# Policy/Design Issues in Ontario's Electricity Market

Roger Ware

Queen's University

Member of the OEB Market Surveillance Panel, 2010 - 2013

# Summary

- Some observations on Global Adjustment
- Some observations on Strategic Behaviour (Gaming) in the Ontario Electricity Market
- Conclusions

# Global Adjustment

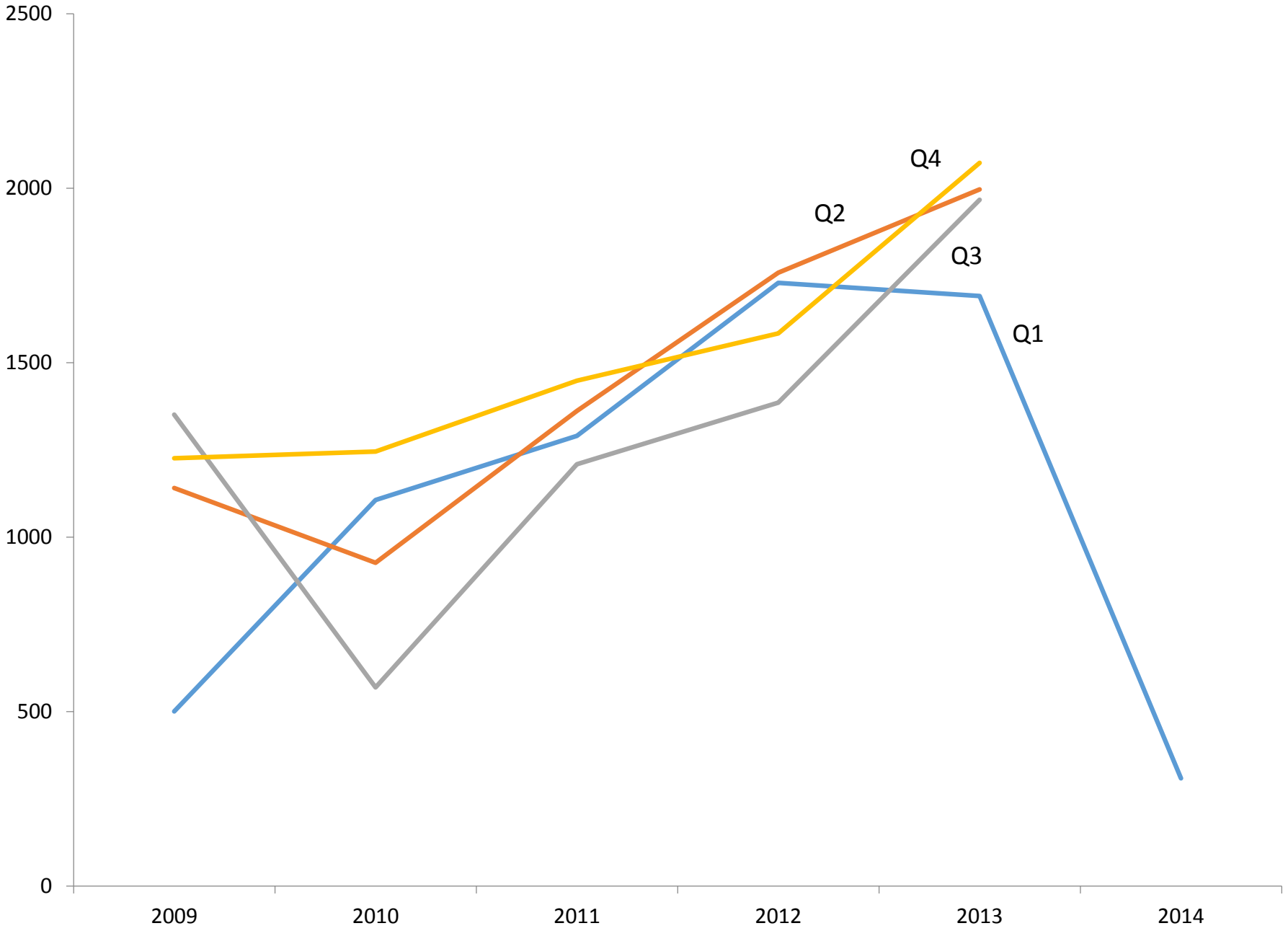
MSP 20

- Global Adjustment is a charge collected from Ontario (but not export) customers that is mainly used to recover any shortfall in the costs of generation contracts or regulated rates not covered by wholesale market revenues.
- Because the regulated rates and the prices paid under these contracts on average have exceeded the average HOEP, the GA has grown considerably
- It is generally (but not always) positive, although in March 2014 it turned slightly negative.

- Two publicly available sources, the MSP 20 report and Navigant Report (see cite in MSP 20 footnote)
- Several interesting issues from an economic perspective

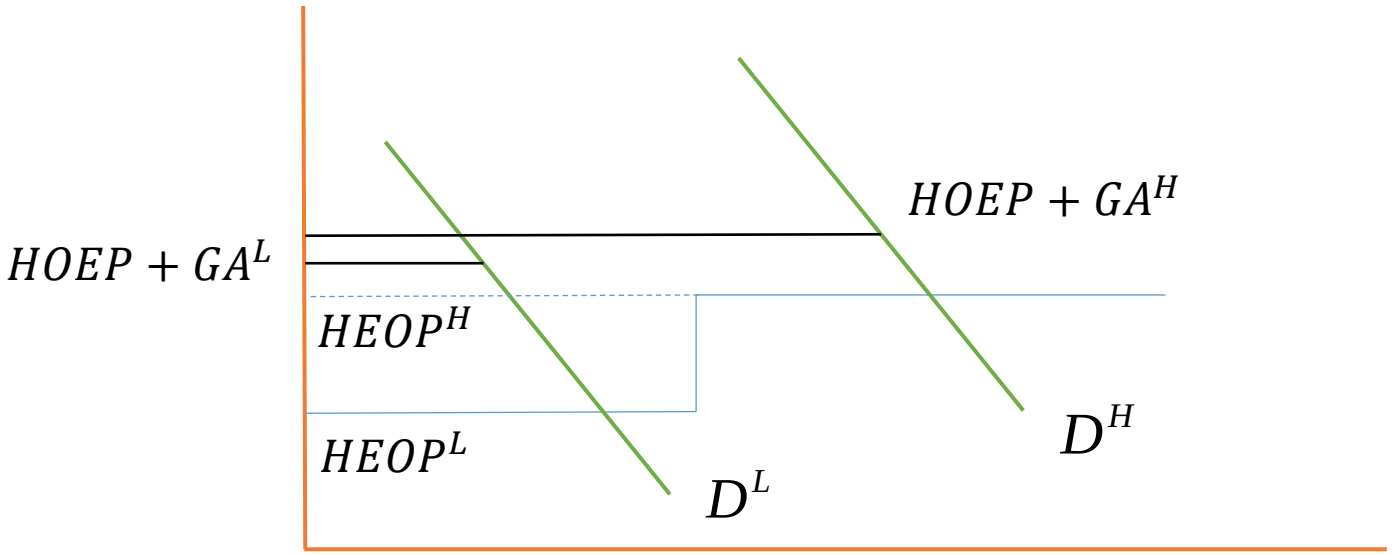
# Global Adjustment, 2009 – 2014 ($ Millions)

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| **2009** | 500.6 | 1141.2 | 1351.4 | 1226.3 |
| **2010** | 1106.2 | 926.7 | 569.3 | 1245.5 |
| **2011** | 1290.3 | 1361.7 | 1209.2 | 1448.4 |
| **2012** | 1728.8 | 1757.7 | 1385.4 | 1583.8 |
| **2013** | 1691 | 1996.6 | 1966.8 | 2072.9 |
| **2014** | 309.1 | | | |


2500
2000
1500
1000
500
0
2009
2010
2011
2012
2013
2014
Q4
Q2
Q3
Q1

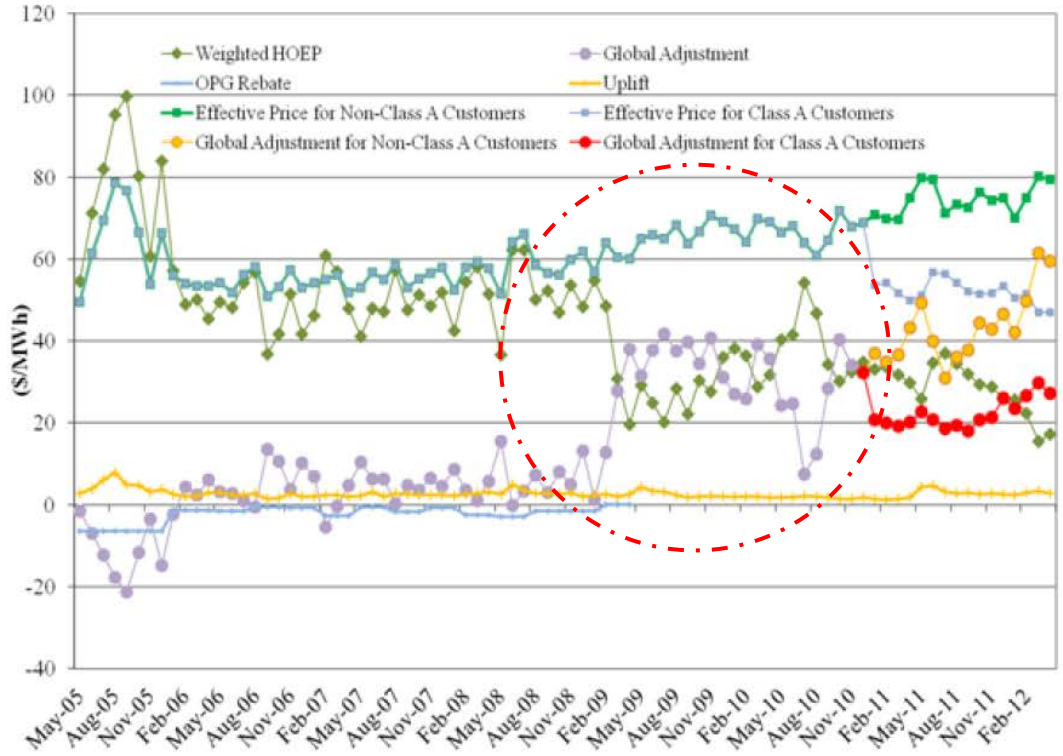
# Price Fidelity and Efficient Pricing for Electricity

- Price Fidelity – Policy commentaries are full of exhortations for electricity pricing to exhibit more "price fidelity". But what does price fidelity actually mean?
- Proponents seem to mean that prices facing end users could be closer to short run marginal cost. In Ontario's market that would mean prices closer to the HOEP.
- The virtue of such prices is that they will accurately reflect the cost of consuming power at different times and in different seasons and provide efficient incentives for conservation.
- But (my concern) short run marginal cost prices are rarely second best optimal.


$HOEP + GA^H$
$HOEP + GA^L$
$HEOP^H$
$HEOP^L$
$D^H$
$D^L$

# To illustrate from some data (MSP 19, p.16)

***Figure 1-2: Monthly Average Effective Price***
***May 2005 – April 2012***
***($/MWh)***



# 2011 Reallocation of Global Adjustment

- [describe how it changed]
- Efficiency implications are interesting but difficult to quantify
- A major effect of the reallocation is redistributive: The Market Surveillance Panel estimated that “approximately $290 million in GA costs was shifted from Class A consumers to Class B consumers in 2012 (the corresponding amount for 2011 is $210 million)”
- A very crude estimate for 2013 (not using the Sen model but simply scaling the estimate by the amount of GA in the 2013 summer months) suggests a redistribution of nearly $400 million from Class A to Class B consumers.

# Efficiency Effects of GA Reallocation

- Four broad effects
  I. The revised GA allocation methodology provides a strong incentive for Class A customers to try to predict the peak demand hours and significantly reduce consumption during those hours.
  II. Class A customers from 2011 onwards face a two part pricing scheme in contrast to the earlier volumetric or uniform pricing scheme, which is still faced by Class B customers.
  III. Class B customers pay a greater share of GA under the new scheme, with consequences for efficiency.
  IV. It has been suggested that the “participation constraint” of some large power consumers has been eased by the new GA allocation model *i.e.* large customers who might have left the province may have decided to stay.

# I.

- The Market Surveillance Panel calculated the effective price to Class A customers of consuming electricity in one of the High 5 Peak hours. The price is []!
- The above assumes that customers can predict peak hours with certainty, which in some years may be possible, but in a typical case such predictions can only be made with some probability of success. This would reduce the effective price to an “expected price” which would still be extremely high – far above the likely benefit of consuming.
- The price is also far above any reasonable measure of long run incremental cost – so the reduction in Class A consumption in Peak hours for strategic reasons represents a loss in efficiency.

# II. Move to two part pricing for Class A customers

- Since 2011 – Class A customers face a fixed GA contribution (based on the previous periods consumption) and a marginal price equal to the HOEP.
- This implies an efficiency gain for those customers

# III: Effect of GA Reallocation on Class B consumers

- The redistribution requires an increase in the volumetric price faced by Class B customers

# IV.

- No evidence that any Class A consumers would have ceased operation in Ontario if the reallocation had not taken place.

# Strategic Behaviour (Gaming) in the Ontario Electricity Market

- As early as the Market Design Committee's work, there has been an awareness that the market opening could create the potential for strategic behaviour.
- As the hybrid market has matured and been amended in various ways, many opportunities for gaming have emerged, some of which have prompted investigations by the Market Surveillance Panel.
- Almost all gaming behaviour by market participants creates inefficiency, and an inappropriate and a costly burden to loads.

- The Panel has initiated several gaming investigations, only two of which have been reported on (*Trans Alta Marketing Corporation* and *West Oaks NY/NE LP*) in October, 2012.
- Rather than discuss the findings of the outstanding investigations, which I am not able to do, I will focus on the economic issues and incentives that underly widespread concerns about gaming in the Ontario Electricity Market (my statement not the MSPs or the OEBs).

# MSP definition of gaming

- In the two published reports of gaming investigations, the Panel defines gaming as conduct that involves
  i. a “market defect” (being a defect in the market design, poorly specified rules or procedures, or a gap in the Market Rules or procedures);
  ii. Exploitation of the market defect by the market participant;
  iii. Profit or other benefit to the market participant;
  iv. Expense or disadvantage to the market.

# A (non-exhaustive) list of examples

I. Strategic avoidance of GA (already discussed)
II. Bidding at a high price to come offline and receive rampdown CMSC
III. Chasing the Nodal Price for constrained off CMSC
IV. Inefficient generator start up to receive GCG payments
V. Strategic use of TRs combined with Intertie Offer Guarantees

# II. High Generator bid prices to come offline

- This issue is slightly more subtle than it first appears. When a generator wishes to come offline it bids a high price, in the expectation that it will not be scheduled (bid price exceeds the HOEP). So far no problem.
- The two schedule system will ramp down the generator in the constrained schedule if its bid price exceeds the shadow price. Still no problem yet.
- BUT (here's the problem) the unconstrained schedule uses a fictitious 3X ramp rate for generators ramping down. This *automatically* implies that the ramping down generator will be constrained on during the ramp down (it will be required to produce more than the fictitious quantity entered into the unconstrained algorithm during the ramp down), and will receive CMSC as a result.
- The amount of CMSC received is directly proportionally to the magnitude of the generator's bid.

- In MSP 19 the Panel reviewed a history of analysis and recommendations to address this issue. e.g. (from MSP 15 that the IESO take “action to limit CMSC payments where the CMSC payments are induced by the generator strategically raising its offer price to signal the ramping down of its generation.”
- This strategic pricing to ramp down was costing approximately $1 million  a month in unwarranted CMSC during 2010 and 2011 (MSP 18)

- In August 2011, the MSP address this issue by publishing a Monitoring Document stating in summary that
- “Panel will normally not consider a gaming investigation to be warranted if the generator utilizes an offer price that is not higher than the greater of (i) 130% of the generator‟s 3-hour ahead constrained schedule pre-dispatch nodal (or shadow) price, or (ii) the generator‟s marginal (or other incremental or opportunity) costs”
- While it remained the MSP’s preference that no CMSC should be paid on ramp down, the Monitoring Document has reduced CMSC paid on ramp down to a small percentage of the $1 million a month figure.

# III. Chasing the Nodal Price

- This is a phenomenon that results from the two schedule system, where generators and loads follow an incentive structure based on the single unconstrained price – whereas actual production and consumption outcomes depend on the constrained, nodal price.
- In NW Ontario – zonal prices are typically low, and well below the HOEP. [Examples?] Zonal prices are largely set by “must run” hydro.
- If a generator or importer bids into the market at a price that is below the HOEP for the unconstrained schedule but above the shadow zonal price for the constrained schedule, they will be constrained off and paid CMSC in an amount equal to the difference between the bid price and the HOEP.

- “Knowing with reasonable certainty that they will be constrained off and will not have to actually deliver power, generators and importers are free to offer at prices well below their actual marginal cost of delivering energy”. (MSP 22)
- Thus, holding everything else constant, a strategically bidding generator would want to bid as low as possible providing that they are just above the shadow price, so as to be both constrained off and to maximize the amount of CMSC received.
- Hence the term “chasing the nodal (shadow) price” – the lower the shadow price is expected to be, the lower a strategic generator will bid in order to capture more CMSC.

# A mitigating twist: Competition for CMSC

- There is an interesting and understudied phenomenon that the MSP discussed briefly in MSP 22.
- If several generators are bidding strategically for CMSC – i.e. there is competition for rents to gaming – a kind of CMSC auction. The lower the bid submitted by each generator, the higher the probability that they will be required to run and not collect CMSC for being constrained off, those rents going to a rival generator who is bidding higher.
- This will create a tendency to want to bid higher, to increase the likelihood of being constrained off, and the net effect of competition will be to mitigate the adverse consequences of chasing the shadow price

- The rule amendment eliminating CMSC for constrained off imports in the NW has led to major reduction in CMSC payments to importers, and to imports in the NW.
- There is a nice discussion of the change in MSP 22 showing clearly that prior to the rule amendment importers were consistently bidding below marginal cost in the expectation of being constrained off and receiving CMSC payments.
- After the rule change these strategic imports disappeared.

# IV. Repeated Generator Stop/Starts

- The MAU observed that some generation facilities synchronize and operate for their MGBRT, then shut for a short period of time (at times for as little as half an hour), and then re-synchronize for another run.
- The MAU observed that this behaviour was creating a high cost to Ontario loads because the cost of shutting down a generation facility only to restart that facility several intervals later typically exceeded what it would have cost to keep that same facility online (MSP 17)
- The MAU estimated the efficiency loss associated with 426 restarts within less than two hours for the period May to October, 2010 – estimated at $19 million. This is probably an underestimate of the total efficiency loss because there may be strategic shutdowns of more than two hours.

# V. Strategic use of TRs combined with Intertie Offer Guarantees

- MSP 20 describes how a market participant “routinely offered imports in excess of the intertie transfer capability at the Minnesota interface causing import congestion in a large number of hours”
- Offering highly negative priced imports in excess of the Scheduling Limit at presents no financial risk to the participant.

# Some Speculative (and highly preliminary) Conclusions

- Many of the market features that seem most susceptible to gaming stem essentially from two shortcomings.
  - The two schedule pricing system that the MSP has questioned on many occasions and which is currently under review
  - A perceived need to reward generators and importers more than the expected wholesale market price.