ieso
Power to Ontario.
On Demand.

Pricing Events – January & February 2009

April 7th, 2009
MPWG

Agenda

1. Overview
2. Discussion
   - High-price hours
   - Low-price hours
   - Negative MCP
   - Prices compared to uplifts
   - MCP Volatility
   - Operating reserve pricing and activations
   - Demand response programs
   - Administered pricing
   - Emergency control actions
3. Special March Events: Record low pricing weekend

Overview – January Summary

- Average Hourly Ontario Demand: 18,454 MW
  - Minimum: 13,872 MW
  - Maximum: 22,983 MW
- Total Ontario Demand: 13.73 TWh
- Average Net Exports: 1,550 MW
- Average HOEP: $53.22 /MWh
  - Peak: $62.32 /MWh
  - Off-peak: $45.73 /MWh
- Average OR Prices
  - 10S: $6.73 /MW/hr
  - 10N: $6.73 /MW/hr
  - 30R: $6.27 /MW/hr
- Wind Generation: 189.4 GWh
  - Capacity: 30.6% from fully in-service projects

Overview – February Summary

- Average Hourly Ontario Demand: 17,409 MW
  - Minimum: 13,312 MW
  - Maximum: 22,110 MW
- Total Ontario Demand: 11.7 TWh
- Average Net Exports: 1,335 MW
- Average HOEP: $ 47.24 /MWh
  - Peak: $57.78 /MWh
  - Off-peak: $38.53 /MWh
- Average OR Prices
  - 10S: $10.18 /MW/hr
  - 10N: $10.17 /MW/hr
  - 30R: $9.16 /MW/hr
- Wind Generation: 207.5 GWh
  - Capacity: 36.9% from fully in-service projects

Hours in which HOEP > $200

Date	Hour	HOEP	Issue(s)
January 16th	8	$403.47	• Under forecast of demand of 300 MW due to incorrect temperature estimates • Forced derate of approximately 560 MW • Forced outage of approximately 490 MW
January 16th	9	$474.76	
January 16th	10	$208.94	

Hours in which HOEP > $200

Date	Hour	HOEP	Issue(s)
February 18th	11	$1039.27	• Circuit trip resulted in initial 825 MW generation forced outage • Other contingencies resulted in a total generation loss of approximately 1,700 MW • Total reserve requirement increased to 2131 MW
February 18th	12	$1891.14	

Hours with HOEP < $20

- There were 25 hours in January where HOEP was less than $20.
  - Of these, none were negative HOEP.

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  - Of these, none were negative HOEP.

Negative MCPs

- There were no instances of negative market clearing prices for the month of January.

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Anomalous Uplifts

- NOTE: The Market Surveillance Panel has amended its standard for investigating anomalous pricing events.
  - $500 000 CMSC or IOG payments in an hour
  - $1 000 000 CMSC or IOG payments on an intertie in a day
  - $100 000 OR payments in an hour

- There were no instances where IOG was greater than $500,000 in an hour.
  - On Wednesday, February 18th HE 11 total CMSC was $506,000.
- There were no instances where CMSC or IOG payments on an intertie in a day were greater than $1,000,000.
- There were 2 instances where OR payments exceeded $100,000 in an hour.

Anomalous Uplifts Continued

Hourly OR payments greater than $100,000

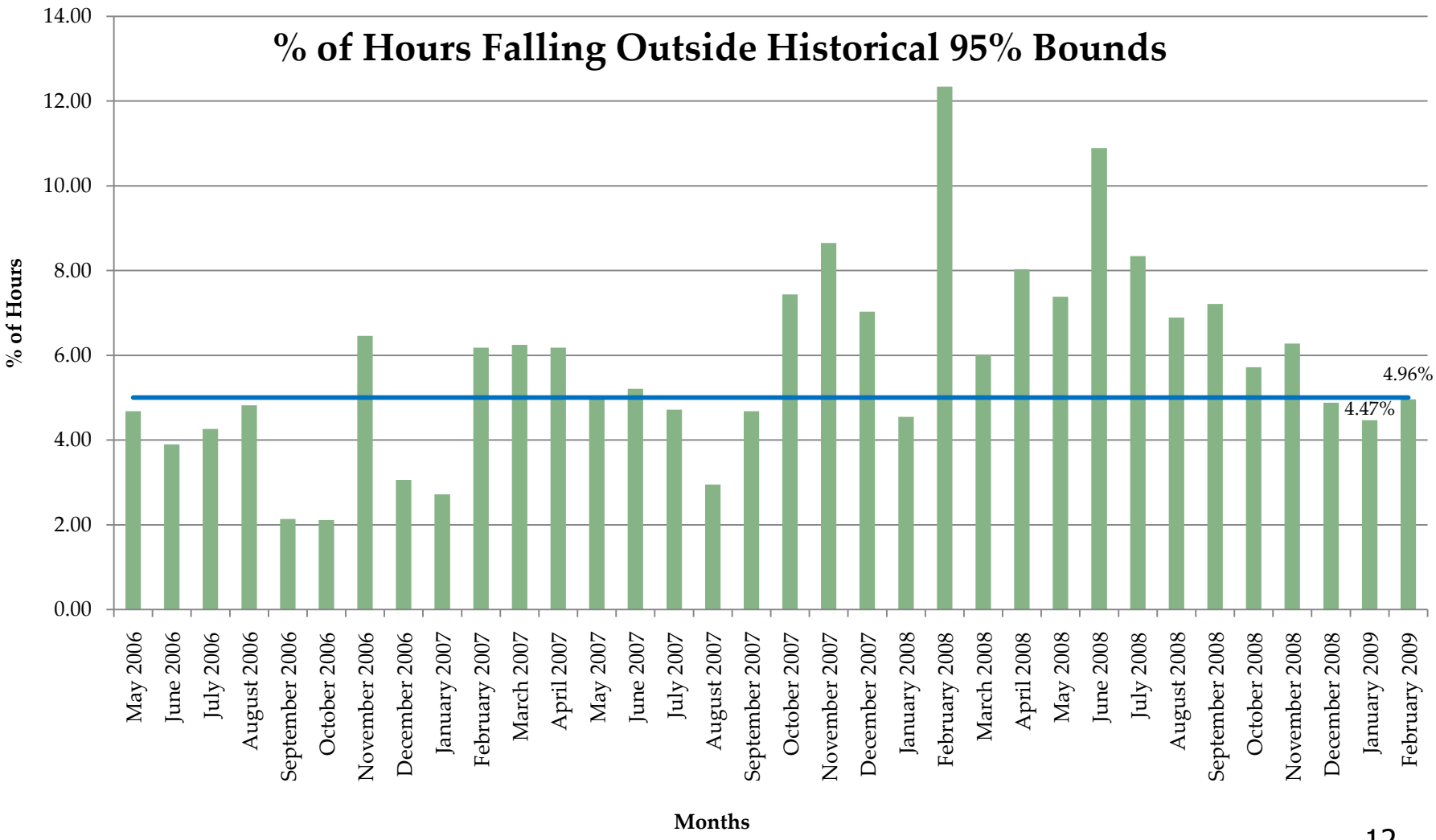
2 Instances: 4 Hours

- January 16, HE 8, $152,000
- January 16, HE 9, $299,000
- February 18, HE 11, $550,000
- February 18, HE 12, $1,457,000
  - Both of these instances correspond with contingencies that resulted in large OR activations and an increase in reserve requirements *(slides 5, 6)*

MCP Volatility

- To measure MCP volatility we calculate the proportion of current period interval-to-interval price changes that exceed certain thresholds
  - Thresholds constructed using previous 4 years of monthly data
  - Capture 95% of historical interval-level price changes
- If current month's prices are equally volatile to the average of the same month in the 4 previous years, value will be 5%
  - Value will be higher if prices are more volatile than in previous years

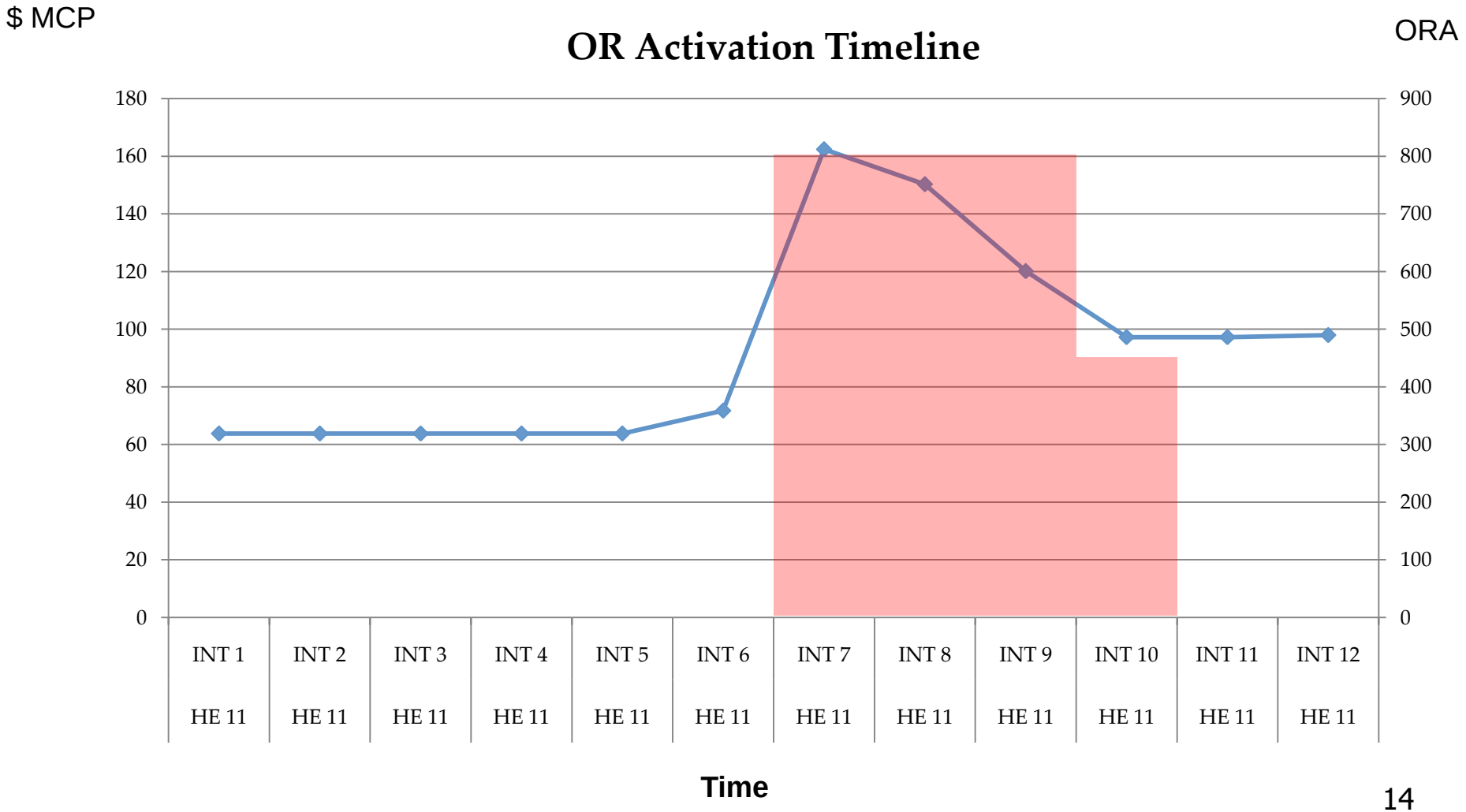
MCP Volatility Findings



January OR Activations

- 21 Hours with OR activations.
- Largest activation occurred on Monday 19th at 10:30.
  - 800 MW OR activated
  - Cause:
    - 800 MW generation loss
  - Duration: 21 minutes

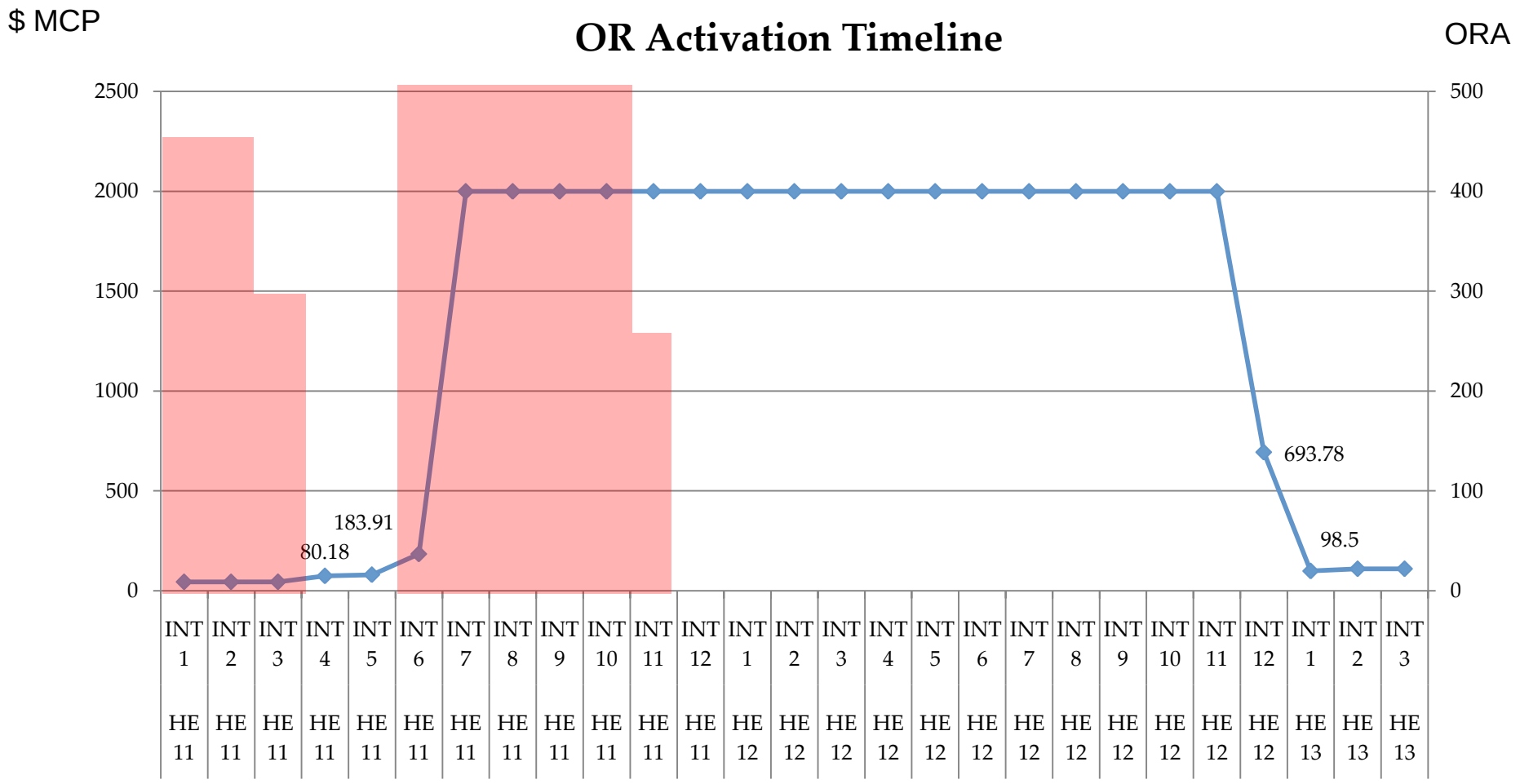
Monday, January 19th OR Activation



February OR Activations

- 13 Hours with OR activations
- Largest activation occurred on Friday 18th at 10:25
  - 450 MW OR (and 450 MW SAR) initially activated and deactivated 15 minutes later
    - See following graph
  - 500 MW OR subsequently activated
  - Cause: Circuit trip resulting in 1700 MW generation loss
  - Duration: 55 minutes

Wednesday February 18th OR Activation



DR Activations, Administered Pricing & Emergency Control Actions

January 2009

- No DR3 program activations
- 10 events required administered pricing
  - 66 intervals due to planned outages
- There were no emergency control actions in January

DR Activations, Administered Pricing & Emergency Control Actions

February 2009

- No DR3 program activation
- 7 events required administered pricing
  - 9 intervals due to planned outages
  - 13 intervals due to input data problems
- There were no emergency action controls in February

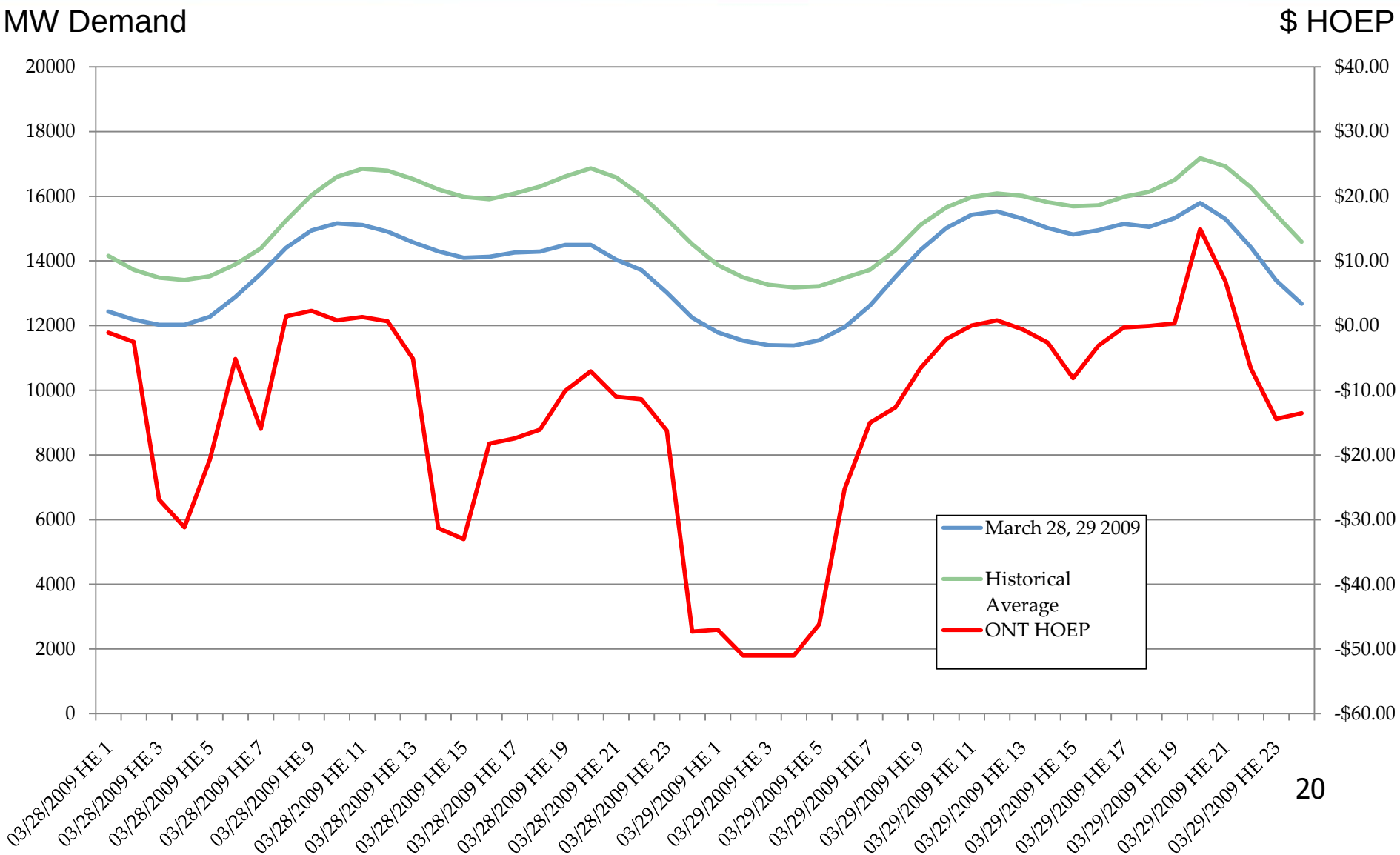
March 28th and 29th Special Event: Low Priced Weekend

- Over the course of the March 28th and 29th weekend 38 out of 48 hours had negative HOEP.
- All time record low HOEP set at -$51/MWh

Causes:

1. The first driver for these low priced hours is low demand. Over the weekend we hit a minimum demand of 11,800 MW which is not far off our lowest demand for all of 2008.
   - This demand is extremely low for this time of year, and is highly temperature dependant.
   - Mild weather, maximum temperature of 12.2° C and an average of 7.3° C across the weekend.

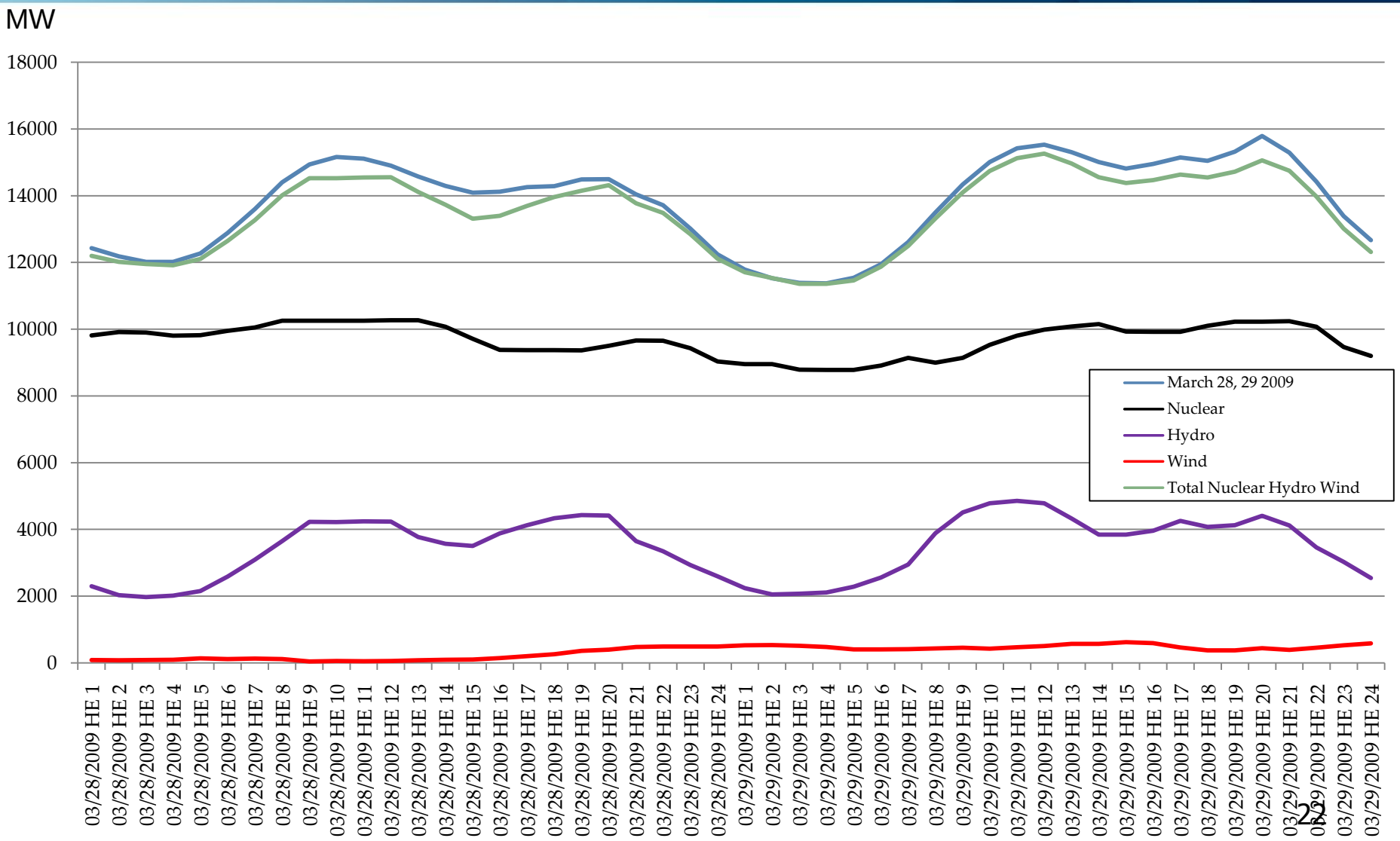
Low Demand


MW Demand
$ HOEP
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
$40.00
$30.00
$20.00
$10.00
$0.00
-$10.00
-$20.00
-$30.00
-$40.00
-$50.00
-$60.00
March 28, 29 2009
Historical Average
ONT HOEP
03/28/2009 HE 1
03/28/2009 HE 3
03/28/2009 HE 5
03/28/2009 HE 7
03/28/2009 HE 9
03/28/2009 HE 11
03/28/2009 HE 13
03/28/2009 HE 15
03/28/2009 HE 17
03/28/2009 HE 19
03/28/2009 HE 21
03/28/2009 HE 23
03/29/2009 HE 1
03/29/2009 HE 3
03/29/2009 HE 5
03/29/2009 HE 7
03/29/2009 HE 9
03/29/2009 HE 11
03/29/2009 HE 13
03/29/2009 HE 15
03/29/2009 HE 17
03/29/2009 HE 19
03/29/2009 HE 21
03/29/2009 HE 23

2) Abundance of baseload generation.

- Strong nuclear fleet performance averaging 9,700 MW across the days
- Hydroelectric units were preparing for freshet by emptying their reservoirs, average of 3,500 MW across the days
- New gas-fired generation was under commissioning
- Particularly windy weekend, with peak wind output at 620 MW, and averaging 330 MW across the weekend.

Abundance of Baseload Generation



- Transmission outages
  - Reduced tie-line capabilities resulted in less export capacity. Higher prices in other jurisdictions would have driven exports and helped to negate our alleviate our abundance of generation supply.
    - Curtailed import transactions during lowest priced hours (March 29th HE 1 and HE 2)
  - 500kV circuit that links North-eastern Ontario with the rest of the system, helped to worsen the bottling of surplus energy in the south.

Transmission Outages