

Issue #40 – Locational Pricing for Intertie Transactions

Market Pricing Working Group Meeting #51
19 Aug 08



Agenda

- Existing Pricing for Intertie Transactions
- Issue Description
- Strawman Pricing Design
- Next Step

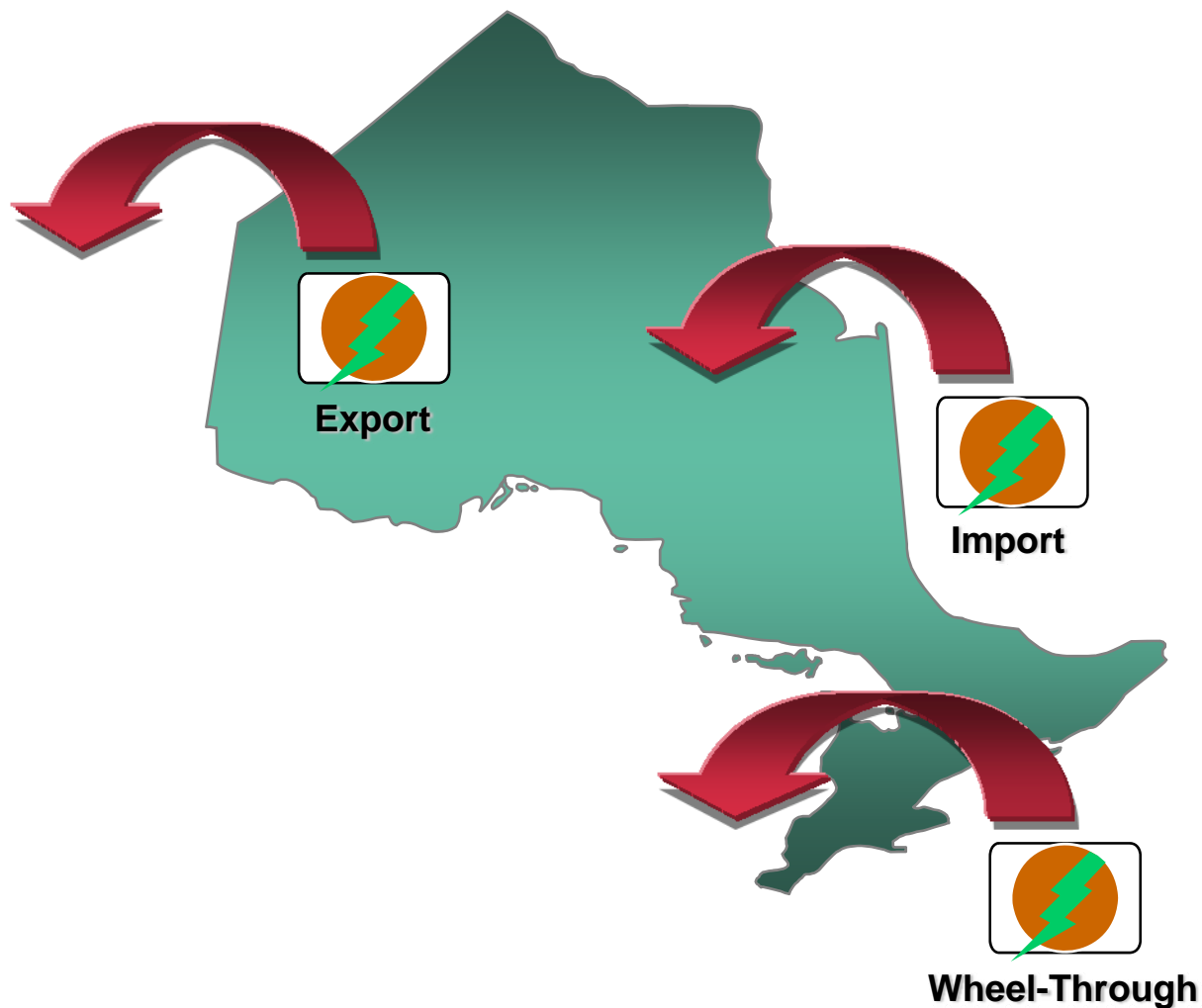
Existing Pricing for Intertie Transactions



Ontario Interconnections



Types of Interjurisdictional Trade



Interjurisdictional Trade

Similar to trade inside Ontario:

- Everyone must bid and offer to be scheduled
- Scheduling is independent of any contracts
- Scheduling based on economics and ability to transmit the energy
- No need to arrange transmission rights inside Ontario
- Most uplifts apply to exports

Interjurisdictional Trade

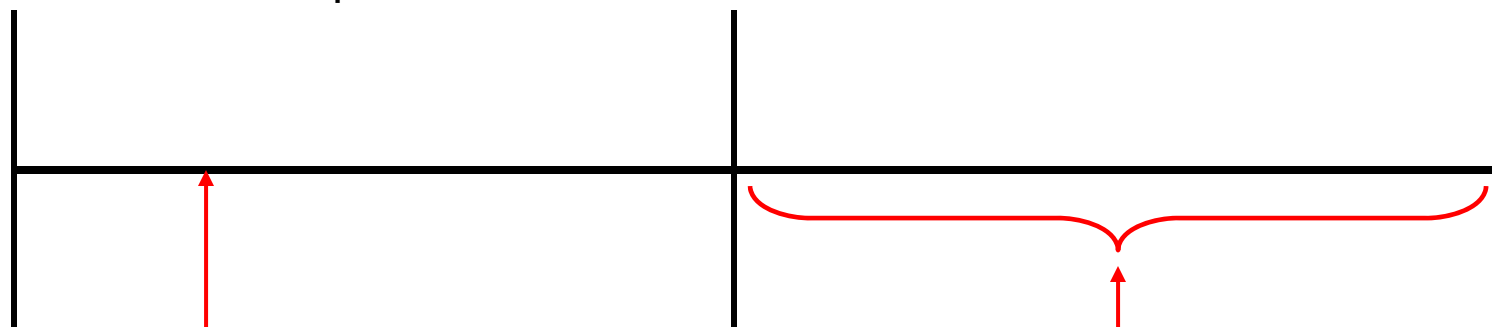
Unique features:

- Prices are determined for each zone
- Transactions are scheduled hourly and in advance of the start of the hour
- Must supply NERC tag
- Participant must navigate other jurisdictions to successfully complete their transactions
- Must have a valid National Energy Board (NEB) authorization to export energy outside Canada

Intertie Transaction Timing

Last
Pre-Dispatch Hour

Dispatch Hour



Treated as dispatchable up to and including the last pre-dispatch run before the start of the dispatch hour:

- Compete with dispatchable Ontario supply/load to be scheduled
- Competes on basis of “as offered” and “as bid” price
- Can set projected price

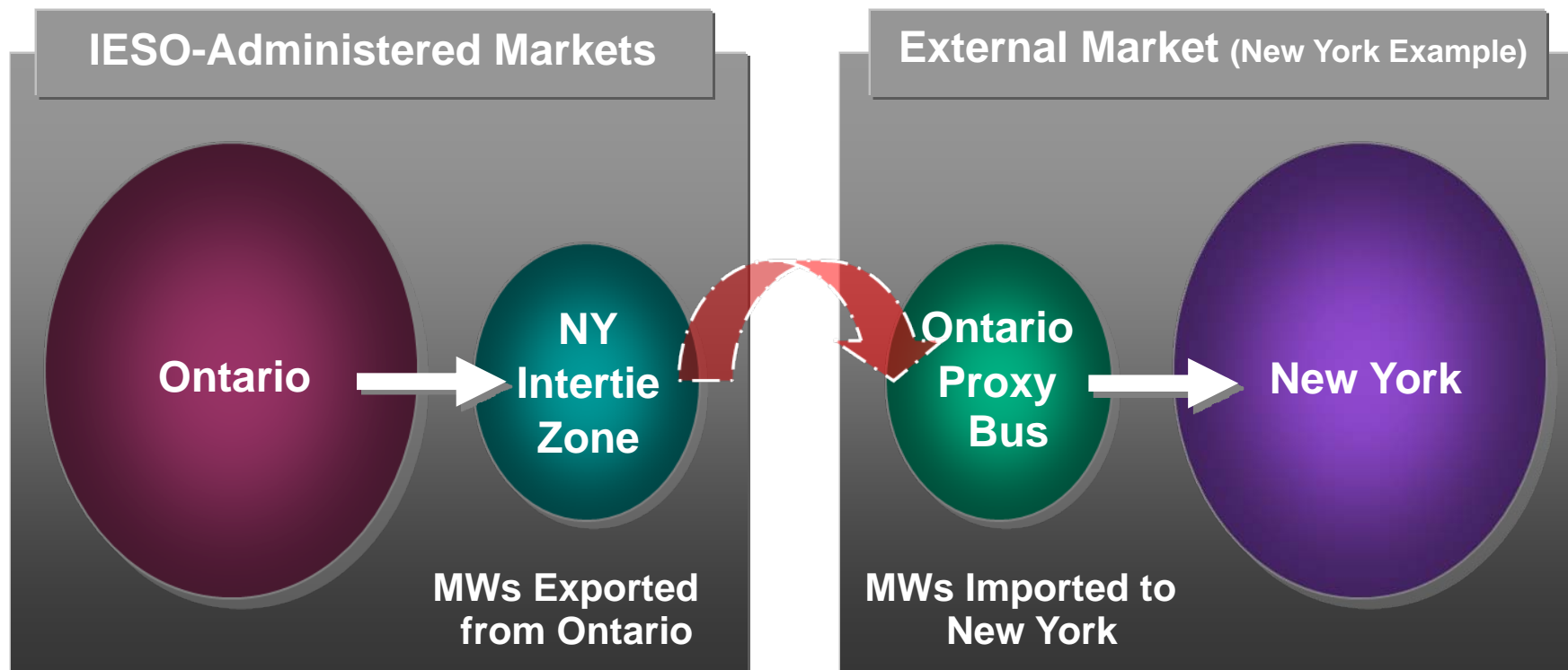
Treated as non-dispatchable during the dispatch hour:

- Locked in for the hour
- Dispatch algorithm assumes:
 - Imports offered at $-\$2000$ (-MMCP)
 - Exports bid at $+\$2000$ (MMCP)
- Flows regardless of real-time price

Zonal Pricing

- When we refer to “the price in the zone”, we are *not* referring to the actual price of energy in the other jurisdiction (New York, Michigan, etc.)
- “The price in the zone” is an IESO price:
 - It is set based on offers and bids submitted in the IESO-administered market
 - The actual price of energy in the other jurisdiction has no direct effect on the calculation of price used to settle transactions in the zone

Exports



Transfer of MWs from one market to the other is achieved when both markets are navigated successfully

Pricing in the Intertie Zones

- Imports and exports are settled at the applicable intertie zone price:
 - Exports are charged the price of the zone to which they are exporting and imports are paid the price of the zone from which they are importing; e.g.:
 - Price in the Ontario zone is \$25/MWh
 - Price in the Michigan zone is \$35/MWh
 - Exports from the Michigan zone are charged \$35/MWh
 - Imports from the Michigan zone are paid \$35/MWh

Different Prices Are Possible

- The pre-dispatch unconstrained run (which determines prices and market schedules) considers intertie limits
 - It will only use bids/offers in the intertie zone to the extent that the intertie can physically handle the transactions
- Therefore, each intertie zone can have a price that is different than the Ontario energy market price
 - Price differences are caused by congestion (i.e., by having more energy that is economic trying to enter/leave the intertie zone than the intertie can physically handle)

Intertie Zone Prices Summary

- Imports and exports are settled at the intertie zone price
 - This is the intertie congestion price based on the hour ahead pre-dispatch plus each 5-minute real-time price in Ontario
- Intertie zone prices different from Ontario prices indicate congestion on the intertie:
 - If the intertie price is lower than the Ontario price, it is import congested
 - If the intertie price is higher than the Ontario price, it is export congested

Settlement Price for Imports and Exports

Pre-dispatch
Unconstrained
Sequence

Projected Intertie
Zone Price

-

Projected Market Clearing
Price in Ontario

ICP (Intertie
Congestion Price)

Real-time
Unconstrained
Sequence

+

5-Min. Ontario Price

Intertie Zone MCP

Settlement Price for an Intertie Transaction (Interval 1)

Pre-dispatch

Projected Intertie
Zone Price = \$25

-

Projected Price in
Ontario = \$22

Intertie Congestion
Price = \$3

Real-time
Settlement

Intertie Congestion
Price = \$3

+

Interval 1: 5-minute
Ontario Price = \$23

Intertie Zone Price = \$26

Issue Description

Issue 40: Locational Marginal Pricing (LMP) for Intertie Transactions



LMP for Intertie Transactions

History

- Market Surveillance Panel (MSP) has identified inefficiencies associated with current method of scheduling and settling intertie transactions
- Ontario's uniform pricing model identified as a contributing factor to identified inefficiencies
- LMP for intertie transactions identified as possible solution to mitigate these inefficiencies

LMP for Intertie Transactions

Basic Idea

- Schedule and settle intertie transactions on the basis of Locational Prices
 - Locational prices would take into account transmission constraints, losses and resource ramp rates
 - Locational prices would be calculated for each of the 13 interconnections between Ontario and its neighbours
 - Generators and consumers in Ontario would continue to be settled on the basis of Ontario's uniform price

LMP for Intertie Transactions

Issues for Consideration

LMP for Intertie Transactions expected to impact the following market elements:

- Determining representative locational marginal prices for interties
- Market Clearing Price (MCP)
- Efficiency changes/implications and wealth reallocations – resulting from potential differences between intertie locational prices and Ontario's uniform MCP
- Intertie Offer Guarantee (IOG)
- Congestion Management Settlements Credits (CMSC)
- Transmission Rights (TR) market
- Wheel-through Transactions

LMP for Intertie Transactions

Representative Locational Marginal Prices for Interties

- Representative locational prices are required in advance, to conduct efficiency analysis and analysis on impacts to MCP, IOG, etc.
- Possible solution: Shadow prices that are calculated for each of the 13 interconnection points
- Issues identified with using current shadow prices (see page 3, [LMP for Interties – Issue Description Paper](#))
- Strawman Pricing Design

Strawman Pricing Design



Elements of Pricing Design - 1

- Intertie transactions scheduled and settled on basis of constrained sequences
- Pre-dispatch constrained sequence schedules 'copied' to pre-dispatch unconstrained sequence
- Hour ahead pre-dispatch constrained sequence schedules transferred to real-time constrained sequence
- Real-time constrained sequence schedules 'copied' to real-time unconstrained sequence

Elements of Pricing Design - 2

- How are settlement prices to be determined?
 - An Ontario real-time price + ICP?
 - Which Ontario real-time price should be used?
 - Shadow price of closest internal node?
 - Richview shadow price?
 - Other?
 - How should ICPs be determined?
 - Pre-dispatch constrained sequence?
 - Difference between the intertie zonal price and the Ontario price used for determining the above settlement price?

Next Steps



Next Steps

- Request MPWG written feedback on the issue paper and the strawman pricing design by 19 Sep 08:

iesomarketpricingworkinggroup@ieso.ca

- IESO to present pricing design (revised as required), proposed analysis and work plan and stakeholder engagement plan at MPWG meeting 29 Oct 08

Supplementary Slides – Intertie Zonal Pricing



Zone Prices – No Congestion



**NYA 100 MW
@\$15**



**NYB 50 MW
@\$22**



**NYC 75 MW
@\$30**

**250 MW
Limit**



**ONA 100 MW
@\$20**



**ONB 75 MW
@\$25**



**ONC 50 MW
@\$40**



ON Load 215 MW

**New York
Intertie Zone**

Ontario

Ontario Market Clearing Price – No Congestion

Offers available to meet demand

ONC: 50 MW @ \$40

NYC: 75 MW @ \$30

ONB: 75 MW @ \$25

NYB: 50 MW @ \$22

ONA: 100 MW @ \$20

NYA: 100 MW @ \$15

Ontario PD MCP =
\$22

ON Load 215 MW

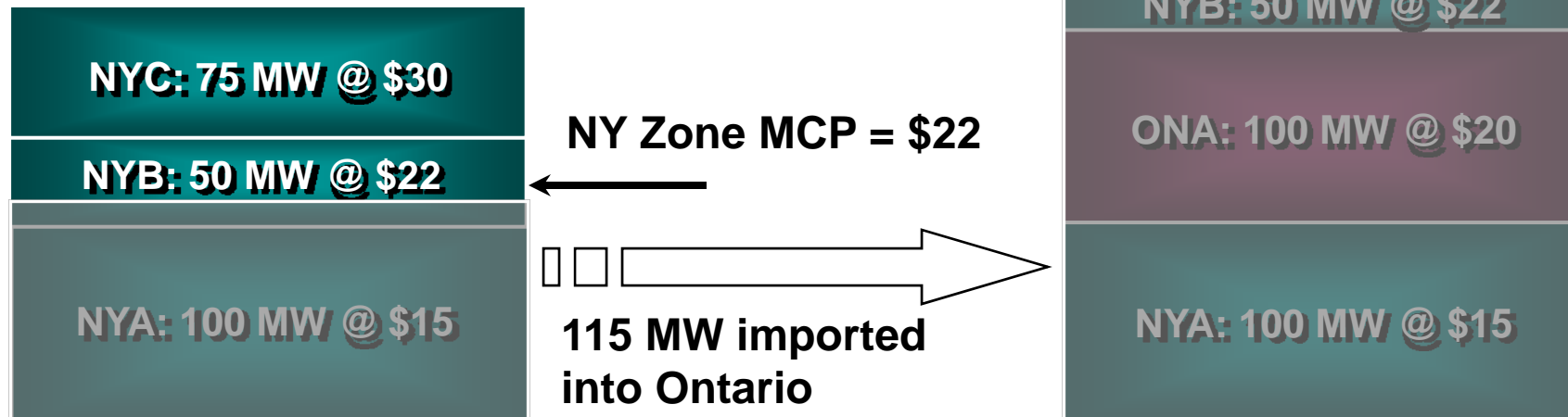
NY Zone Price – No Congestion

- The price in an intertie zone is determined by the cost of satisfying an additional increment of demand in the zone (easiest to think of as one more MW)
- This MW can be satisfied by energy from either an intertie zone transaction or a transaction in the Ontario zone, depending on what is most economic

New York Zone Price – No Congestion

How can we satisfy one additional MW of demand in the NY zone most economically?

**Offers from NY
intertie zone**



Ontario Market Clearing Price – No Congestion

Offers available to meet demand

ONC: 50 MW @ \$40

NYC: 75 MW @ \$30

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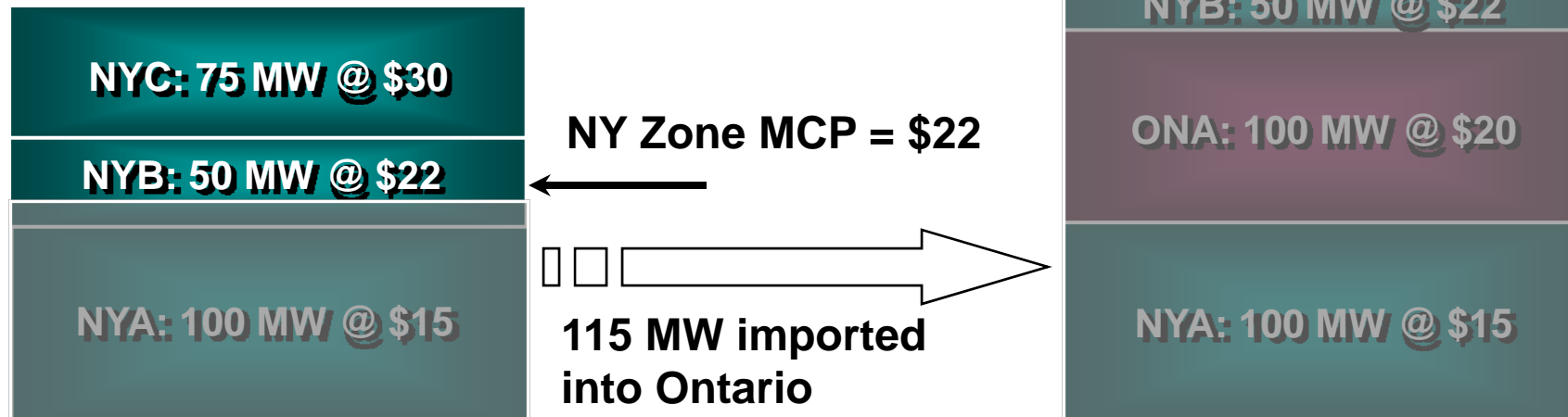
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**75 MW
Limit**



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@\$20**



**ONB 75 MW
@\$25**



**ONC 50 MW
@\$40**



ON Load 215 MW

**New York
Intertie Zone**

**What are the
ONZN and
NYIZ prices?**

Ontario

Ontario Zone Price – Congestion

Intertie Limit = 75 MW

**Offers from NY
intertie zone**



**Offers available to
meet demand**



Ontario MCP = \$25



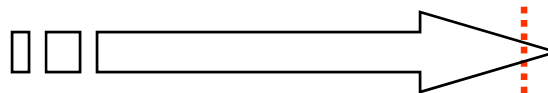
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**Offers from NY
intertie zone**



NY Zone MCP = \$15



**Offers available to
meet demand**

