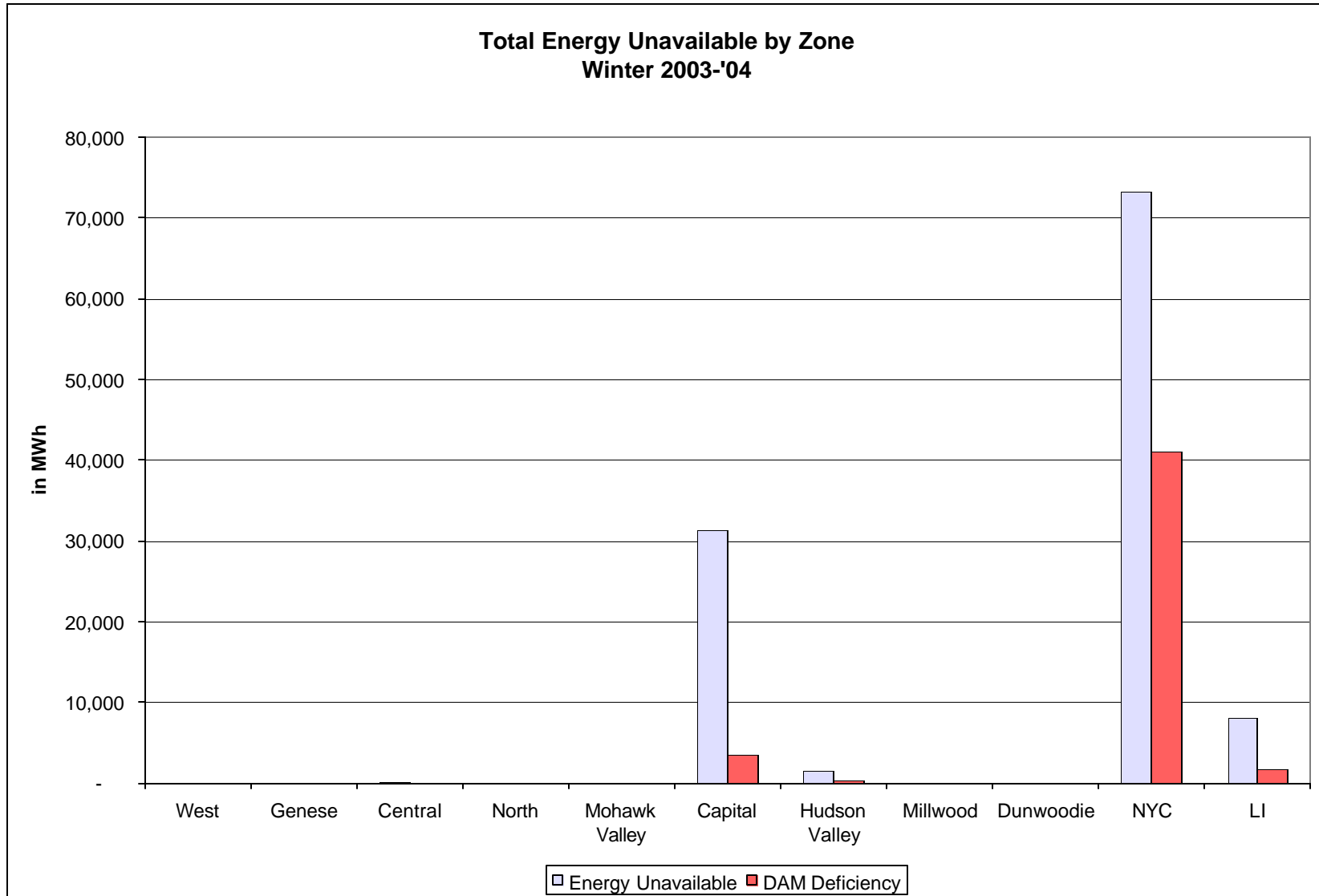
Fuel Deratings



Fuel Deratings



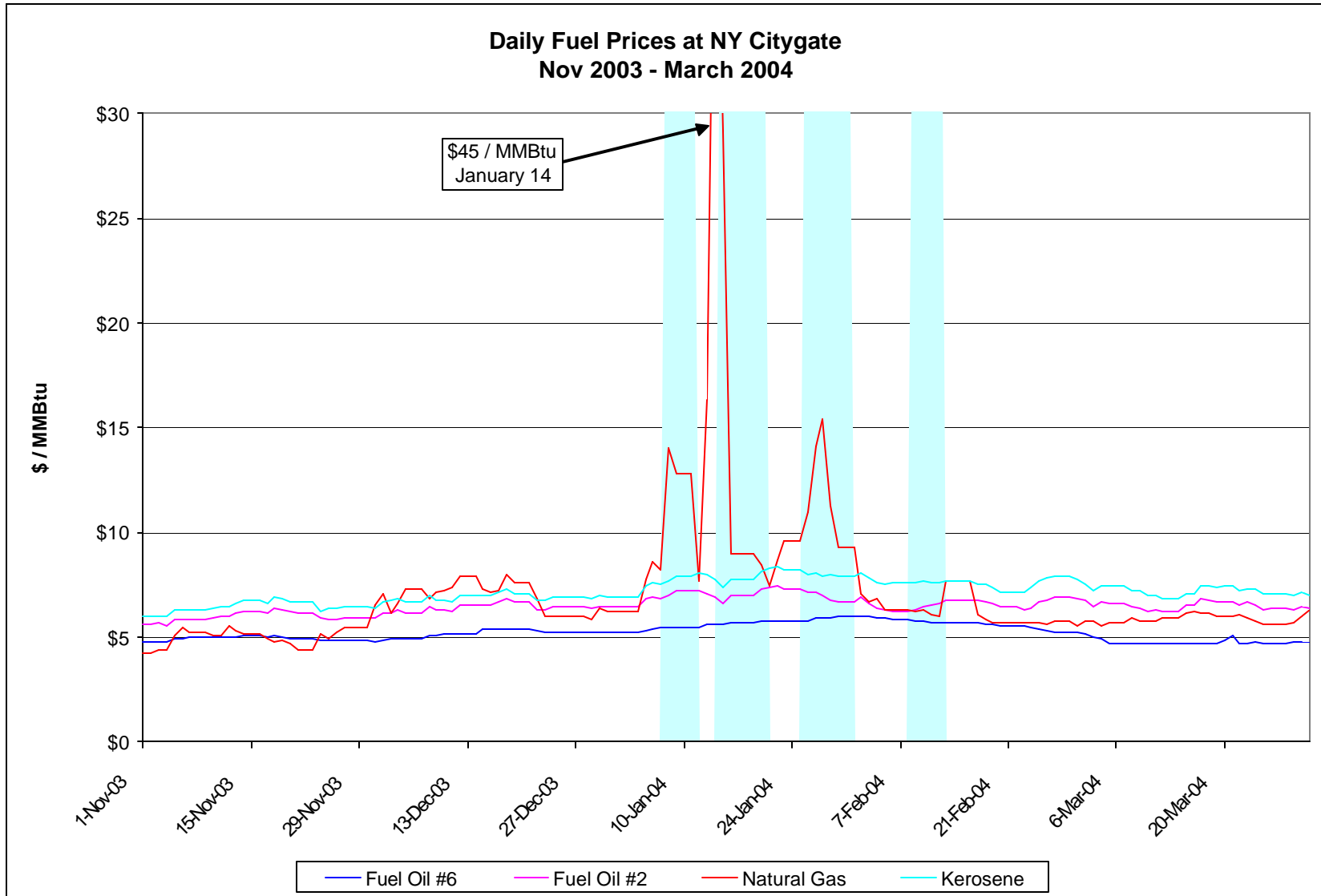
Fuel Deratings



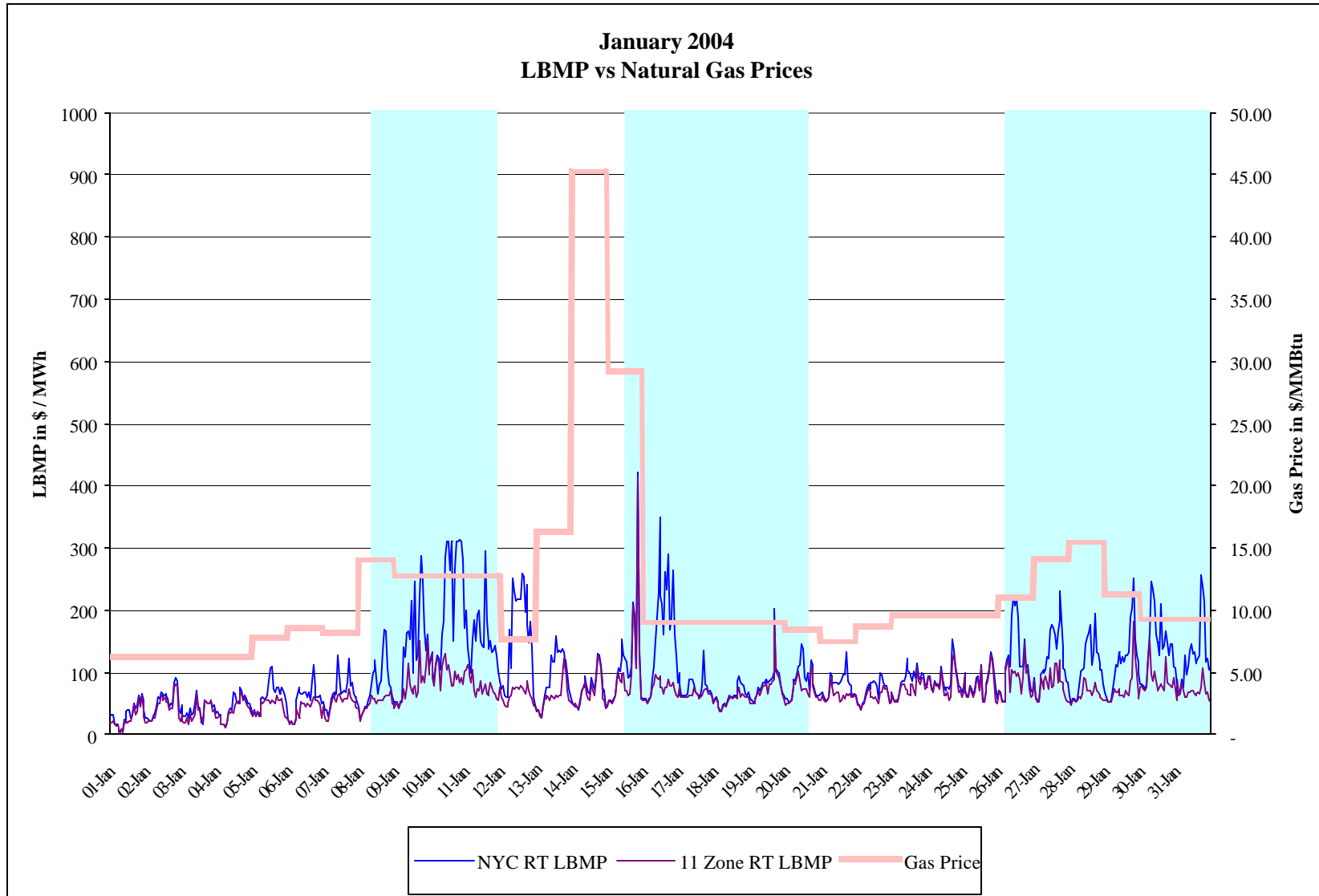
Fuel Markets

- ✓ Natural Gas prices remained very volatile during the winter season (similarly to last winter).
- ✓ Prices at the NY city-gate reached \$45 / MMBtu on January 14, 2004.
- ✓ Fuel Oil prices also increased during the winter months, as demand for heating increased, but not to the scarcity levels reflected by natural gas prices.
- ✓ Given the relative cost of natural gas to other fuels during the winter months, most dual fuel generators were running on fuel oil or kerosene.

Fuel Markets



Fuel Markets



Generators

- ✓ 39 different generating units were derated during the winter months of 2004 due to lack of fuel. Nearly 90% of the derates occurred at 6 units.
- ✓ Of the 39 derated units, 21 of the units were GTs that represent only 7.8% of the total derated capacity. Most of these units did not have day-ahead or hour ahead schedules at the time of their derating.
- ✓ Of particular concern is the large number of dual fueled units, 23 out of the 39 units, that were derated despite possessing alternative fuel capability.

Impacts on Electrical Grid

- ✓ NYISO did not face potential shortages of generation similar to ISO-NE during the mid-January cold spell.
- ✓ While there were reports that water traffic was curtailed by the U.S. Coast Guard in NY City harbor due to high winds and cold temperatures, limiting deliveries of fuel oil, this did not seem to impact the normal operation of the electrical grid.

Conclusion

- ✓ While the NYISO experienced some deratings due to lack of fuel, these events did not significantly impact the reliability of the electric grid.
- ✓ The following observations were significant in reaching this conclusion:
 - *The generation mix in NYISO is more diverse than ISO-NE, with a greater number of dual fuel generators;*
 - *Most generators serving NYISO were likely burning fuel oil during periods of high natural gas prices; and*
 - *With the exception of a week in January 2004, the 2003-'04 winter was more mild than the previous winter.*