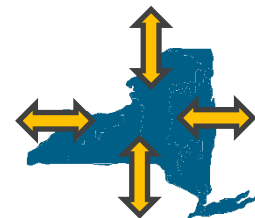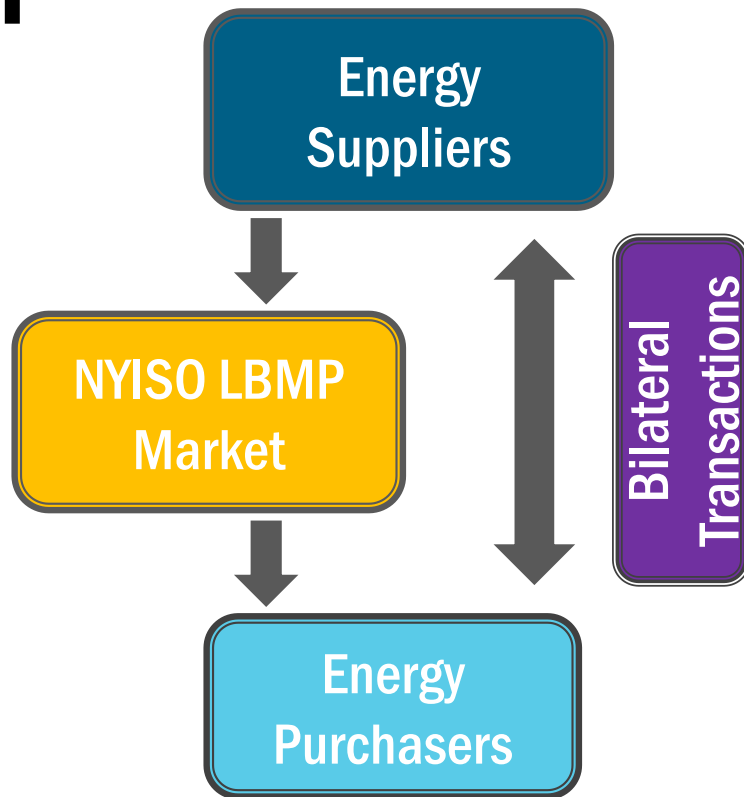# Energy Market Transactions

E – Learning Module

Energy Market Transactions

MODULE OBJECTIVES:

- Describe the purpose of Transactions

- Distinguish between the different types of transactions

- Identify source and sink points of transactions

- Describe how Transactions are evaluated

- Calculate the Settlement for Each Transaction Type

Transactions – An Introduction

New York ISO

Buying and Selling Wholesale Energy in NY

4

Energy Market Transactions

New York ISO

- **Why would an MP choose the Transaction option?**
  - Direct contract between supplier and purchaser with fixed long term price for energy
  - External supplier may get a better price for energy sold to NY than other control areas
  - Internal suppliers could get a better price for energy sold out of NY

- **Who can utilize the transaction scheduling option?**
  - Any MP (*e.g.,* Generators, Loads and 3rd party marketer/trader) can register to utilize transaction scheduling
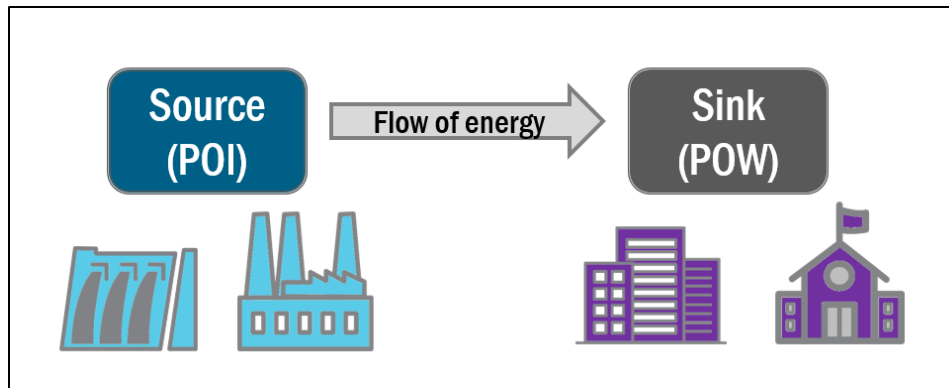
Transaction Terms

Source/Sink Points

NY Ref Bus-Marcy

External Proxy Bus

Financially Responsible Party

Source/Sink Points

- Source: Point of Injection (POI); where the power is coming from, *e.g.,* Generators

- Sink: Point of Withdrawal (POW); where the power is going to, *e.g.,* Loads

- Important role in distinguishing transactions

NY Reference Bus -Marcy

- NYISO point of reference for marginal cost of energy (Ref Bus LBMP) calculation

- Congestion and Losses are zero at this location

- Possible source / sink point

NYISO Reference Bus

Marcy

External Proxy Bus

- Location outside the NYCA that is selected by the ISO
  - to represent a Load or Gen bus in each of the adjacent Control Areas
- LBMP prices for external proxy buses are calculated with reference to the NY reference bus
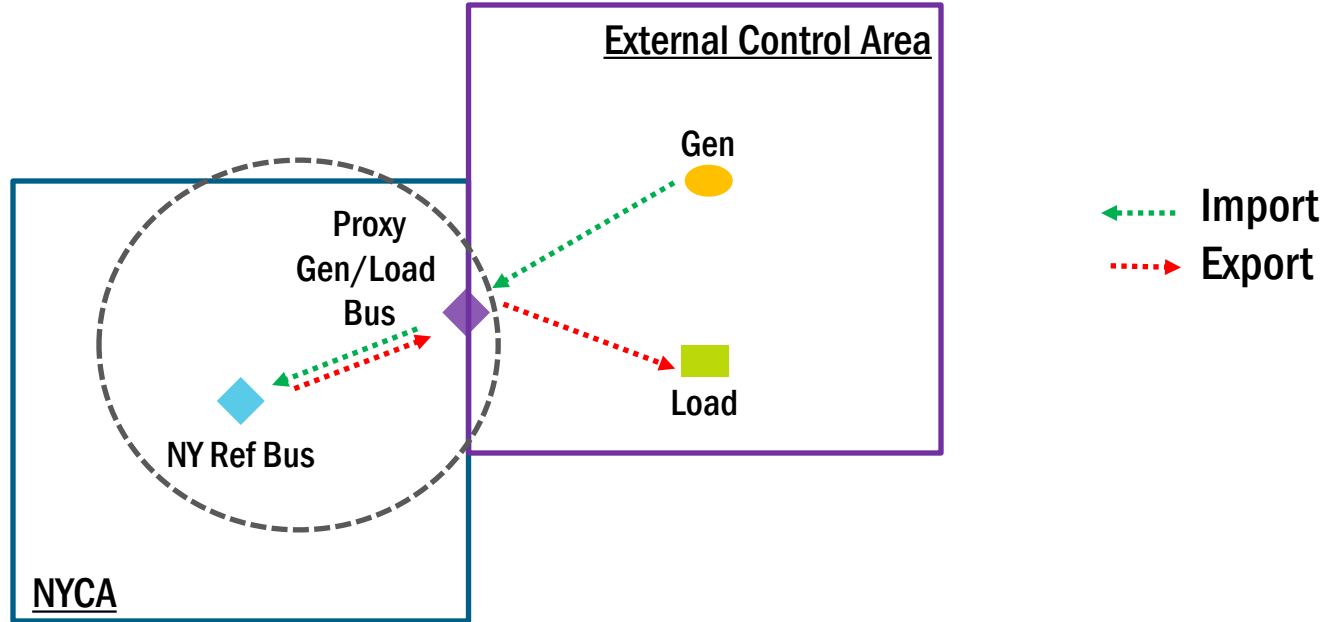- NYISO designated for PJM, HQ, IESO, and ISO-NE

New York ISO
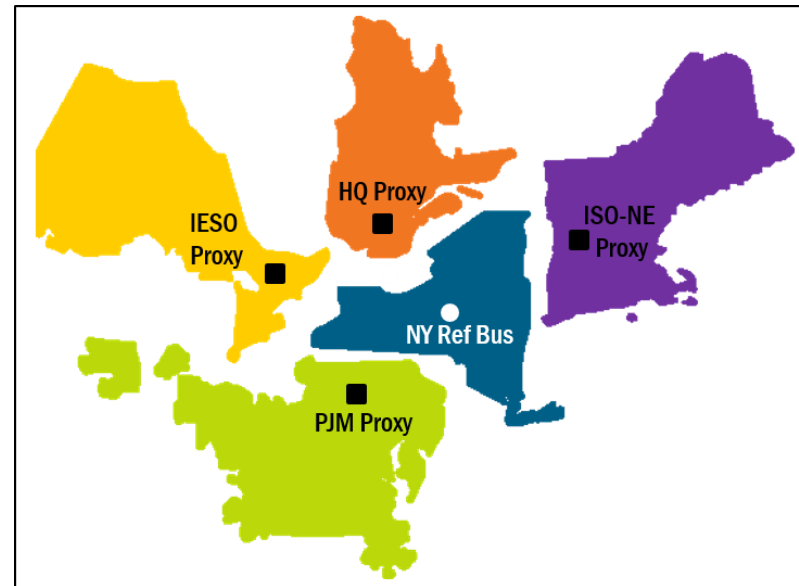
Financially Responsible Party

- The transaction contract owner

- The party initially creates the transaction contract in the MIS/JESS

- Financially responsible for the charges associated with the transactions

- Can be a source organization (gen), sink organization (load) or a third party (Marketer)
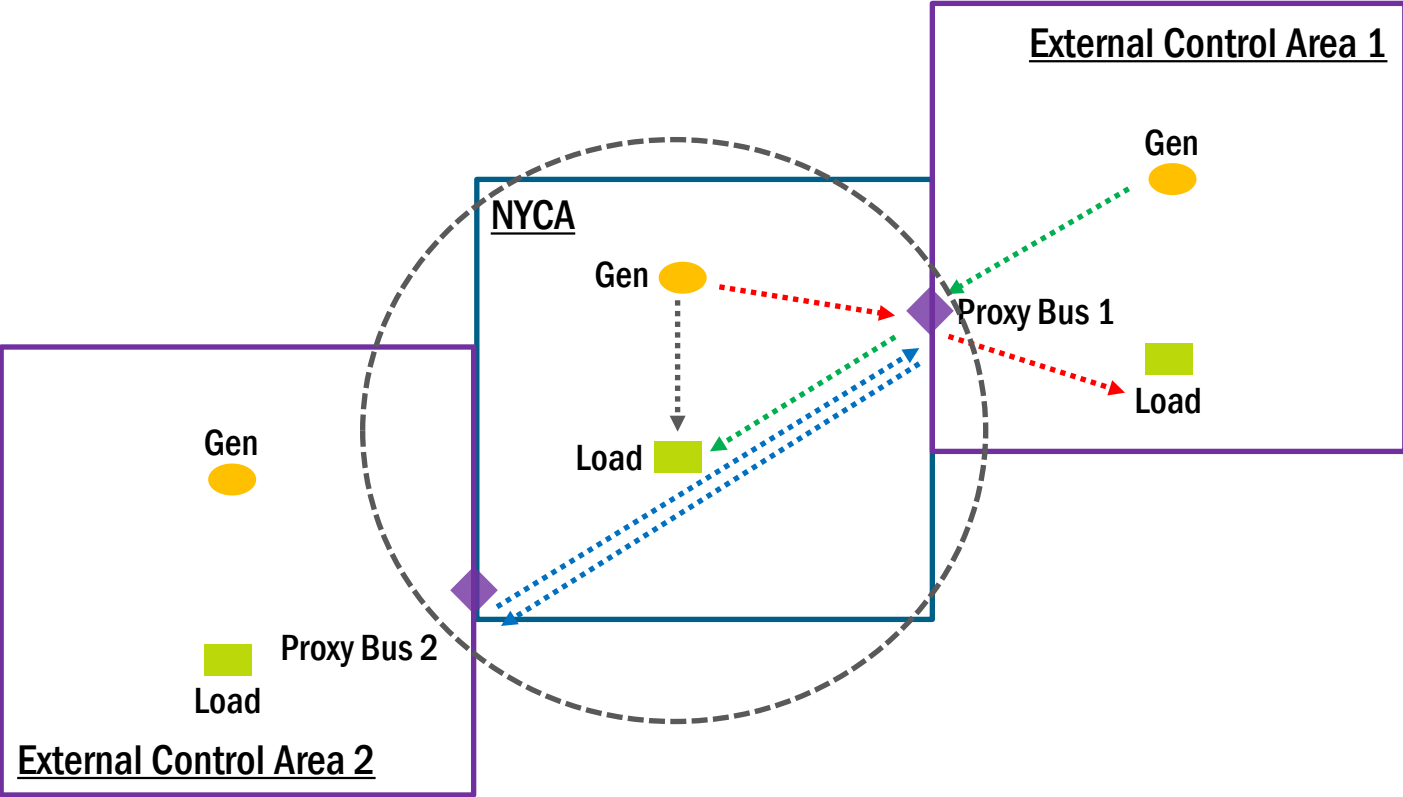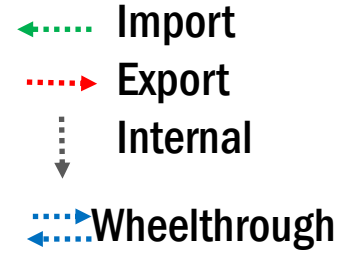
LBMP Transactions

LBMP Transactions

	Source or POI	Sink or POW
Import	External Proxy Gen Bus	NY Reference Bus
Export	NY Reference Bus	External Proxy Load Bus
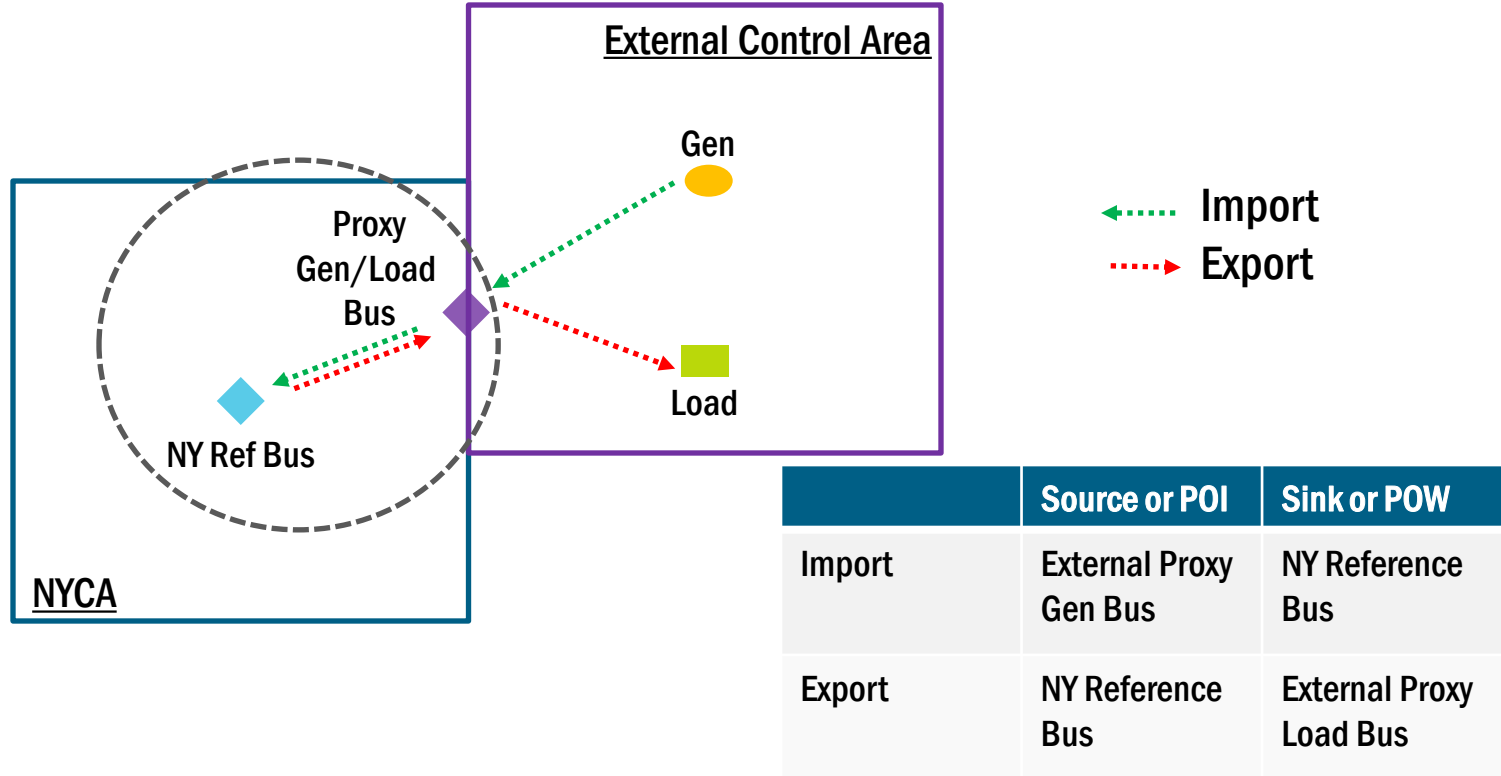
Bilateral Transactions

Bilateral Transactions
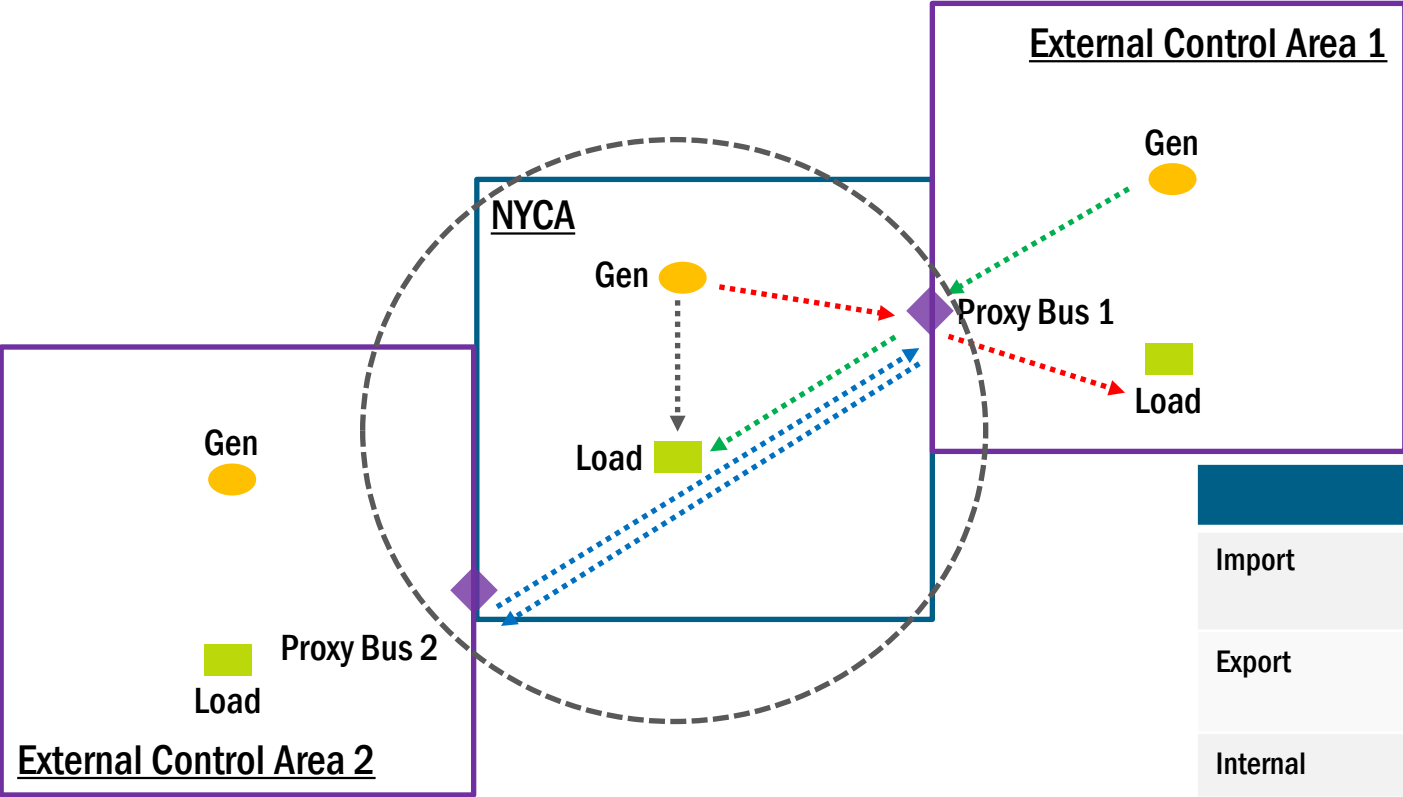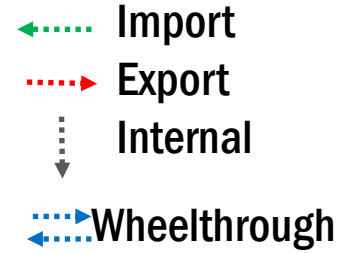
	Source or POI	Sink or POW
Import	External Proxy Gen Bus	NY Load Bus
Export	NY Gen Bus	External Proxy Load Bus
Internal	NY Gen Bus	NY Load Bus
Wheelthrough	External Proxy Gen Bus	External Proxy Load Bus

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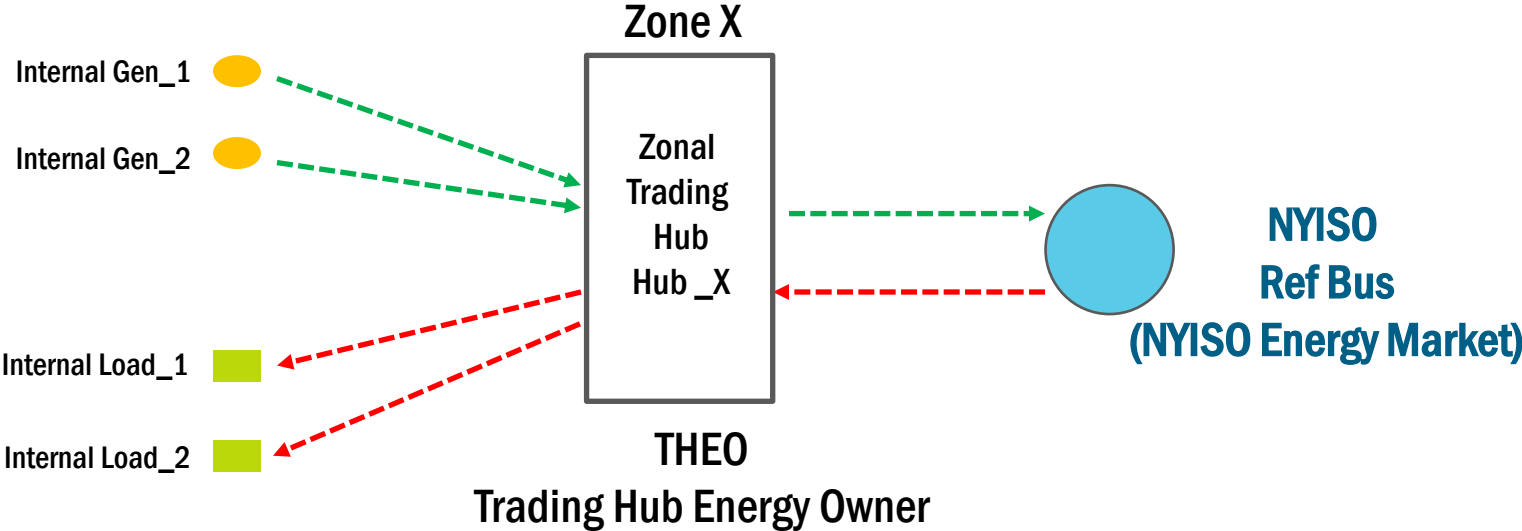# Transactions – Bids and Evaluations

New York ISO

Internal Bilateral Transactions

- Scheduled automatically regardless of economics
- Bid ($/MW) is not submitted
    - NYISO needs to be aware of MWs only
- Types

    - Gen Bus to Load Bus

    - Gen Hub to Load Bus ⎫
                          ⎬ Trading Hubs
    - Gen Bus to Load Hub ⎭

Trading Hubs – Internal Bilateral Transactions

- Trading Hub – a virtual location in a given Load Zone, modeled as a Generator bus or Load bus for scheduling internal bilateral transactions

- Trading Hub Energy Owner (THEO) – NYISO customer who, purchases/sells energy from/to the NYISO and in turn has a Bilateral contract with a load/gen
  - Responsible for paying the trading hub LBMP settlements

- Advantages of trading hubs: Market Accessibility

Trading Hubs - Illustration

External Transactions – Bids and Evaluations

External Import

LBMP

Bilateral

- Decremental Bid
- Coordinated Transaction Scheduling (CTS)

External Export

LBMP

Bilateral
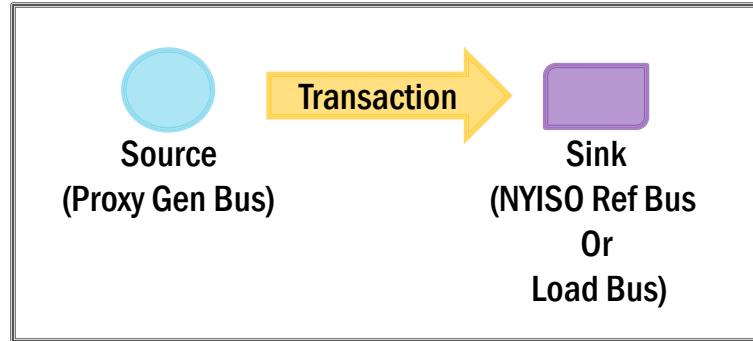
- Sink Price Cap Bid
- Coordinated Transaction Scheduling (CTS)

Wheelthrough

- Congestion Cost Bid

Import - Decremental Bid Evaluation

- Bid = $ / MW using up to a 11-point Bid curve

- Bid signifies: Minimum price MP is willing to be paid for energy (MP is willing to accept no less than Bid price)

- <u>Bid evaluated as an external gen bid, against the Proxy (Source) LBMP</u>

Export - Sink Price Cap Bid Evaluation

Source (NYISO Ref Bus Or Gen Bus) → Transaction → Sink (Proxy Load Bus)
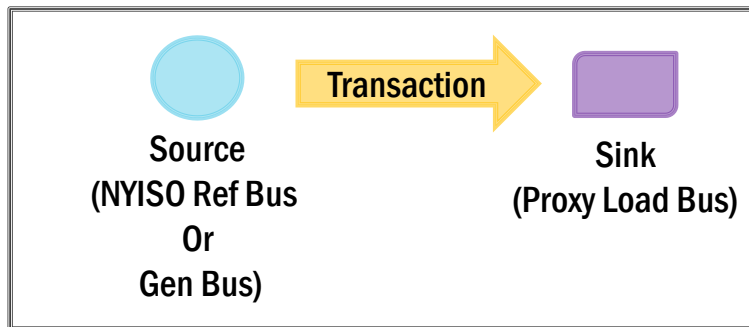
- Bid = $ /MW using up to a 11 pt. Bid Curve
- Bid signifies: Maximum MP is willing to pay for the energy (MP is willing to pay no more than Bid price)
- Bid evaluated as an external load bid, against the Proxy (Sink) LBMP

Coordinated Transaction Scheduling

- Mechanism to bid RT external transactions at CTS enabled interfaces

- Applicable to certain NY-PJM and NY-ISO-NE transactions

- Only available in the Real-Time Market

- Applicable for Imports and Exports

- Bids represent the spread or difference between the NYISO and
   PJM/ISO-NE forecasted Proxy Bus prices

Coordinated Transaction Scheduling - Illustration

Traditional Transaction Bid – Import:

Two bids entered for each leg of transaction

ISONE proxy for NY

Generator

Load

NY proxy for ISONE
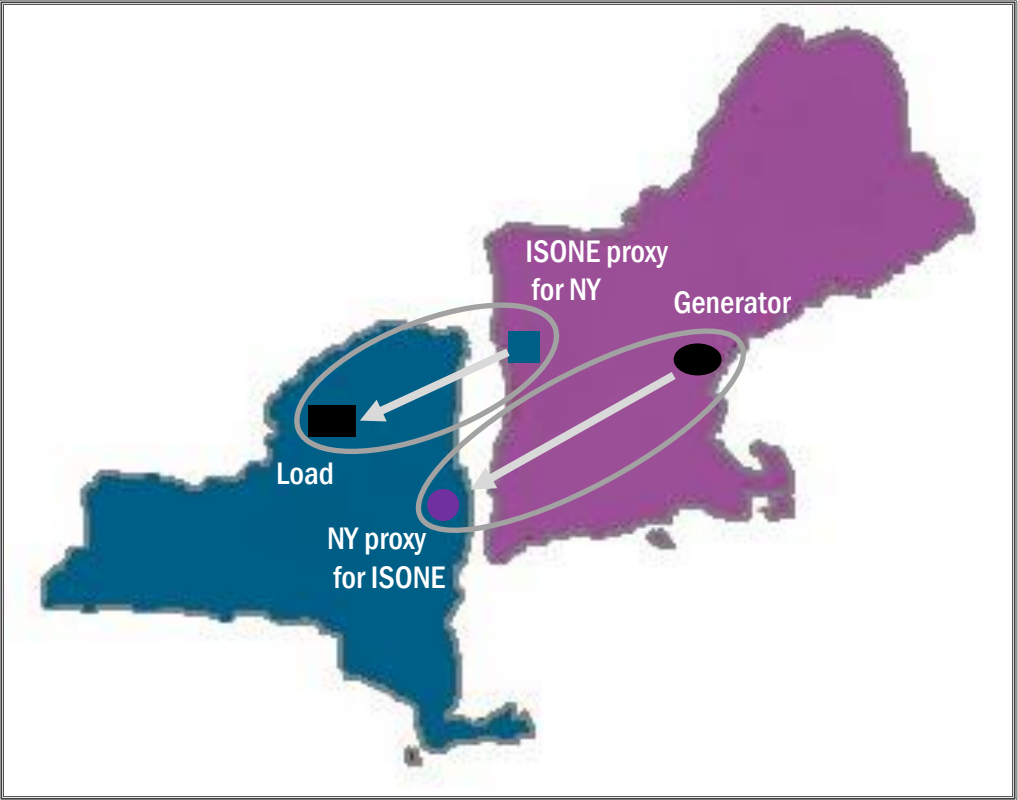
Coordinated Transaction Scheduling - Illustration

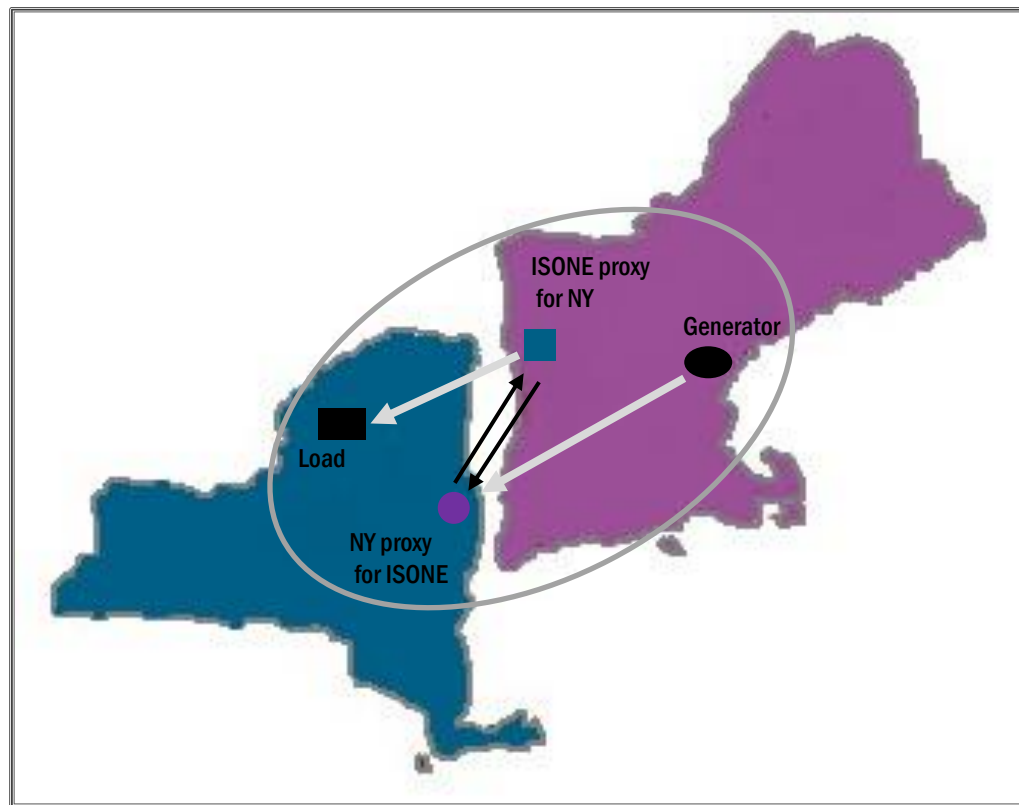Coordinated Transaction Scheduling Bid – Import:

NYISO calculates forecast price for ■
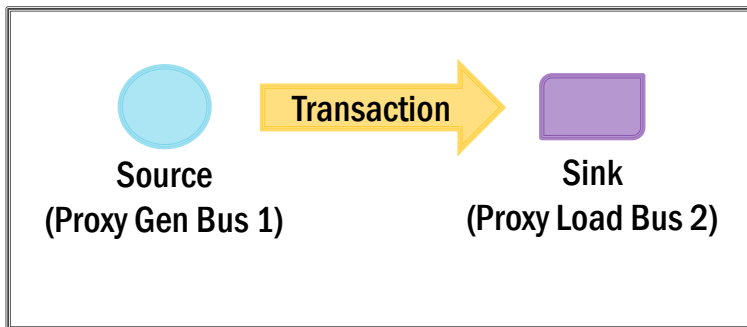
ISONE calculates forecast price for ●

CTS Import Bid compared to delta between the two forecast prices (dependent on direction of flow)

Only one bid entered for whole transaction

CTS Export Bids evaluated similar to Import Bids

Wheel-through Bilateral Transactions

Transaction

Source
(Proxy Gen Bus 1)

Sink
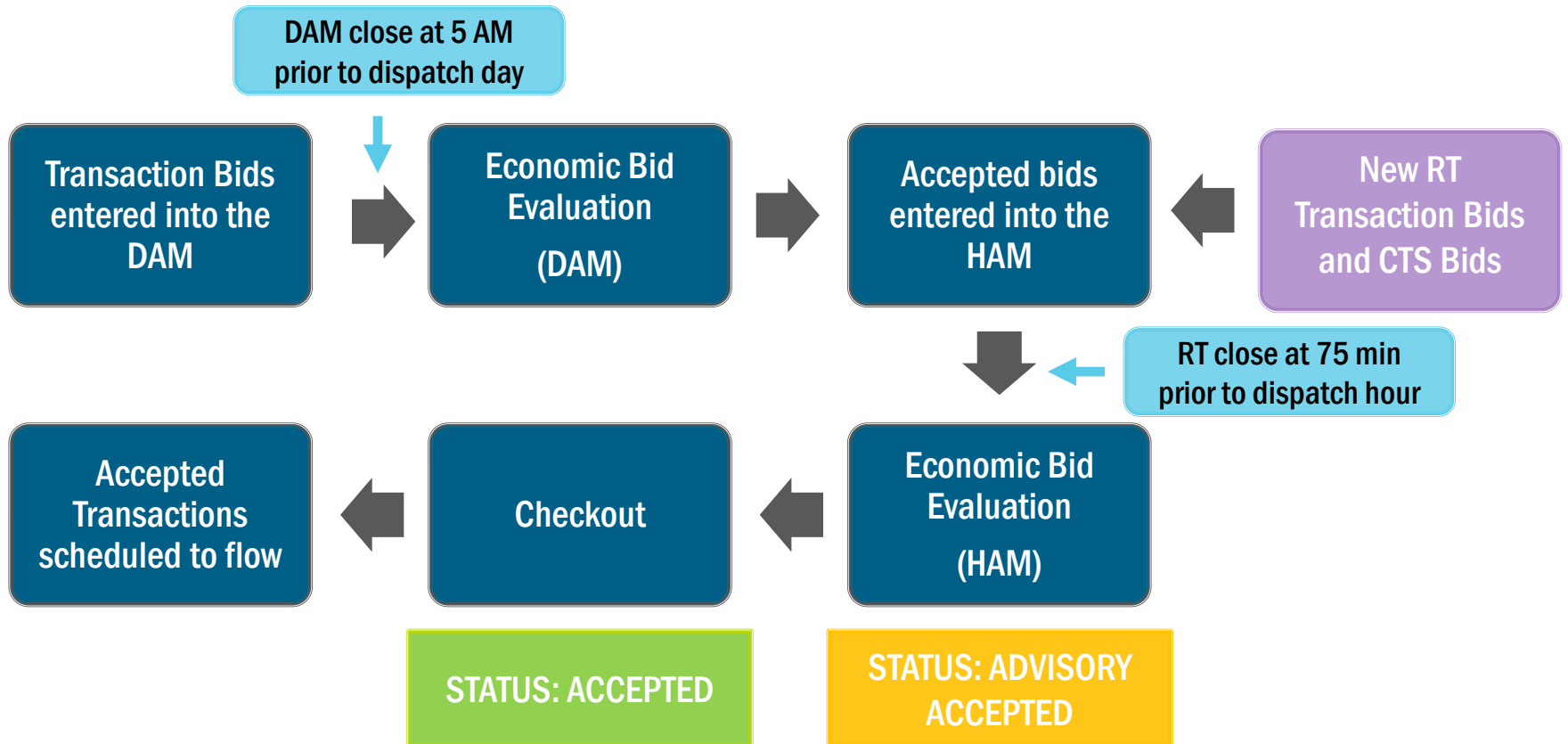(Proxy Load Bus 2)

- Bid = $ / MW using up to a 11-point Bid curve

- Bid is evaluated against the Congestion Cost of the transaction

- Congestion Cost is difference between congestion at the Sink and the congestion at the Source

Congestion Cost = Congestion at Proxy (Sink) LBMP – Congestion at Proxy (Source) LBMP

Transaction Scheduling – Process Flow

New York ISO

DAM close at 5 AM prior to dispatch day

| Transaction Bids entered into the DAM | → | Economic Bid Evaluation (DAM) | → | Accepted bids entered into the HAM | ← | New RT Transaction Bids and CTS Bids |

RT close at 75 min prior to dispatch hour

| Accepted Transactions scheduled to flow | ← | Checkout | ← | Economic Bid Evaluation (HAM) |

STATUS: ACCEPTED

STATUS: ADVISORY ACCEPTED

Transactions - Settlements

New York ISO

Transaction Settlements

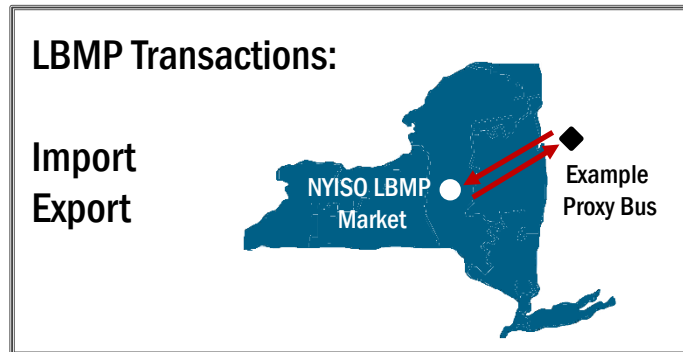**LBMP**

-Import

-Export

- Proxy LBMP($/MW)*MWs

Bilateral

-Internal

-External

- Transmission Usage Charge (TUC)
- Energy price negotiated directly

Settlement of LBMP Transactions

- Purchasing or selling energy at the external proxy LBMP

- For both Imports and Exports:

LBMP Transactions:

Import
Export

NYISO LBMP Market

Example Proxy Bus

Day Ahead Market (DAM) Settlement =

| DAM LBMP (Proxy Bus) x DAM MWh |

(DAM LBMP = hourly price)
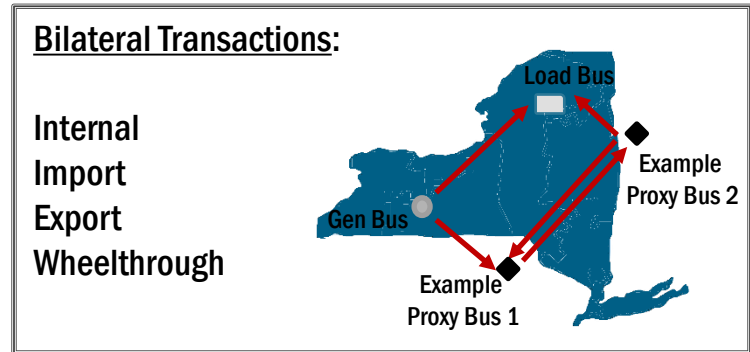
Balancing Market or Real Time Market (RT) Settlement =

| RTD LBMP (proxy bus) x RT MWh |

(RTD LBMP = ~ 5 min level interval price; interval settlements summed up to the hourly level)
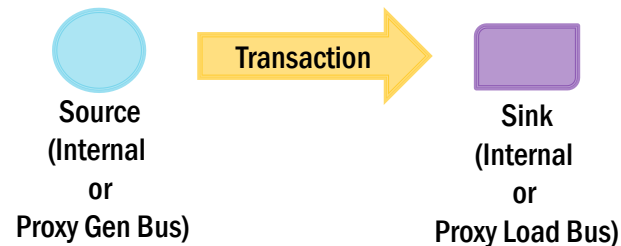
Settlement of Bilateral Transactions

- Transmission Usage Charge (TUC) is the cost of moving the power from source to sink

- Component of LBMP

Bilateral Transactions:

Internal
Import
Export
Wheelthrough

Load Bus

Example Proxy Bus 2

Gen Bus

Example Proxy Bus 1

LBMP = [Marginal Energy Price] + [(Loss) – (-Congestion)]

↓ NY Reference Bus Energy Price

↓ Transmission Usage Charge (TUC)

Source (Internal or Proxy Gen Bus)

Transaction

Sink (Internal or Proxy Load Bus)

For all Bilateral Transactions:

$$TUC = [Sink\ LBMP\ (\$/MW) - Source\ LBMP\ (\$/MW)] * MWs$$

Transaction Settlements - Summary

- **Imports (injections) – are typically paid**
  - LBMP Transactions: Energy, Loss and Congestion

- **Exports (withdrawals) – are typically charged**
  - LBMP Transactions: Energy, Loss and Congestion

- **Bilateral Transactions: Transmission Usage Charge – typically assessed to the Transaction owner**
  - ($\triangle$ Loss and Congestion)

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Additional Resources

- Tariffs - MST and OATT

- Market Participants User's Guide

- Joint Energy Scheduling System User's Guide

- Accounting and Billing Manual

- Transmission and Dispatching Operations Manual

- Technical Bulletins

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Questions?

For any future assistance, please contact NYISO Stakeholder Services at stakeholder_services@nyiso.com or by phone at (518) 356-6060

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