Market Power Framework
for the IESO-Administered Market

Stakeholder Meeting on the MSP's
Proposed Framework

January 17, 2007

Overview

- MSP mandate & role of framework
- Concepts of market power in the framework
- MSP's market power framework
- Proposed implementation
- Consultation and next steps

Market Power Framework

MSP Mandate & Role of Framework

MSP Mandate

- Monitoring behaviour in the marketplace
  - look for 'gaming' and abuses of market power

- Investigating and recommending on
  - the behaviour of specific market participants
  - the design of the rules and operating procedures of the marketplace, and
  - the structure of the marketplace

- Reporting on the results of its monitoring

Market Power Framework

Role of Framework

- ## Supports monitoring for anomalous events
  - has the exercise of market power contributed to price spikes

- ## Withholding and pricing-up are not issues in and of themselves

- ## Persistent sustained exercise of market power
  - might be considered abusive and investigated

Market Power Framework

Regulated Prices and Contracts

- Original design had MPMA
  - reduced OPG incentive to exercise market power
  - rebate was 'sole remedy' for prices above $38/MWh
  - included plan to reduce OPG market share
- Replaced by regulated prices for OPG assets
  - For non-prescribed assets requirement to maximize value 'to the people of Ontario', subject to review by MSP
- Many other market participants have fixed price contracts with OPA
- However, almost any generation without fixed price could theoretically exercise market power
  - depending on supply conditions

Market Power Framework

Elsewhere

- Electricity markets lack some of the sources of discipline of competitive markets
  - relatively inelastic; not storable; lead-time for new entry
  - has led to market monitoring and mitigation in many markets

- Range of approaches to exercise of market power
  - price caps and possible sanctions [Alberta, Australia]
  - price caps and automatic mitigation procedures [AMP – US markets]
  - limited regular monitoring by other markets for exercise of market power with hydroelectric facilities

Market Power Framework

Concepts of Market Power in the Framework

Exercise of Market Power

- Market power
  - the incentive & ability to move market prices from the competitive level

- Framework focuses on
  - exercises of market power which increase the market price for energy
  - through withholding or pricing-up

- To conclude an exercise of market power
  - market participant profits from the event, and
  - there is no persuasive alternative rationale

Market Power Framework

Withholding

- Restriction of available inframarginal supply
  - economic withholding
    - offering supply at prices higher than MCP
  - physical withholding
    - not offering some portion of available supply
    - declaring unnecessary forced outage
- Both lead to inefficiency and wealth transfers
  - a higher cost resource is selected
  - market price increases

Market Power Framework

Market Power Framework

Pricing up

For the marginal supplier

- offering supply at prices higher than cost

- Leads to wealth transfer but not necessarily inefficiency
  - market price increases
  - no change in resources selected
- Can occur since demand is inelastic to price over large ranges of price.

Economic Withholding

Price

Demand

G3

G1

G2

MCP

Dispatch

Quantity
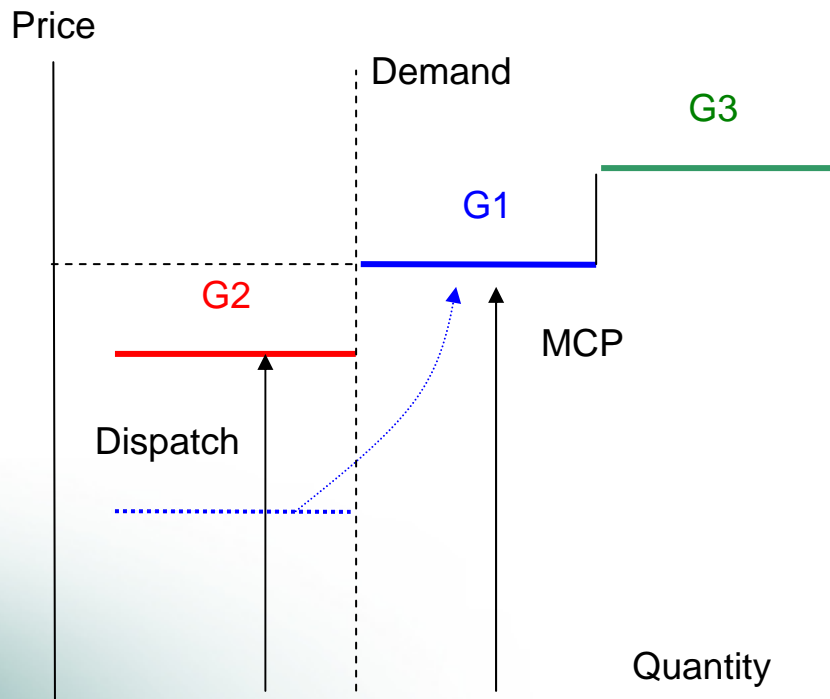
- Lowest cost generator G1 increases price above G2.
- G2 is dispatched instead to meet demand
- G1 is now next higher offer price and sets MCP
- Dispatch is inefficient, using G2 instead of G1
- MCP is higher, set by price of G1 rather than price (cost) of G2
- If Generator 1 has other dispatched generators in its portfolio so that it profits from the higher MCP, this is

likely an exercise of market power

Market Power Framework

Pricing-Up
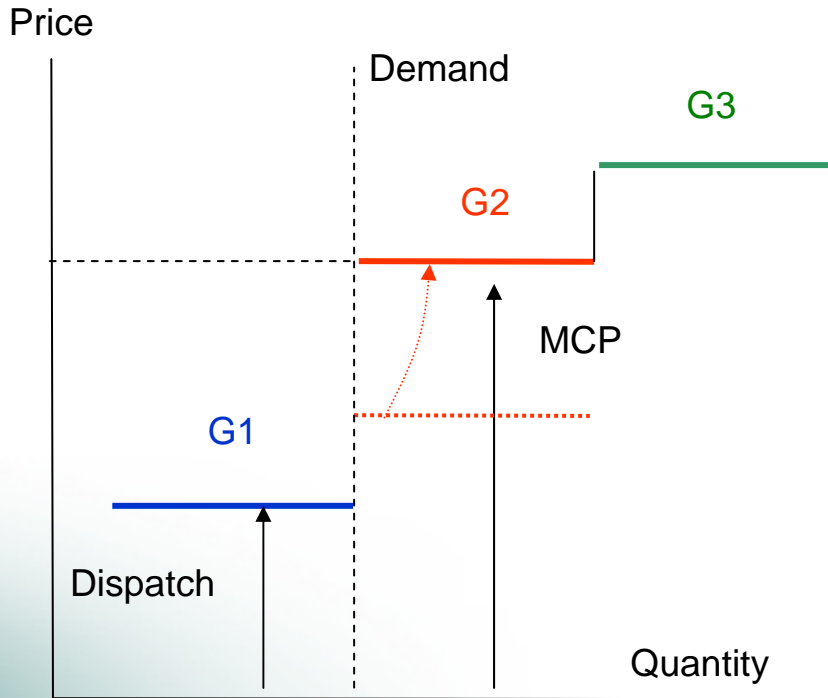
- Generator G2 increases its offer price.
- There is no change to the dispatch.
- There is an increase in the MCP.
- If Generator 2 has other dispatched generators in its portfolio, this is

likely an exercise of market power

Market Power Framework

Market Power and Scarcity

Scarcity conditions
- when available resources are barely adequate to meet demand

- Market price tends to be high
  - may be set by dispatchable load bid
  - Price is mechanism for rationing scarce supply

- Scarcity also increases opportunity to exercise market power
  - even for small suppliers
  - effects of true scarcity may be aggravated by exercise of market power

Market Power Framework

MSP's Market Power Framework

Necessary (and Sufficient) Conditions

Offer exceeds/sets MCP & supply should be inframarginal

$$\text{Offer Price}(Q) \geq \text{MCP}$$
$$> \text{Max}\,[MC(Q),\, AIC(Q)]$$

Market participant profit is higher as a result

$$\prod(Q^A) > \prod(Q^C)$$

Presumption of an exercise of market power subject to explanation by market participant

Market Power Framework

Three Operational Tests
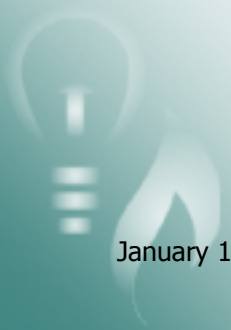
Participant Conduct Test

- offered at 'extraordinarily' high prices or not offered

Material Price Impact Test

- offer raised market price substantially

Profitability Test

- participant profits are higher due to pricing strategy

Market Power Framework

Application and Exceptions

- Specific tests tailored to characteristics of 3 types of supply
  - Non-energy limited generation (thermal)
  - Imports
  - Energy-limited generation (hydroelectric)

- Exceptions
  - MCP for hour below $50 per MWh
  - economic withholding for nuclear units
  - NUGs or other generation with entire portfolio at fixed prices

Market Power Framework

Proposed Implementation

Non Energy-Limited Generation

Conduct Test to establish if either

- Pricing is unusually high
  - based on offer history: average plus margin
    - 90 day averages for 10 MW laminations adjusted for fuel price changes
    - plus a statistical margin (2 standard deviations)
  - maximum production costs
    - at minimum production level
    - using production cost curve and start-up costs

- Supply is not offered or is forced out
  - Unit and portfolio tests

Non Energy-Limited Generation (cont)

Market Price Test

- For unit or units triggering the conduct test, replace offers and simulate new HOEP for the hour
  - Using reference prices (fuel-price adjusted historical offers) or marginal cost
  - Simulation covers both pre-dispatch and real-time
- Is competitive price substantially lower ($50 or 50%)

Profit Test

- Comparing profit (energy price or payment less production cost)
  - for actual vs. simulated competitive price and schedules
- Accounting for participant's entire portfolio
  - recognizing supply with fixed prices

Market Power Framework

Imports

Conduct Test

- to establish if offer is unusually high

- based on 1 year history at an intertie

  - hourly ratios of all participant offers to the highest price in neighbouring markets

    - Assumes stable relationship

    - Data showed statistical significance for 50 MW laminations

- Offer > Reference Offer Price + 2 Stand. Dev.'s

  - Reference Offer Price = average based on history

- Offer Price ≥ Pre-Dispatch Price

     > Reference Offer Price

Market Power Framework

Imports (cont)

Market Price Test

- For all participant offers triggering the conduct test
  - replace offers and simulate new <u>pre-dispatch</u> market price
  - Revised Offer = average historical ratio * highest external price
- Is competitive PD price substantially lower ($50 or 50%)

Profit Test

- Has profit increased for actual vs. "competitive" conditions
  - Recognizing importer paid the higher of HOEP or offer
  - May be inferred from PD conditions and changes
- Based on participant's imports
  - unless generation also triggered conduct tests

Market Power Framework

Energy-Limited Generation

Conduct Test to establish if

- water has been inefficiently allocated into low-priced hours
  - recognizing there are many restrictions on hydro production

- Create ratio of actual revenue for water to ideal revenue for each day
  - assuming perfect foresight and no production restrictions

- Test compares current day's ratio with historical daily ratios

Market Power Framework

Energy-Limited Generation (cont)

Steps: Determine / Calculate

    i)   Amount of Energy Available for Scheduling

    ii)   Maximum Daily Revenue Possible

    iii)   Daily Revenue for the Actual Schedule

    iv)   Daily Water Allocation Efficiency Ratio

    v)   Is the Current Daily Ratio Below a Threshold Based on Past Performance

    vi)   Consider Other Factors

Market Power Framework

Energy-Limited Generation (cont)

Market Price Test
- Create revised schedules "consistent" with history
  - Target revenue = Day's Ideal Revenue * Average ratio
  - Revised Schedules minimize the change
- Simulation with revised schedules in PD & real-time
- Test applied to all hours, netting price increases and decreases weighted by hourly market demand

$$\sum_h w_h.(HOEP_h - PE_h{}^c) > n.\$50/MWh \qquad \text{n= 2 or 3}$$

Profit Test

$$\sum_h (\Pi_h{}^W - \Pi_h{}^C) > 0$$

- applied to participant's entire portfolio

Market Power Framework

Consultation and Next steps

Consultation - Next steps

- Discussion paper published Dec 1, 2006
- Written stakeholder comments, due Feb 28, 2007
  - Including response to questions posed
- MSP review of comments and initial response
- Development of options and possible further consultation
- Finalize and publish Framework
- Begin the process to modify Data Catalogue

Market Power Framework