



Ontario Energy Board

Commission de l'énergie de l'Ontario

**Market Surveillance Panel's
11th Monitoring Report
Presentation to the Stakeholder Advisory
Committee**

February 6, 2008

Agenda

- Recommendations
- Policy Issue – Efficiency of Public Agency Contracts
- Not discussed - Summary of Summer 2007 – Key Findings:
 - Price indicators
 - Demand indicators
 - Supply indicators
 - Hourly market uplifts



Recommendations

- Panel has made 13 recommendations in the report.
- Seven of thirteen are directed at the IESO with the purpose of enhancing efficiency or reducing uplifts.
- Two are efficiency issues directed at the IESO and Hydro One relating to the Michigan phase angle regulators.
- One is an efficiency issue directed at Hydro One for completion of the Queenston flow west transmission expansion as soon as practical.



Recommendations cont'd

- Two are issues of transparency directed at the Ontario Power Authority (OPA) and IESO for the release of more uplift payment information to allow participant to make better informed consumption decisions.
- One is an efficiency issue directed at the OPA regarding structuring of electricity supply contracts.



Recommendations directed at the IESO to enhance efficiency

Recommendation 1-1 (Chapter 1 Section 2.4.3)

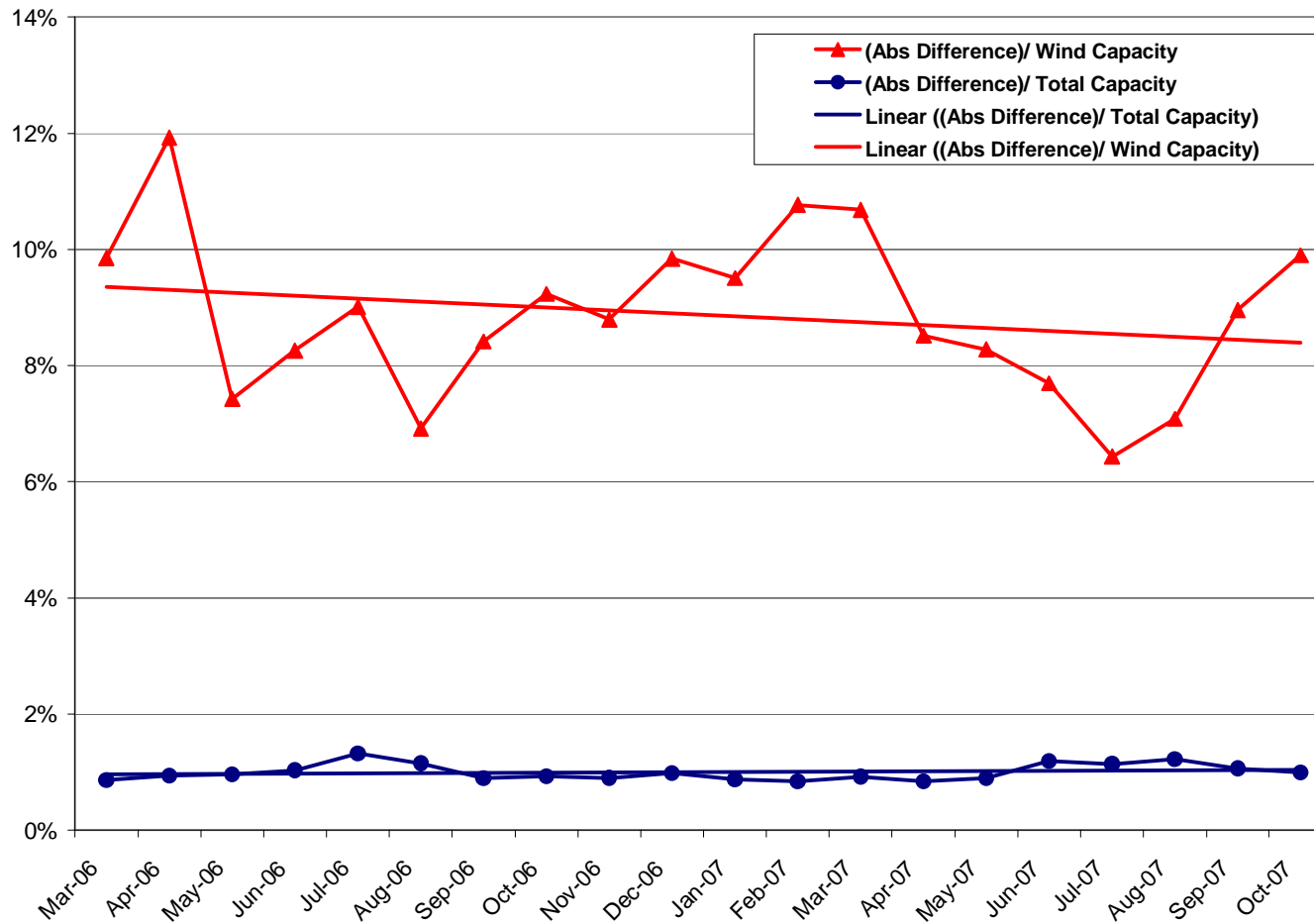
- *The Panel encourages the IESO to continue to review the forecasting process with wind generators and determine methods to reduce forecast errors. Such generators should have incentives (positive or negative) to encourage accurate forecasting.*

Recommendation 3-7 (Chapter 3 Section 4.4.3)

- *To the extent possible in its stakeholder consultation on embedded generation, the IESO should consider opportunities to reduce inefficiency through the development of the capability for accurate forecasting of embedded generation production, which may require the provision of real-time production and related information (e.g. outages).*



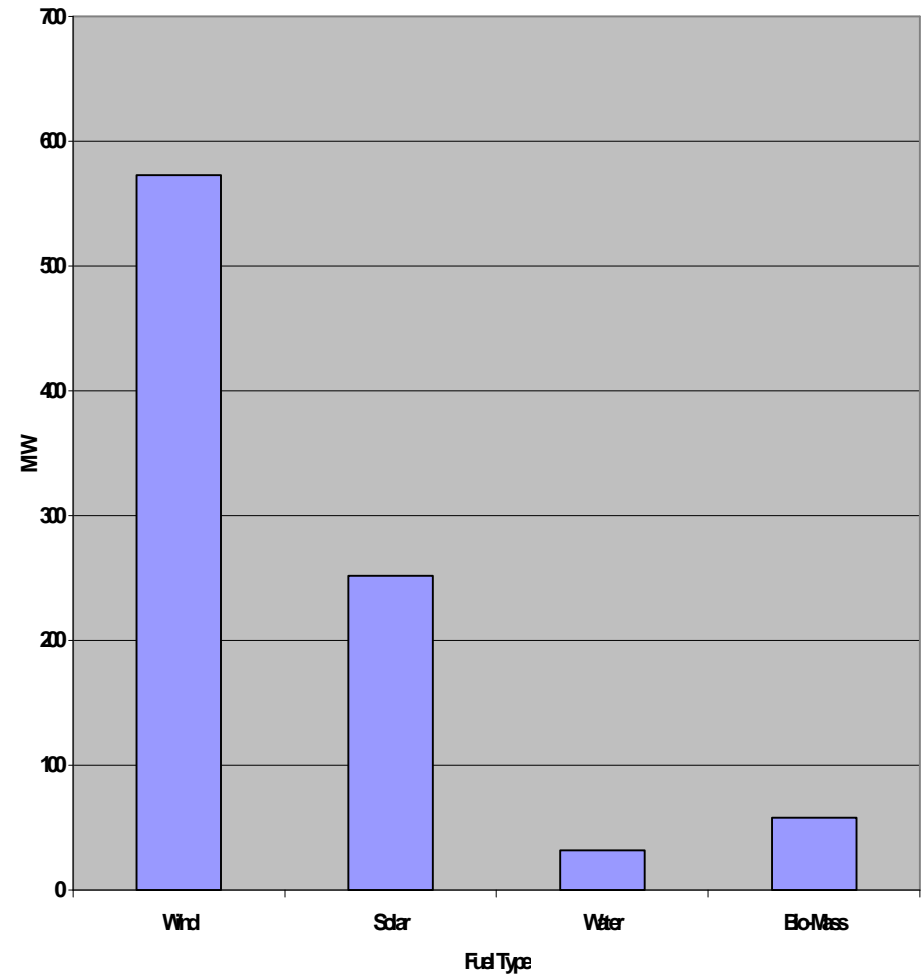
Mean absolute wind error versus demand forecast error one-hour ahead



Embedded Generation – RESOP contracts signed in 2007 Dec 2007 OPA Progress Report

By the end of 2007, 917 MW of RESOP contracts were executed by OPA

These standard offer generators would not be transparent to the IESO



Recommendations directed at the IESO to enhance efficiency

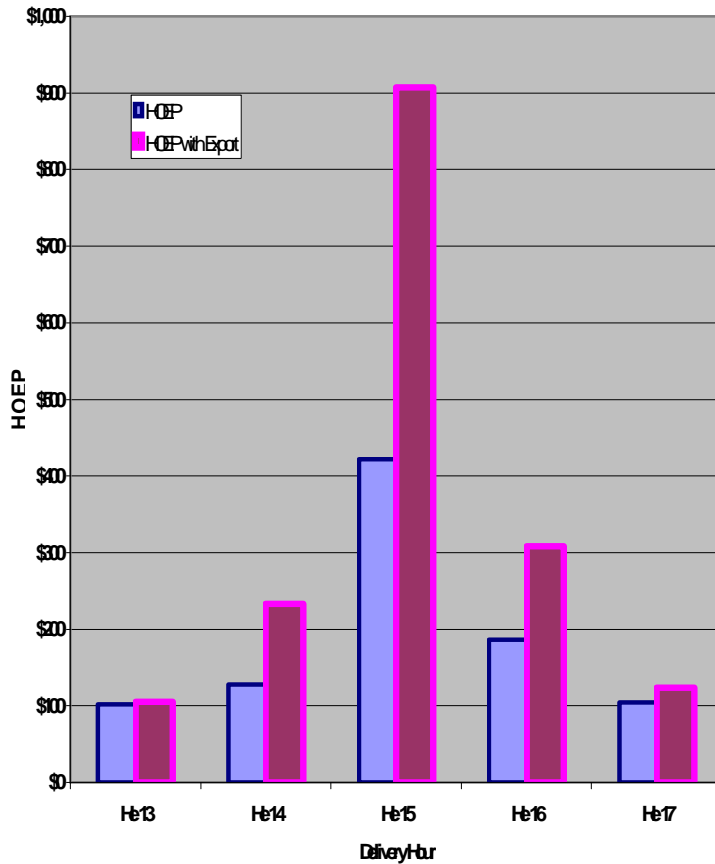
Recommendation 2-1 (Chapter 2 Section 2.1.2.3)

- *Export curtailment due to ‘adequacy’ has an effect of suppressing the market price during times of serious scarcity since the curtailed amount is removed from the market schedule, thus distorting the market price signal. The Panel recommends that the IESO not revoke the curtailed amount due to ‘adequacy’ from the market schedule.*
- It should be noted that in cases where exports need to be curtailed due to internal transmission issues, these MW’s are left in the market schedule and presently **do** impact the HOEP.

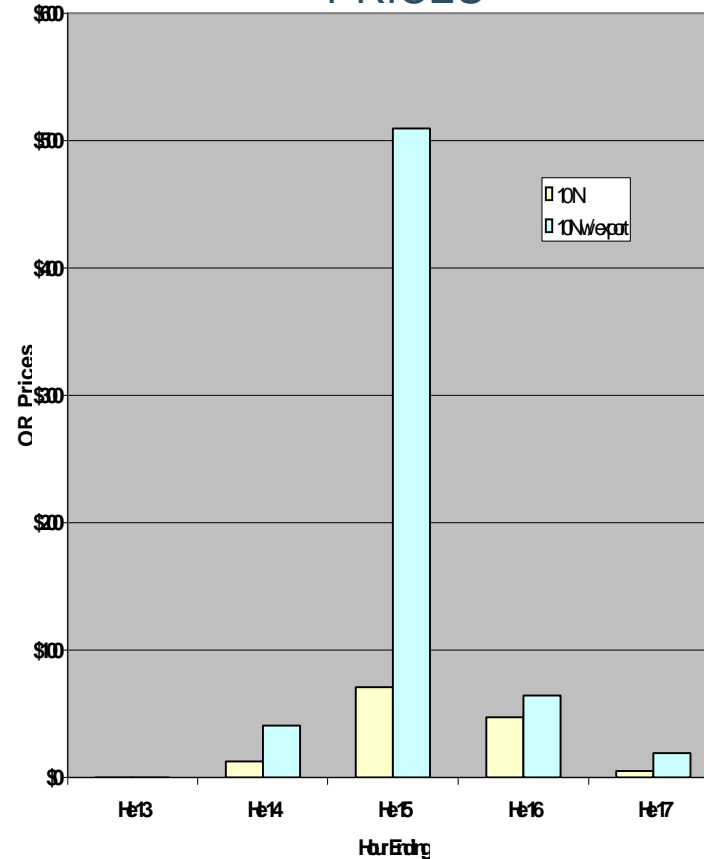


The price impact of export curtailment, June 12, 2007, HE 13 to HE 17 (\$/MWh)

IMPACT ON HOEP



IMPACT ON OR PRICES



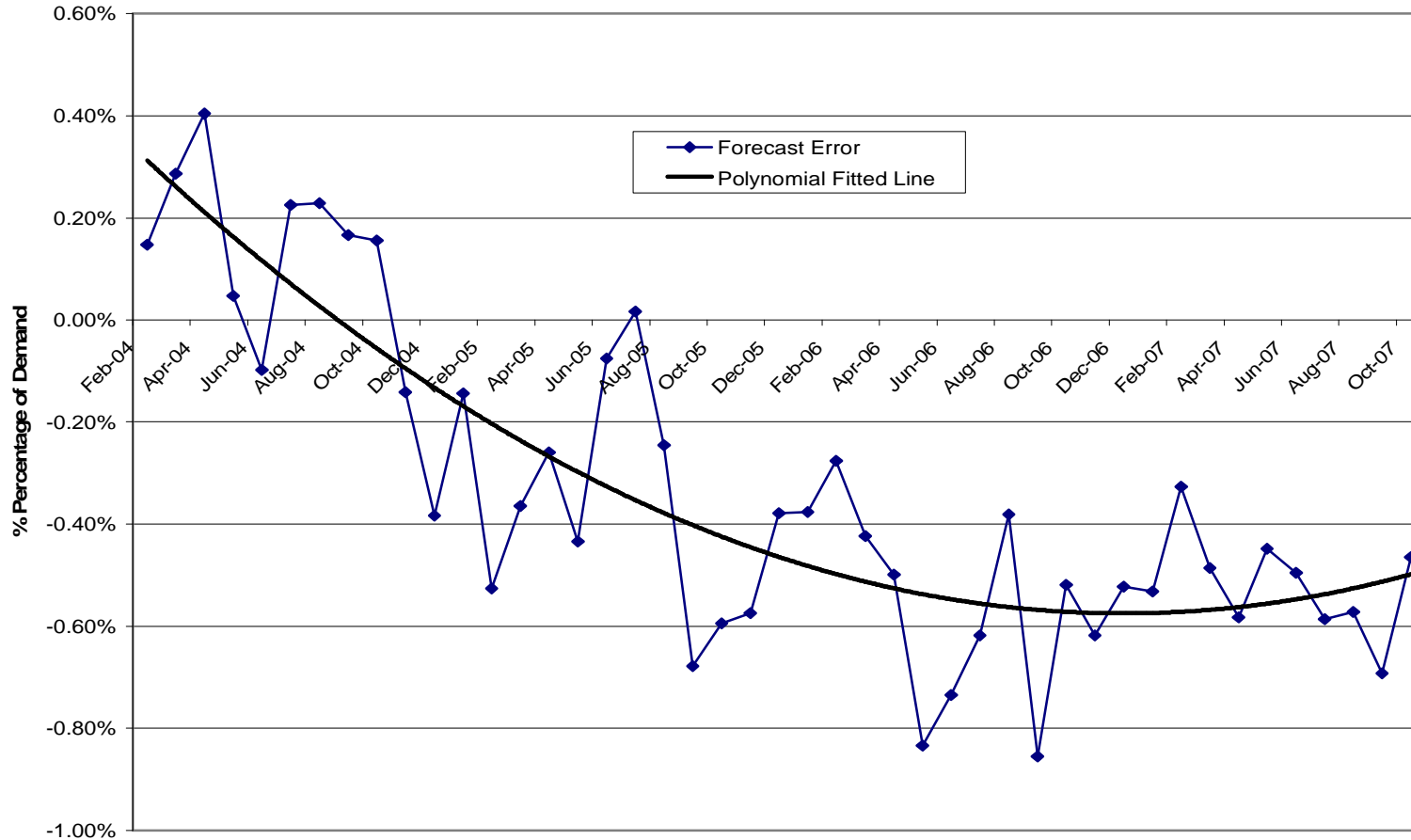
Recommendations directed at the IESO to enhance efficiency

Recommendation 3-1 (Chapter 3 Section 2.3)

- *Consistent with prior recommendations directed at improving the IESO load predictor, whose algorithm imputes changes in non-dispatchable load that can induce consumption inefficiency and forecast errors, the Panel recommends that the IESO review its load predictor methodology to determine if it is a source of persistent under-forecasting of demand.*



Constrained demand forecast error February 2004 – October 2007



Recommendations directed at the IESO to enhance efficiency

Recommendation 3-3 (Chapter 3 Section 3.1)

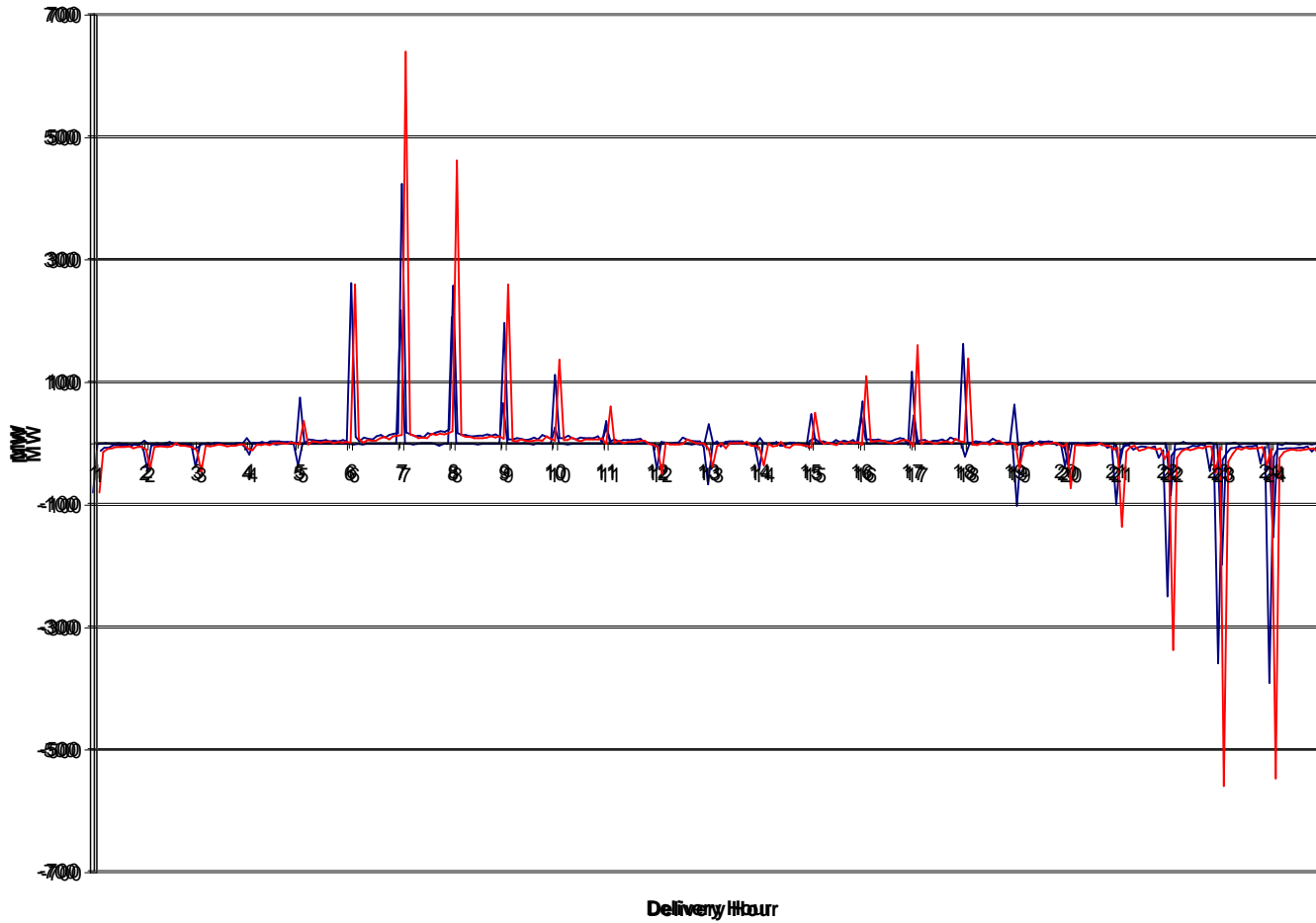
- *The MSP recommends the IESO begin investigation of a 15 minute dispatch algorithm to enhance the efficiency of the market.*
- A large portion of dispatch issues occur in the first few intervals of the hour. These abrupt changes are causing efficiency problems.

Efficiency opportunities include:

- Better co-ordination with other markets
- Less ramping of fossil generation
- Better ability to co-ordinate hydroelectric and fossil dispatch

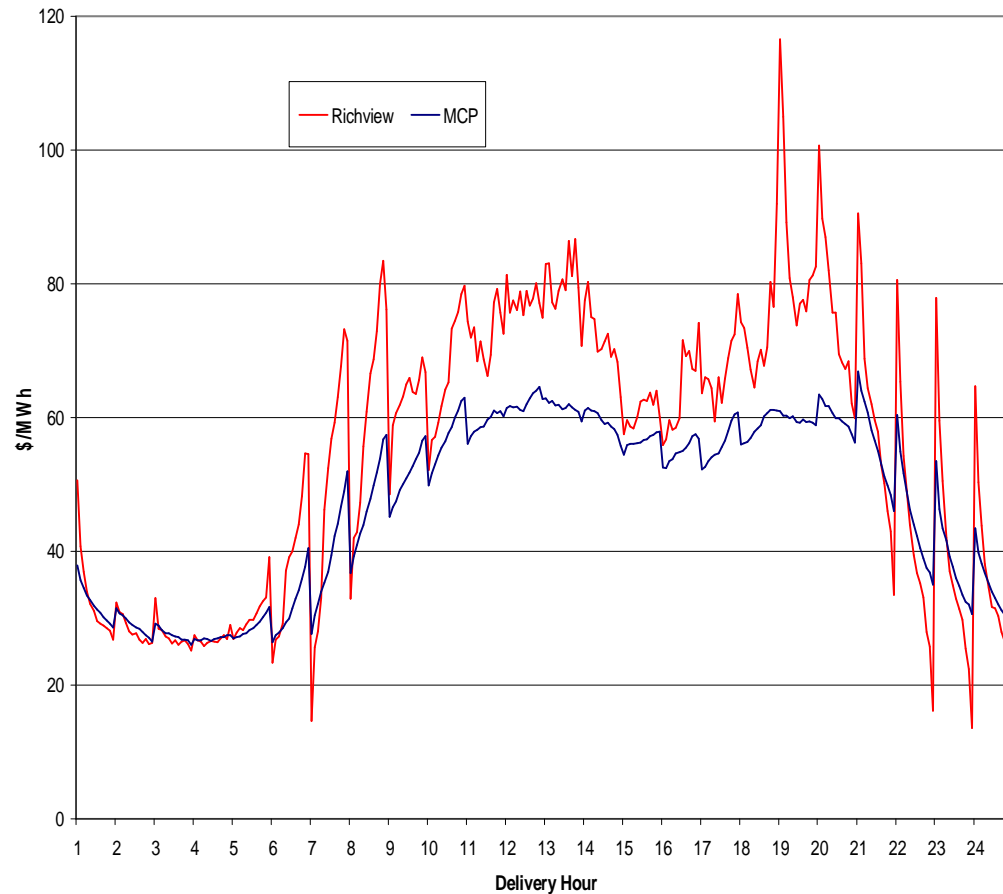


Imports net change hydro plus imports



Average MCP and Richview shadow price by interval, November 2006 - October 2007

- Abrupt changes in net import and Hydroelectric output can be observed causing sudden interval to interval price changes in both the Richview and Uniform Prices



Recommendations directed at the IESO to reduce uplifts

Recommendation 3-4 (Chapter 3 Section 4.1)

- *The IESO should initiate a rule change to allow the recovery of self-induced congestion management settlement credit (CMSC) payments which are made to generators when they are unable to follow dispatch for safety, legal, regulatory or environmental reasons.*

Recommendation 3-5 (Chapter 3 Section 4.2)

- *The IESO should initiate a rule change to make Intertie Offer Guarantee (IOG) payments subject to offsets where affiliated market participants are simultaneously importing and exporting.*



Recommendations to IESO and Hydro One

Recommendation 3-2 (Chapter 3 Section 2.5)

- *The IESO should expedite completion of the necessary agreements with Hydro One, the Midwest ISO and ITC Transmission for operation of the phase angle regulators on the Michigan intertie. The IESO (and Hydro One) should also complete necessary staff training as soon as possible. Any improvement on the spring 2008 implementation target would have positive efficiency (as well as reliability) effects on the Ontario (and Midwest ISO) system and any slippage would have the opposite effects.*
- *Hydro One should work towards developing ratings that will safeguard the phase angle regulators and provide operationally useful limited time ratings as soon as possible.*



Recommendations to Hydro One

Recommendation 3-6 (Chapter 3 Section 4.3)

- *It is important for the efficiency of the Ontario electricity market that Hydro One attempt to complete the Queenston flow west transmission expansion as soon as practicable. The ability to fully utilize 'bottled' generation in the Niagara region and maximize economically viable imports with New York (and Michigan) will enhance the efficiency (and reliability) of the Ontario market.*



Recommendations to IESO and OPA to improve transparency

Recommendation 4-1 (Chapter 4 Section 2)

- *The Ontario Power Authority should create more transparency regarding the ongoing monthly payments and energy delivered for each of its various procurement programs in order to promote a better understanding of the costs and effectiveness of these programs and to help market participants gain a better understanding of the component costs of the Global Adjustment.*
- *Similarly, the IESO should consider providing aggregate monthly payments associated with Ontario Power Generation's regulated baseload assets, as it currently does for the OPG Rebate.*



Recommendation 3-8 (Chapter 3 Section 4.4.6)

- *The Panel recommends that the Ontario Power Authority structure future contracts to maintain the energy market price as the driver for production decisions (for example, using a strike price structure similar to the payment provisions in the existing clean energy supply contracts).*

Policy issue – efficiency of public agency contracts

- The spot market continues to have a central role to play in ensuring that consumption, investment and dispatch decisions in the hybrid market are efficient.
- MSP has reviewed the various public agency (OPA and IESO) contract structures to provide guidance on creating contracts that work well within the hybrid market structure and enhance efficiency.
- Strike price contracts (CES style) appear to operate efficiently whereas many of the other contracts contain incentives or triggers which can induce inefficient behaviour.



Policy issue – efficiency of public agency contracts

- Changes in output from OPA standard offer generators appear simply as changes in demand to the IESO and become part of the demand forecast error.
- Significant demand forecast error may lead the IESO to have to constrain on generation or in some areas, to reduce transmission capability to handle forecast uncertainty.
- Better information from these generators should reduce potential inefficiencies.



Policy issue – efficiency of public agency contracts

- The MSP has noted that several of the contract structures may place externalities on loads.
 - Standard offer contracts involve generation “behind a meter” (LDC or a load’s revenue meter) and as a result allow for the avoidance of some uplift costs.
 - With uplifts rising as new contracted generation comes to market, uplift avoidance will lead to larger uplifts being shared across a smaller pool of load.



Summer of 2007– key findings information purposes only

- Market worked reasonably well according to its design
- Hourly prices generally reflected underlying supply and demand forces
- No evidence of abuse of market power or gaming



Price indicators

- Average HOEP higher than a year ago by \$0.45/MWh (1%)
- Effective load-weighted HOEP increased by \$1.20/MWh (2.3%) in the summer of 2007 compared to 2006
- Energy prices more dispersed with
 - more hours with prices and above \$70/MWh and
 - more hours with prices below \$20/MWh.
- Ontario HOEP the lowest 6 month price compared to surrounding markets: NY, PJM, MISO and New England
- OR prices continuing to decline
 - Off-peak OR prices fell by 50% over all categories compared to summer 2006.
 - On-peak OR prices declined in May and increased in June

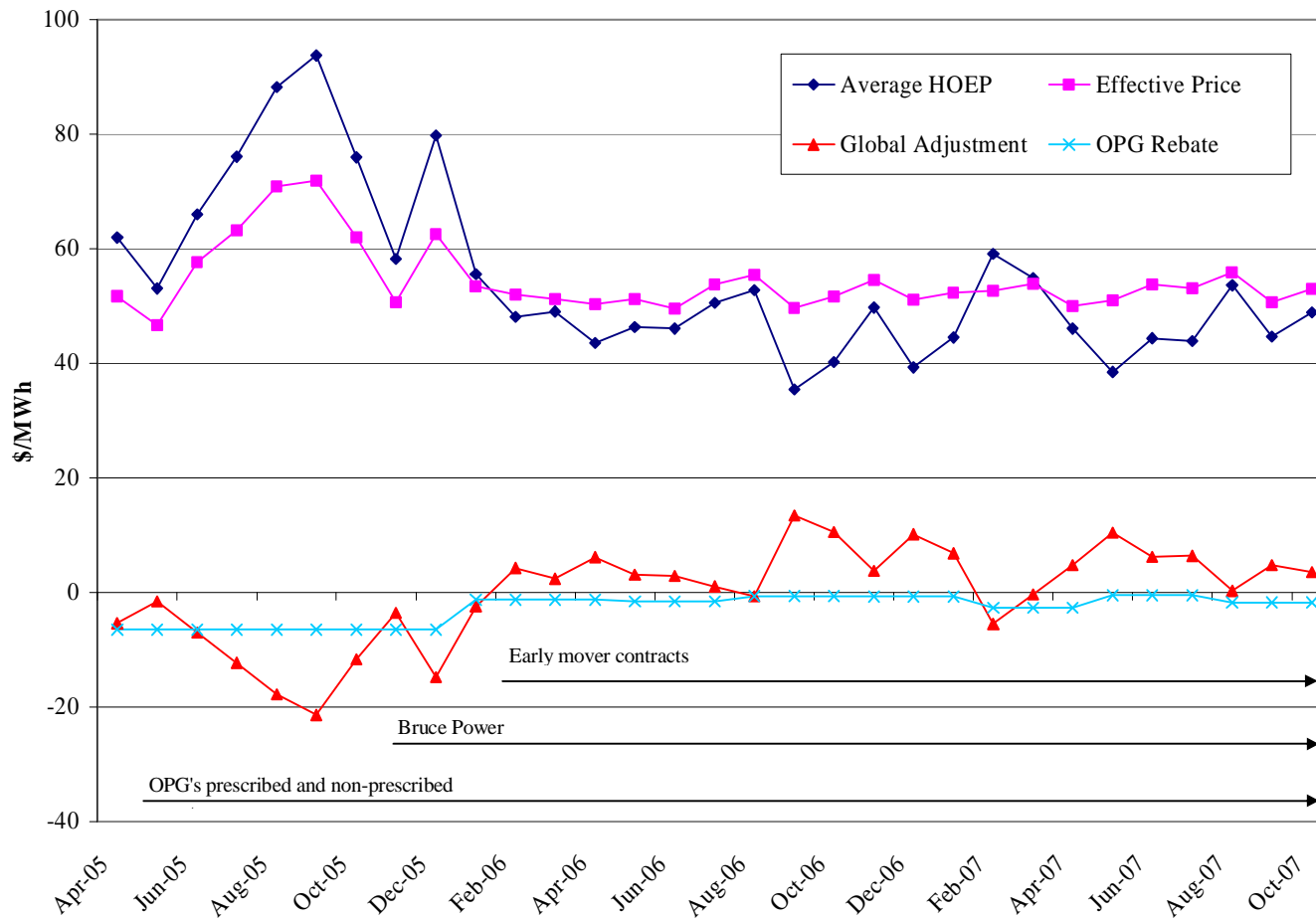


Non-market uplifts

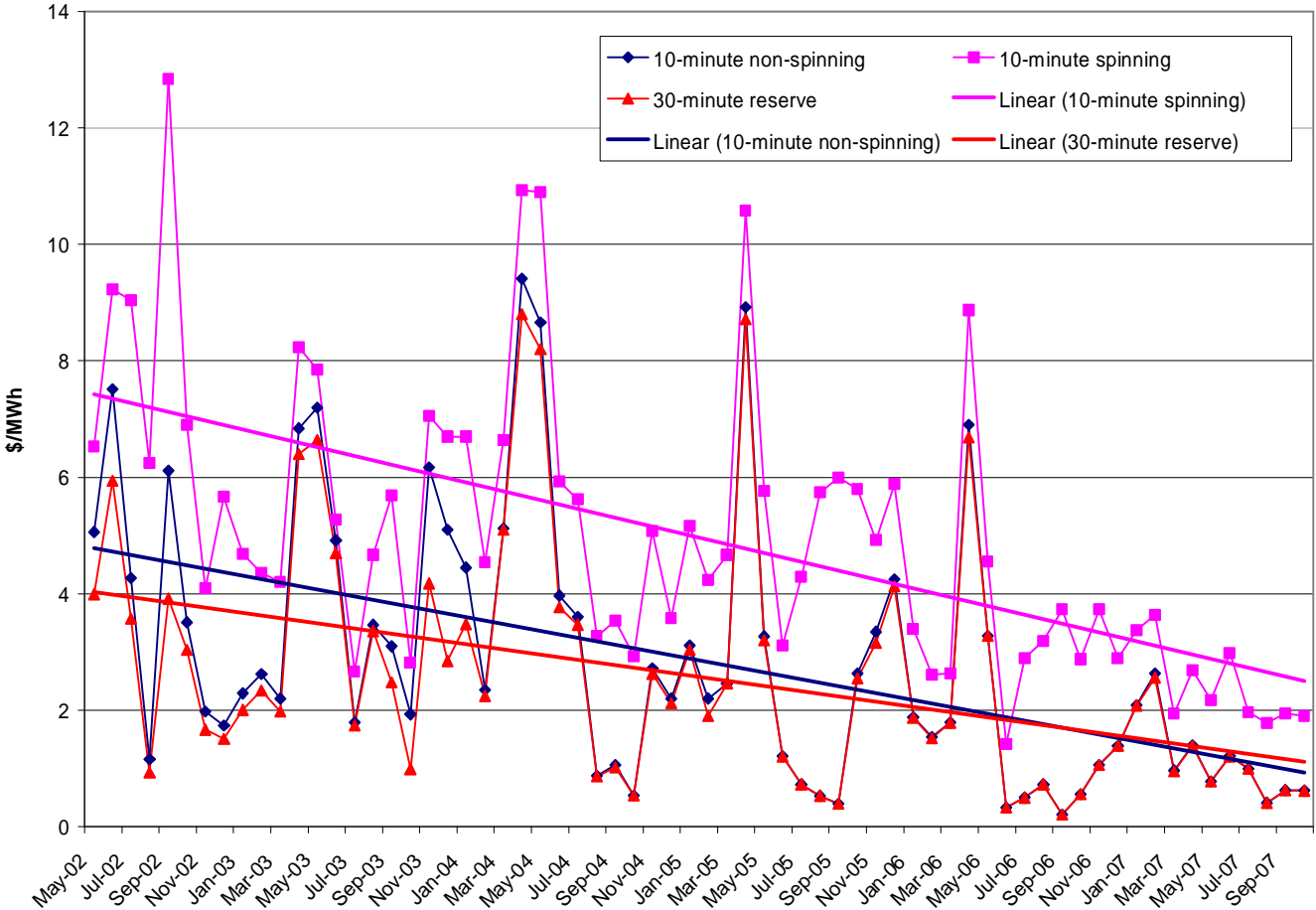
- Effective price to consumers, after the Global Adjustment's and OPG Rebate, is higher by \$1.20/MWh (2.3%).
- Upward pressure on the effective price is due to increased OPA uplifts. The Panel has recommended more transparency on the OPA programs generating uplifts.



Monthly HOEP versus effective HOEP



OR prices

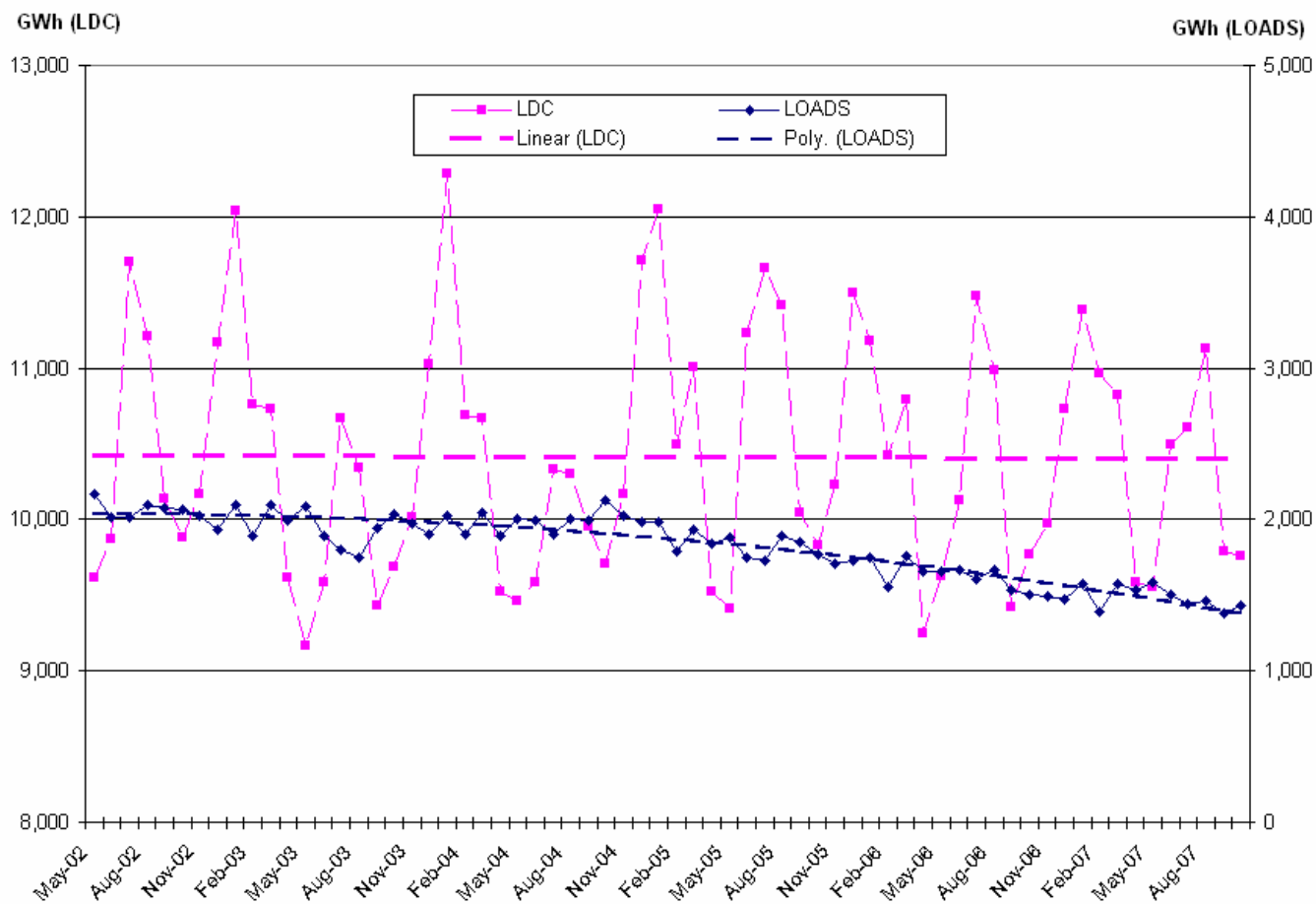


Demand indicators

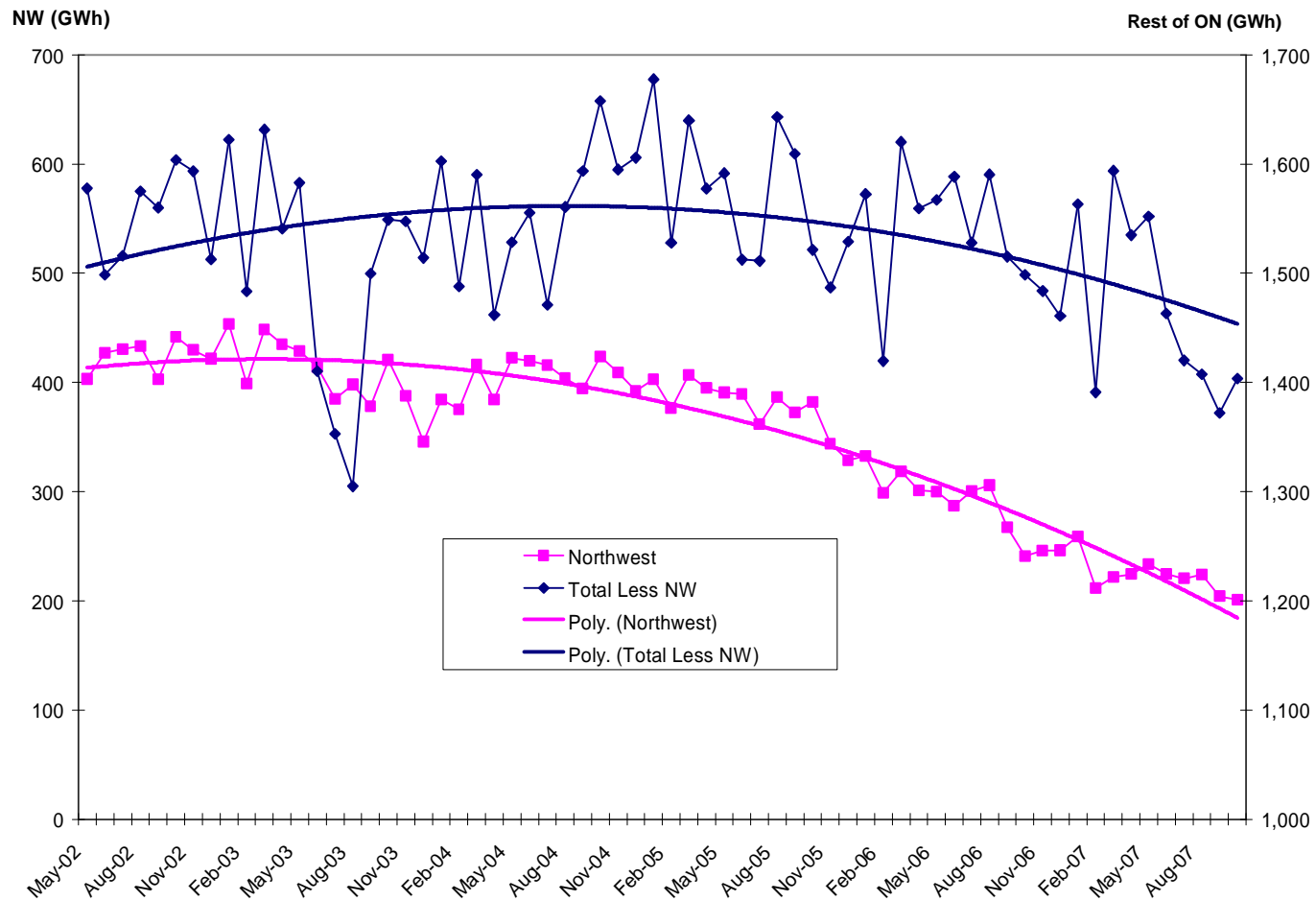
- Ontario demand down by 0.65 TWh (0.9%).
 - Wholesale load continues to drop (principally due to wood processing facilities in the northwest).
 - Wholesale load has declined on average 10% (600 GWh) since the 2004 summer months.
- Exports increased by 240 GWh (4%).
- Ontario was generally a net exporter (except in September and October, due to major nuclear forced outages).



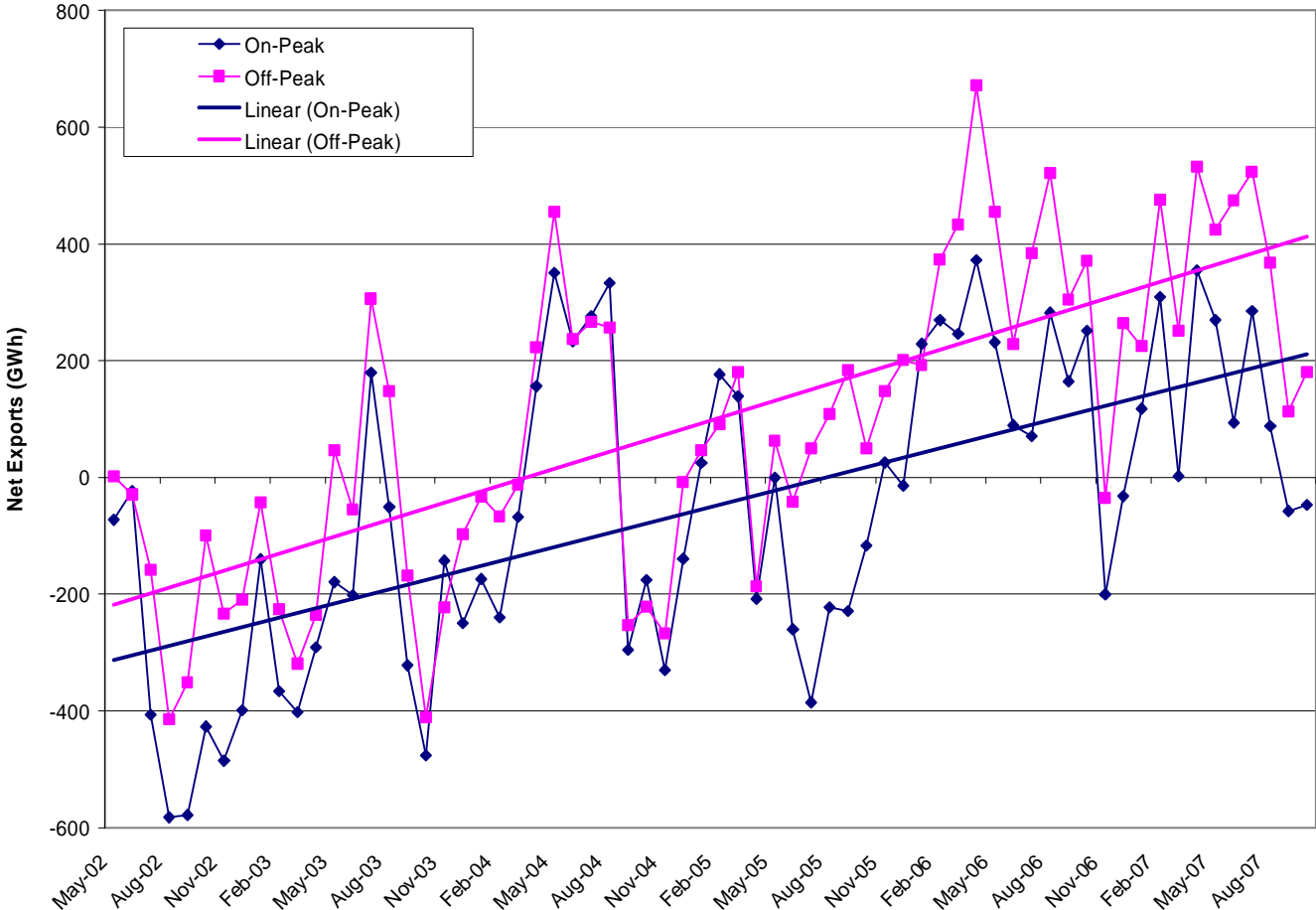
Wholesale load declining



Wholesale load declining cont'd



Monthly net exports in GWh

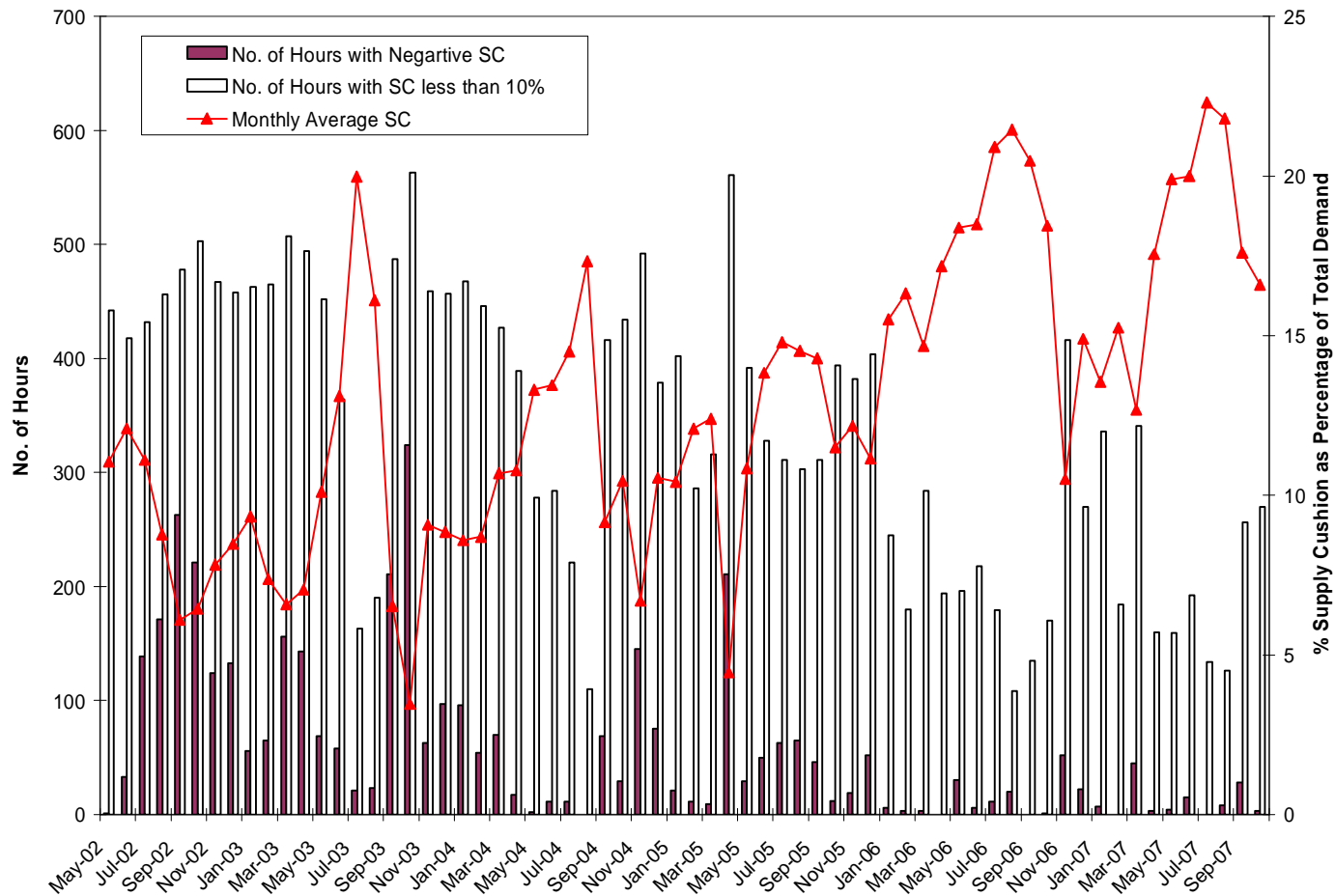


Supply indicators

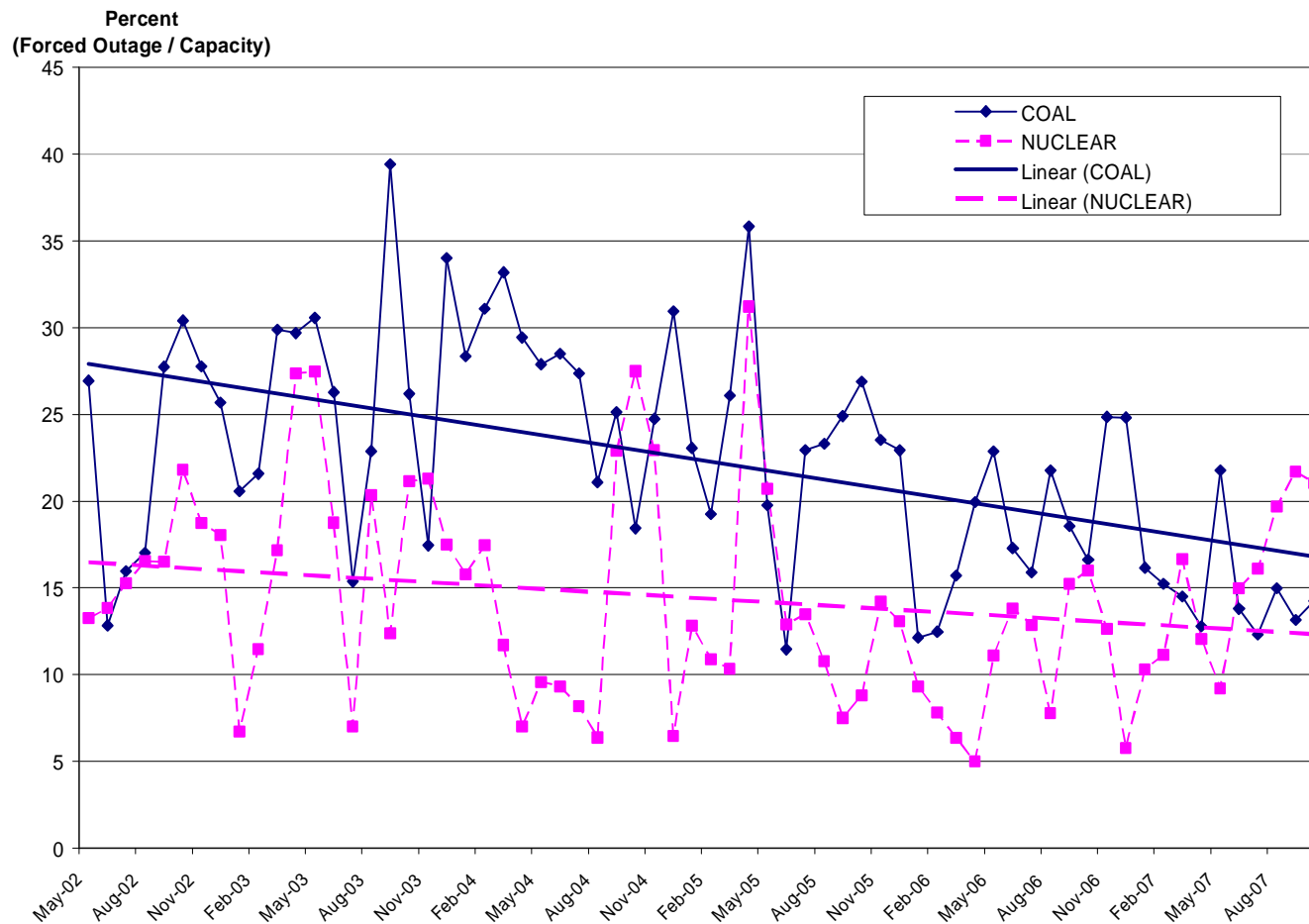
- Supply cushion has been progressively increasing since 2003 with both new generation and declining consumption.
- Coal-forced outage rates have declined continuously since 2003.
- Nuclear-forced outage rates have increased recently due to forced outages at Pickering generators.
 - Everything else held equal, prices in September / October 2007 would have been roughly \$3/MWh lower if Pickering had a similar outage pattern as 2006.
- Imports increased by 880 GWh (31%).



Improved supply cushion conditions



Forced outages relative to total capacity by fuel type

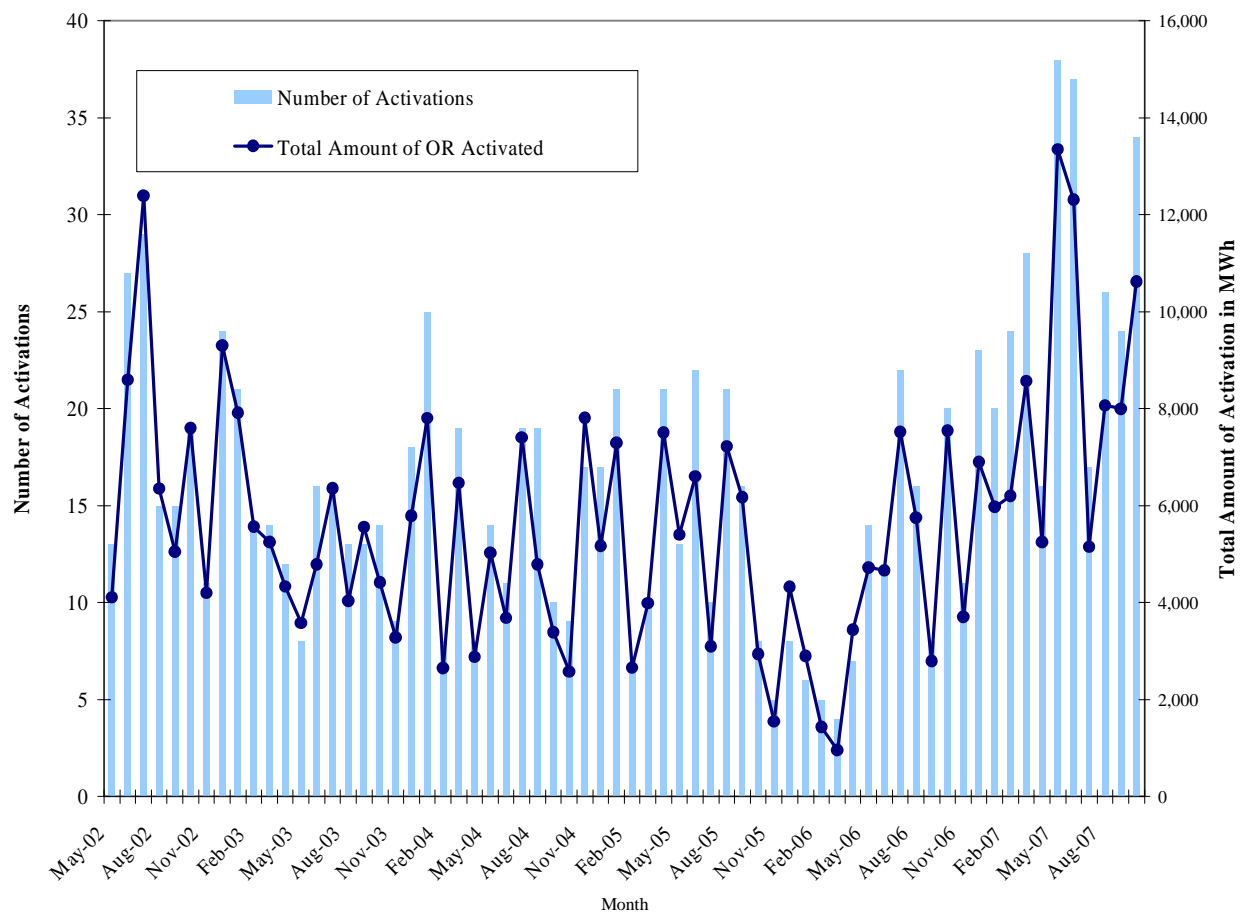


Supply indicators cont'd

- Operating reserve activations have been progressively increasing since the beginning of 2007. MSP has asked the MAU to report back on likely reasons for this increase in OR activations.
- Panel has noted an increase in the self-scheduling error (attributed mainly to wind).
 - While presently a small problem with only 400 MW of wind, the MSP believes the problem will grow with anticipated large increases in OPA Standard Offer Contract generation, both renewable and “clean” energy.
 - Self-scheduling error leads to inefficiencies.



Operating reserve activations

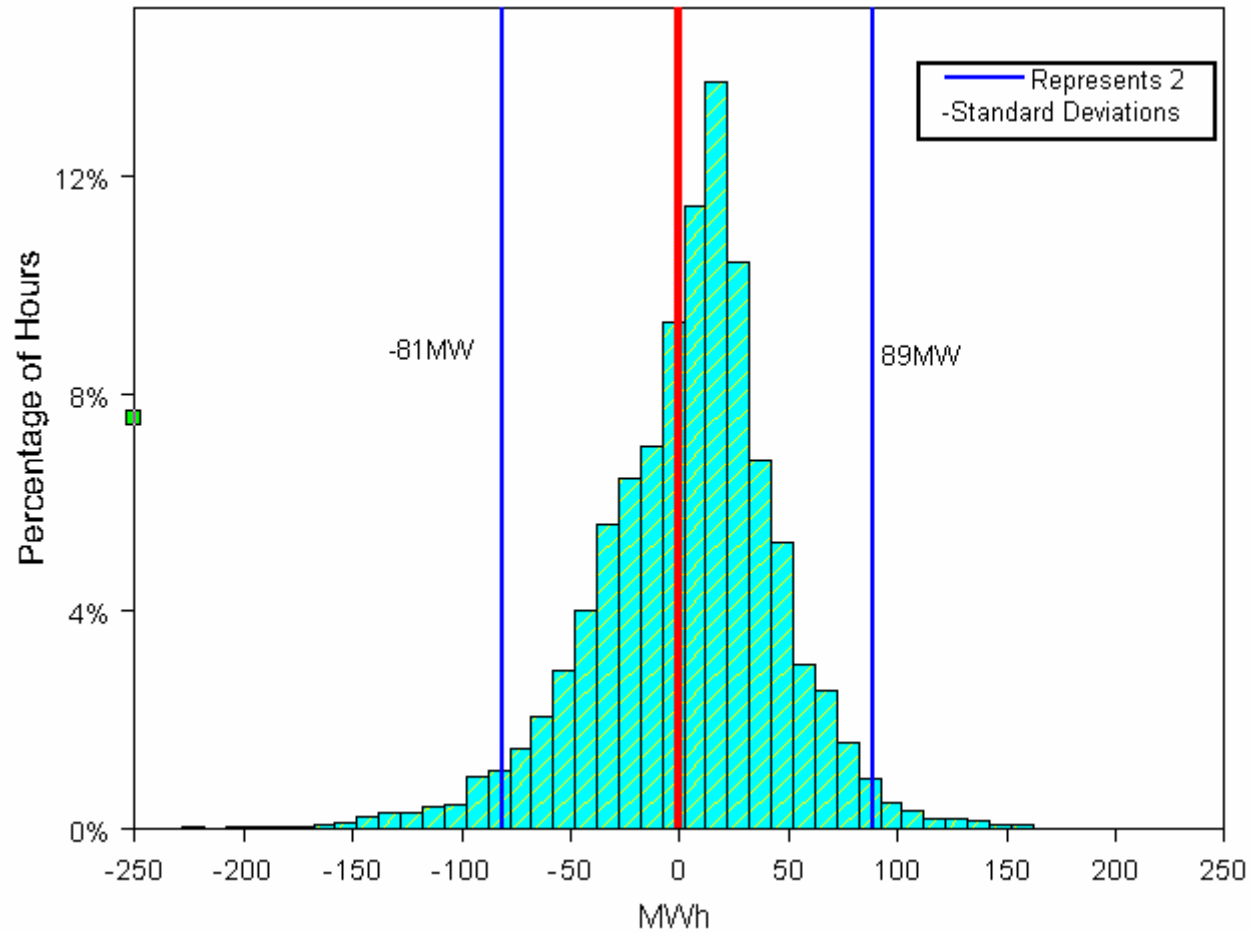


Hourly market uplifts

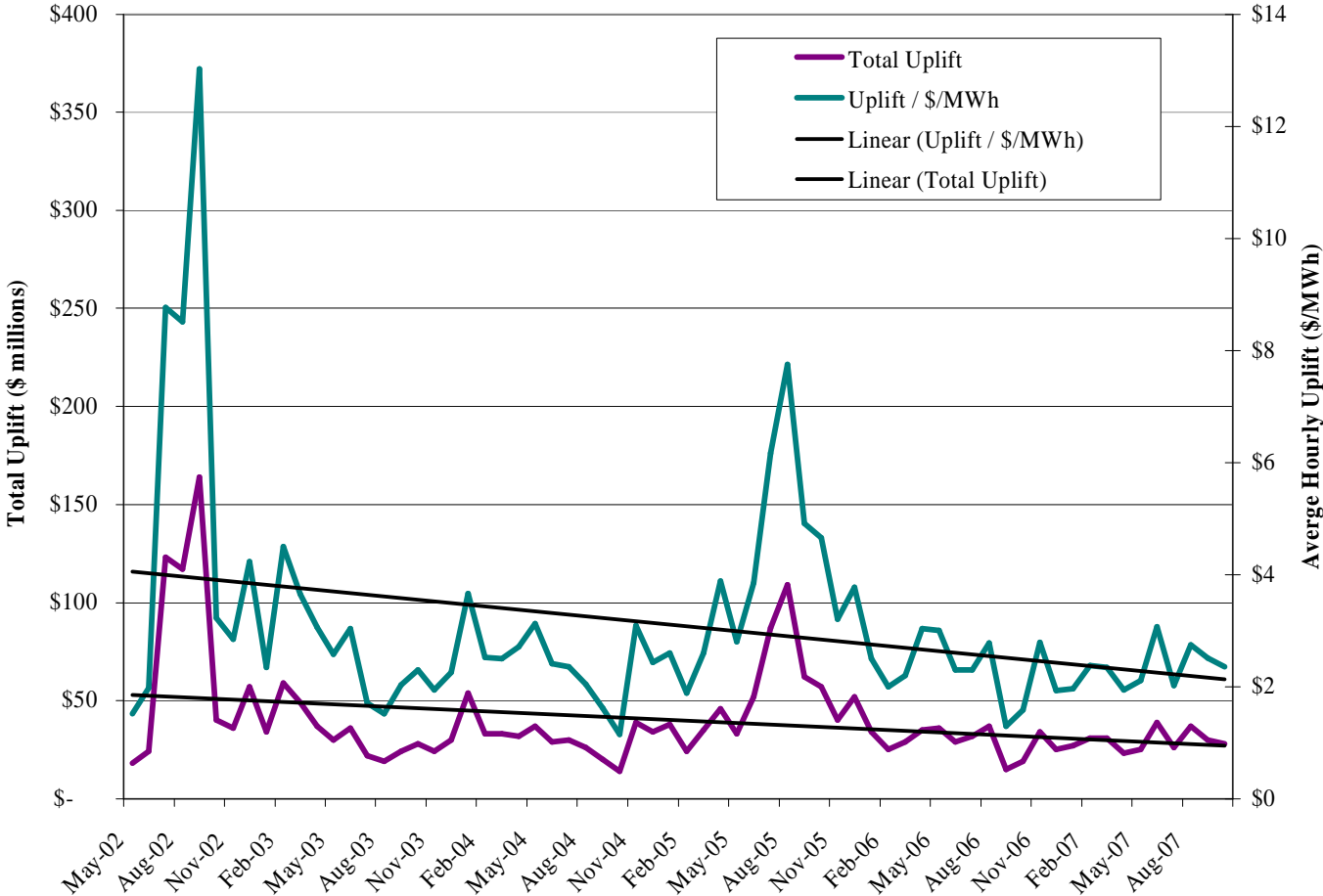
- Hourly uplift increased from \$167 million in 2006 to \$183 million in 2007 (10%).
 - Mostly the result of a \$10 million increase in (CMSC) payments
 - Also a \$5 million increase in (IOG) payments.
 - Constrained-off import payments to the Northwest account for most of the increase in CMSC
 - Day-ahead IOG payments account for most of the IOG increase.
- Shadow Prices in the Northwest averaged \$-136/MWh due to abundant Hydroelectric energy and low Northwest demand.
 - Generators receive profit equivalent to HOEP when Constrained-off



Wind forecast error on 400 MW of wind capacity

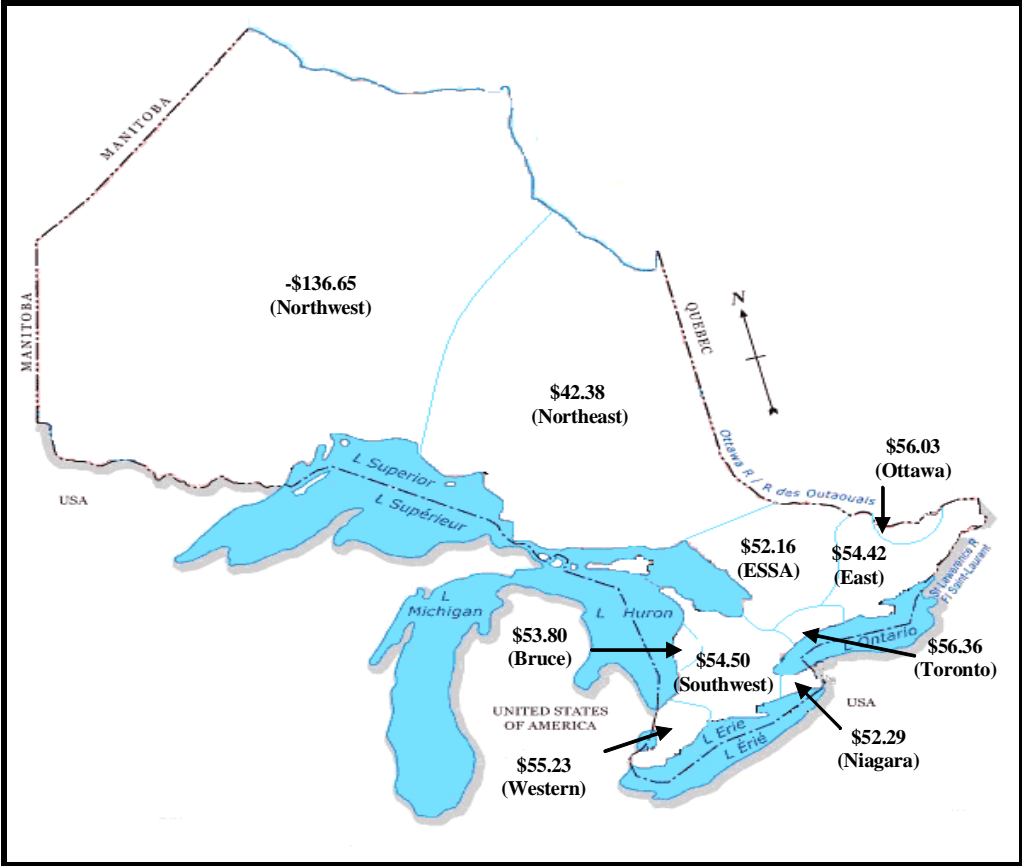


Hourly market uplifts



Shadow prices

(\$/MWh)



High price hours

- 4 hours with HOEP > \$200/MWh
- Factors previously identified by the Panel continue to explain price spikes
 - Real-time demand higher than pre-dispatch forecast
 - Generating units available in pre-dispatch fail to deliver in real-time
 - Imports fail real-time delivery



Low price hours

- 331 low price hours where HOEP < \$20/MWh
 - An increase of 142 hours from the previous period.
- 1 hour with negative prices.
- Factors previously identified by the Panel continue to explain low prices
 - Low market demand
 - Abundant base-load supply
 - Demand forecast errors
 - Failed exports





THE END

