

Transactions on Scheduled Lines

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Summer 2013

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Training Objectives

1. Define terms relevant to transactions over Scheduled Lines and Designated Scheduled Lines.
2. Know requirements of other Control Areas that the NYISO Market Information System (MIS) must see (if applicable). Review the NYISO DA and RT timelines.
3. Understand NYISO Market mechanics and evaluation of transactions.

Training Objectives

4. Understand S.L. transaction settlements at a basic level.

5. Identify additional charges associated with S.L. transactions.

Terms

- ✓ **Scheduled Line (Dennison, Northport-Norwalk)**
- ✓ **Designated Scheduled Line
(Cross-Sound, HTP, Linden VFT, and Neptune)**
- ✓ **Advance Reservation**
- ✓ **Hourly v. Variably Scheduled Proxy Generator Bus**
- ✓ **Rolling RTC**
- ✓ **Special Pricing Rules**

Terms

- ✓ **Source / Sink Points**
- ✓ **NYISO Reference Bus**
- ✓ **Proxy Generator Bus**
- ✓ **Decremental Bid**
- ✓ **Sink Price Cap Bid**

Terms

- ✓ **RTC – Real Time Commitment (HAM)-**
 - *15 minute advisory-only prices*
 - *HAM transactions are scheduled based on RTC prices*
 - *External intra-hour bids are economically evaluated by RTC on a rolling 15-minute basis.*
 - *may be used to replace RTD price*

- ✓ **RTD – Real Time Dispatch (RT) –**
 - *~ 5 minute interval*
 - *used for RT settlements and balancing*
 - *HAM transactions are settled at the RTD price unless there are constraints (to be discussed later)*

The 6 Scheduled/Designated Scheduled Lines at a Glance

(After MST Section 4.4.4 Matrix)

Available Scheduling Frequencies

Proxy Generator Bus PROXY PRICING PT IN RED¹	Associated Scheduled Line	Designated Scheduled Line ²	Import to/ Export from NYCA	Non-Comp	Hourly	Variably	Dynamically
HQ_GEN_CEDARS_PROXY PTID 323590	Dennison		Import	X	X		
HQ_LOAD_CEDARS_PROXY PTID 355586	Dennison		Export	X	X		
PJM_GEN_NEPTUNE_PROXY PTID 323594	Neptune	X	Import only		X	X	
PJM_LOAD_NEPTUNE PTID 355615	Neptune	X			X	X	
PJM_GEN_VFT_PROXY PTID 323633	Linden VFT	X	Import		X	X	
PJM_LOAD_VFT_PROXY PTID 355723	Linden VFT	X	Export		X	X	
PJM_GEN_HTP_PROXY PTID 323702	HTP	X	Import only		X	X	
PJM_LOAD_HTP_PROXY PTID 355839	HTP	X			X	X	
NPX_GEN_CSC PTID 323557	Cross Sound	X	Import		X		
NPX_LOAD_CSC PTID 355535	Cross Sound	X	Export		X		
NPX_GEN_1385_PROXY PTID 323591	Northport Norwalk		Import		X		
NPX_LOAD_1385_PROXY PTID 355589	Northport Norwalk		Export		X		

¹Use **Gen Bus** for Proxy Bus Pricing, including Exports/TUC Sinks, and Wheel congestion \$ calculation; there is no separate pricing point posted in the MIS for the corresponding Load bus. But use the Load bus for Export and Wheel sinks in the MIS.

²Advance Reservation needed-85 Minute RT Scheduling Window (TB 223)

General Market Mechanics

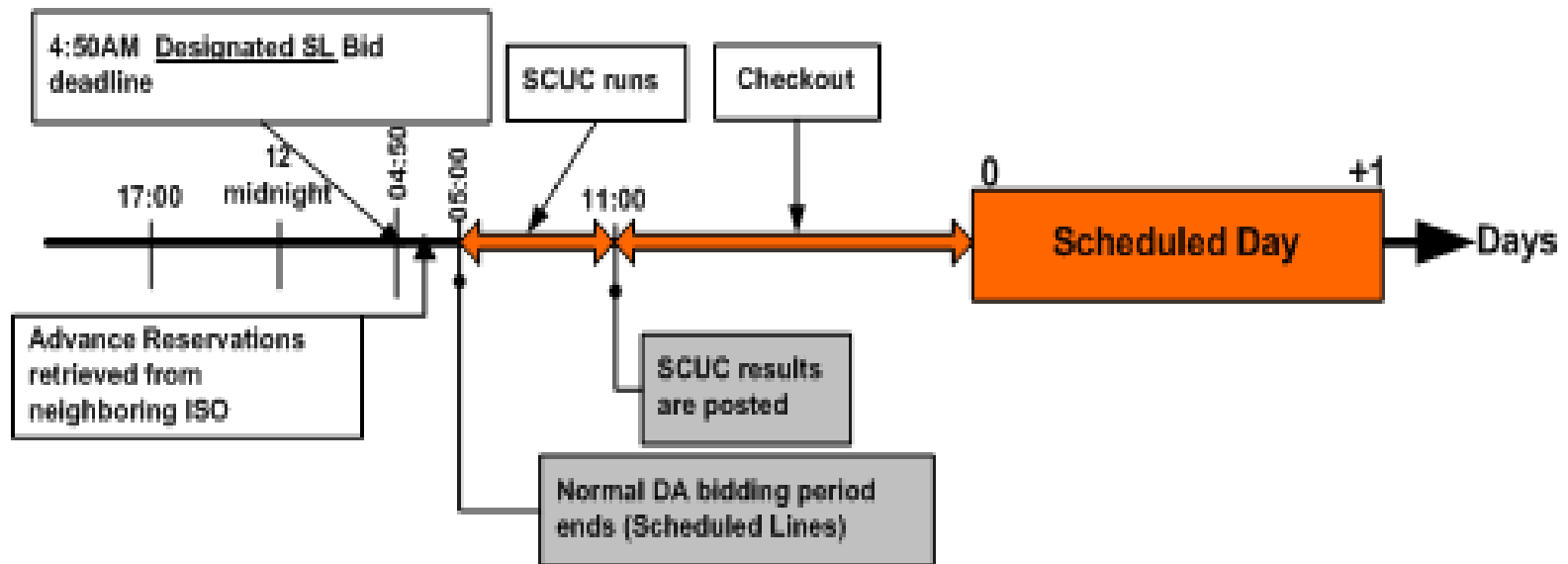


Market Mechanics

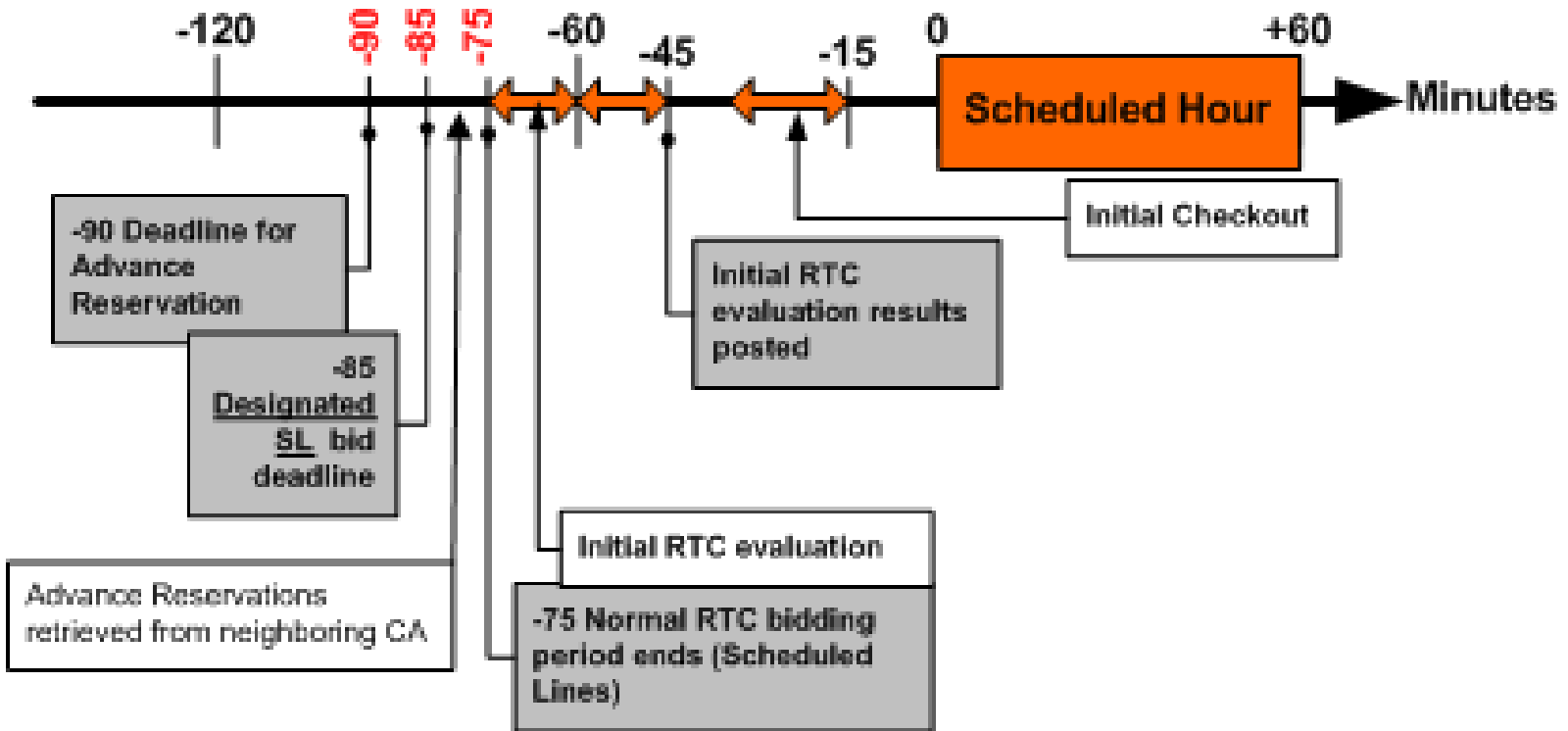
✓ Entering bids

- *Can be Firm or Non-Firm*
- *Single point to eleven point bid curve option*
- *For both DAM and RT transactions on Designated Scheduled Lines, an Advance Reservation of sufficient MW size must be obtained from the neighboring Control Area OASIS. There is also a requirement to schedule a transaction in the neighboring CA.*
- *A NERC Electronic Tag (E-tag) is required for a transaction that enters or exits the NYCA [External Transactions]. For Designated Scheduled Lines, the NYISO MIS bid must Identify a NERC E-Tag which includes a single Advance Reservation ID.*
- *See Market Services Tariff, Section 29.3 and Attachment N; also TB #27*

DAM timeline for Designated Scheduled Line Transactions



RT Market Timelines for Designated Scheduled Line Transactions



Market Mechanics

✓ Evaluation of Transactions

- *The evaluation of transaction bids is based on economics*
- *Evaluated in DAM Hourly and/or HAM-Hourly or Intra-hourly (15 minute) evaluations.*
- *Proxy Generator Buses are currently scheduled for a minimum of 1 hour, except:*
 - *Intra-hourly(15 minute) scheduling option for Linden VFT, Neptune, and HTP Transactions-web or upload/download (Bid Schedule Type); as well as HQ and PJM interfaces*
 - *Schedule can be 0 MW for any 15m interval(s)*
- *Control Areas must coordinate (Checkout)*
 - *Physical evaluation*

Ref: MST Section 4.4.4 Matrix

Market Mechanics and:

- ✓ Bid Messages and Timeline
- ✓ NERC E-tags

MIS Bid Statuses - Validation

✓ *WAITING CONFIRMATION*

- *All parties must confirm (Source, Sink and FRP)*

✓ *VALIDATION FAILED*

- *Improperly entered*
- *Insufficient Advance Reservation*

✓ *VALIDATION PASSED*

- *Properly entered and Confirmed by all parties*
- *TB 223-this status doesn't guarantee that the E-Tag is Valid, or that the Reservation is sufficient to support the bid.*

**See Tech Bulletin 178 for more details*

MIS Bid Statuses - Evaluation

✓ *EVALUATING*

- *Relevant software system is currently processing bid*

Then either

✓ *ADVISORY ACCEPTED*

OR

✓ *BID REJECTED*

MIS Bid Statuses - Check-out

✓ *ADVISORY ACCEPTED*

- *Transactions must still be confirmed*
 - Verify E-Tag
 - DAM; Confirm Schedules with neighboring CA for this status

✓ *BID ACCEPTED*

- *Transactions have passed Check-out*

This is the approval for a Transaction to flow.

NERC E-Tags

- ✓ Identifies transaction to all appropriate Control Areas
- ✓ Required for External Transactions
 - *Bilateral and LBMP*
- ✓ Tag is submitted through tag authority and used in checkout process
- ✓ Customer's responsibility to enter and update with the following:
 - *NYISO*
 - *Other Control Areas*
 - *OATI (tagging authority)*
- ✓ Profile in tag and in MIS trans must match!!!
See Technical Bulletin #27

A valid E-Tag must be in place at least 85 minutes (S.L.) prior to the dispatch hour or NYISO will not evaluate transaction

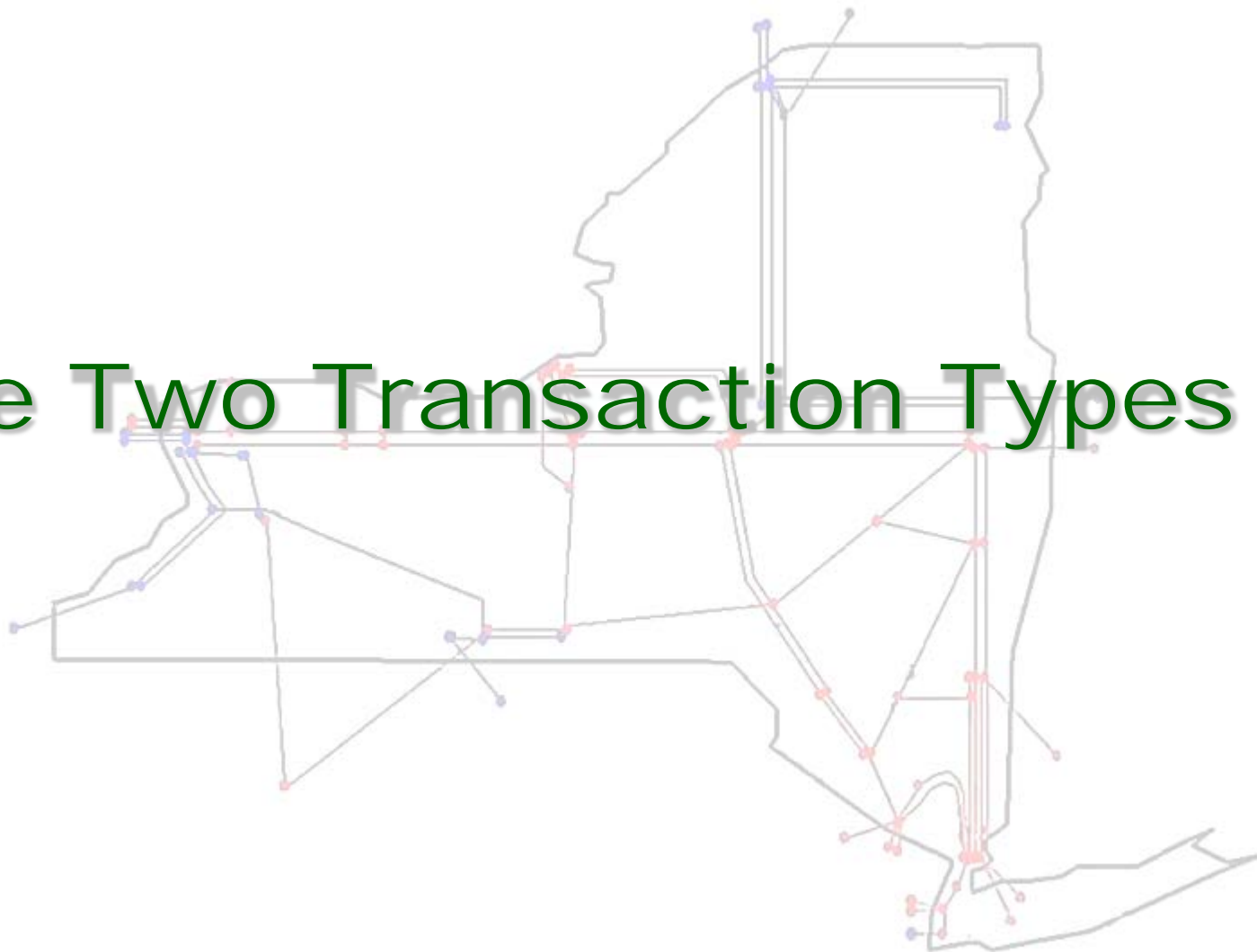
RT Transactions

Pricing Rules

- ✓ See Table in MST Attachment B, Section 17.1.6. for RT Pricing Rules at Proxy Generator Buses, Non-Competitive Proxy Generator Buses, and Proxy Generator Buses Associated with Designated Scheduled Lines
 - *Price set either by RTC_{15} , Rolling RTC, RTD, or SCUC*

- ✓ Binding Proxy Generator Bus Constraints include:
 - *NYCA Ramp Limited*
 - *Interface TTC Constraint*

The Two Transaction Types



Transaction Categories/Types

Neptune and HTP are import only !

1) **LBMP** (External)

- ✓ *Import to Reference Bus*
- ✓ *Export from Reference Bus*

2) **Bilateral** (Internal or External)

- ✓ *Import to Load*
- ✓ *Export from Generator*
- ✓ *Wheel through-proxy to proxy*
- ✓ *Internal Bilateral*

Categorized based on:

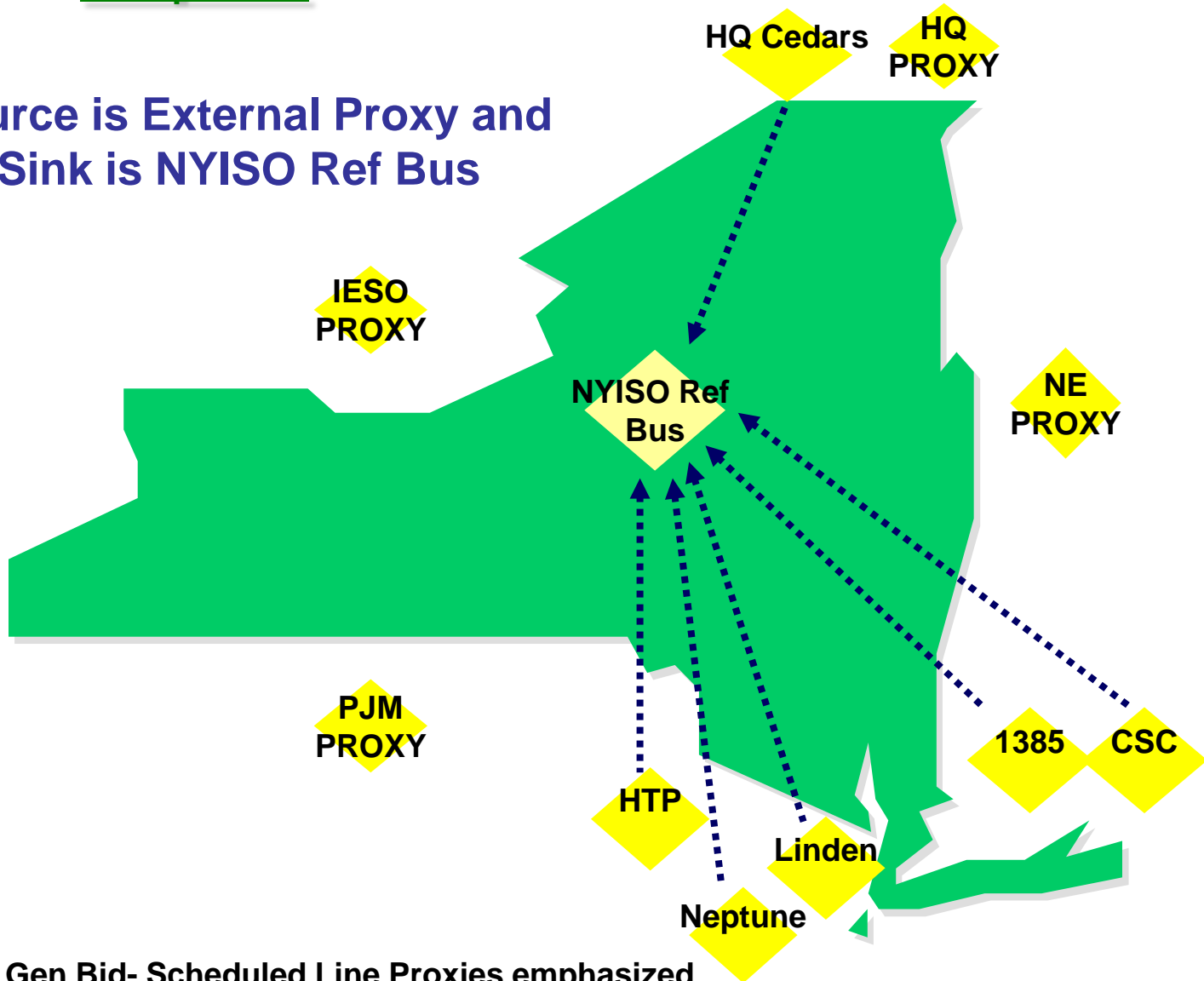
- **Source / Sink points**
- **Settlement**



#1 LBMP TRANSACTIONS: BIDS AND EVALUATION

LBMP Import Transactions from S.L.

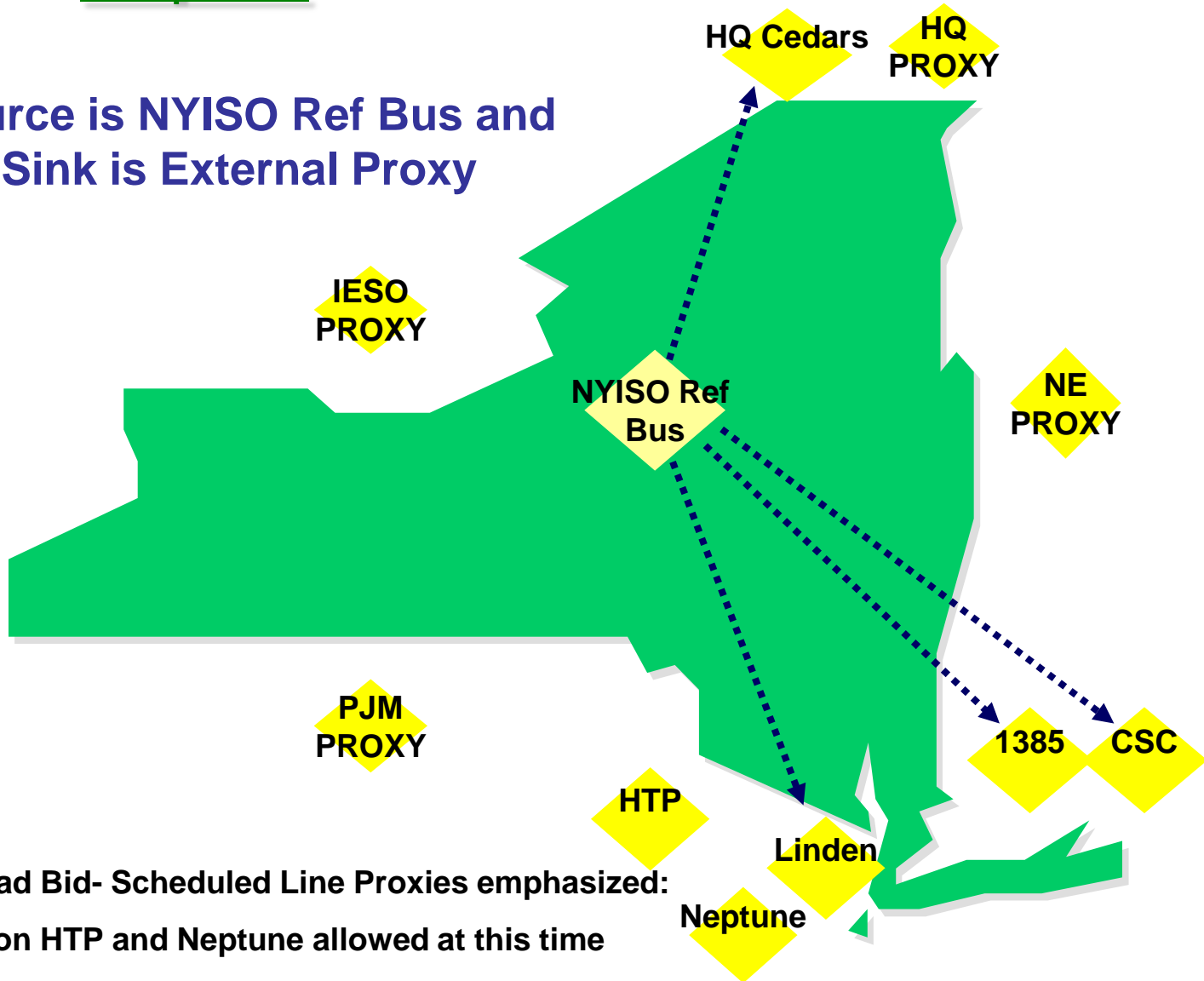
Source is External Proxy and Sink is NYISO Ref Bus



External Gen Bid- Scheduled Line Proxies emphasized

LBMP Export Transactions to S.L.

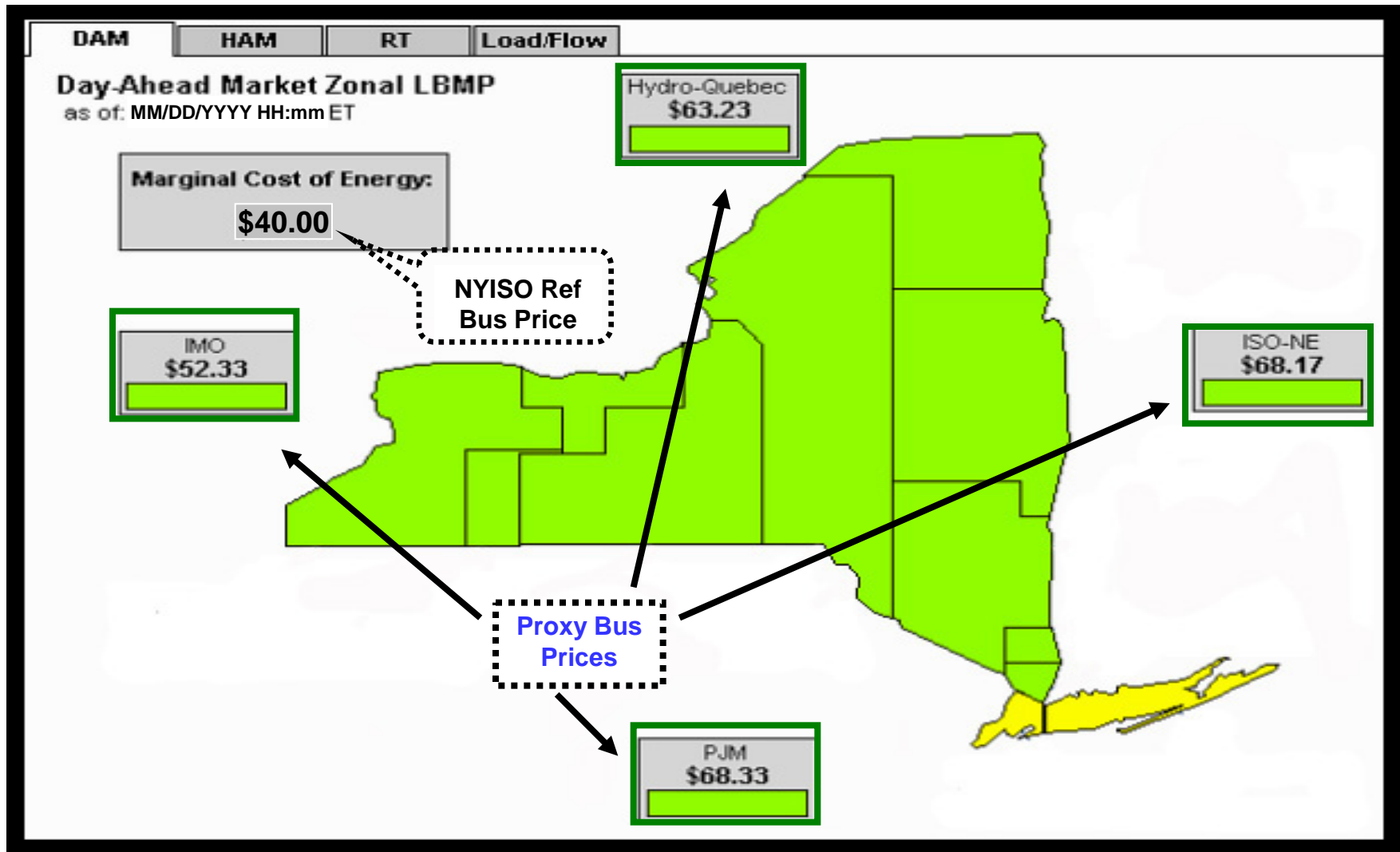
Source is NYISO Ref Bus and Sink is External Proxy



External Load Bid- Scheduled Line Proxies emphasized:
no exports on HTP and Neptune allowed at this time

LBMP Transactions

Bid is evaluated against LBMP at the Proxy bus



Entering transaction bids

LBMP Imports

- Offer a \$/MW “Bid Price” using an 11 pt. Bid Curve
 - Bid evaluated as Supply (Generation) Bid
- The minimum the MP is willing to be paid for the energy
- If proxy [source] LBMP \geq (GREATER THAN or EQUAL TO) the [Dec] Bid, then Bid passes the economic evaluation.

LBMP Import Example



- ✓ MP enters a bid of \$30/MW for a 20 MW transaction from PJM to NY
- ✓ PJM proxy bus price is \$68.33

Will this trans. be scheduled based on economics?

- ✓ *Hint: MP is not willing to take anything less than \$30 for the energy.*
- ✓ *Clearing price is above the bid... $\$68.33 > \30*

Entering transaction bids

✓ **LBMP Exports**

- Offer a \$/MW “Bid Price” using an 11 pt. Bid Curve
 - Bid evaluated as Load Bid
- The maximum the MP is willing to pay for the energy
- If proxy LBMP is \leq the Bid then the Bid passes the economic evaluation.

LBMP Export Example



- ✓ MP enters a bid of \$55/MW for a 20 MW transaction from NY to HQ
- ✓ HQ proxy bus price is \$63.23

Will this trans. be scheduled based on economics?

- ✓ *Hint: MP is not willing to pay more than \$55 for the energy.*
- ✓ *Clearing price is above the bid... $\$63.23 > \55*

MIS Transaction Bid Screen



Transaction Request - External Transactions

Transaction ID XXXXXXX	Source PJM_GEN_VFT_PR OXY	Sink NYISO_LBMP_REFERENCE	NERC Priority FIRM (F-7)	User Ref USERXYZ
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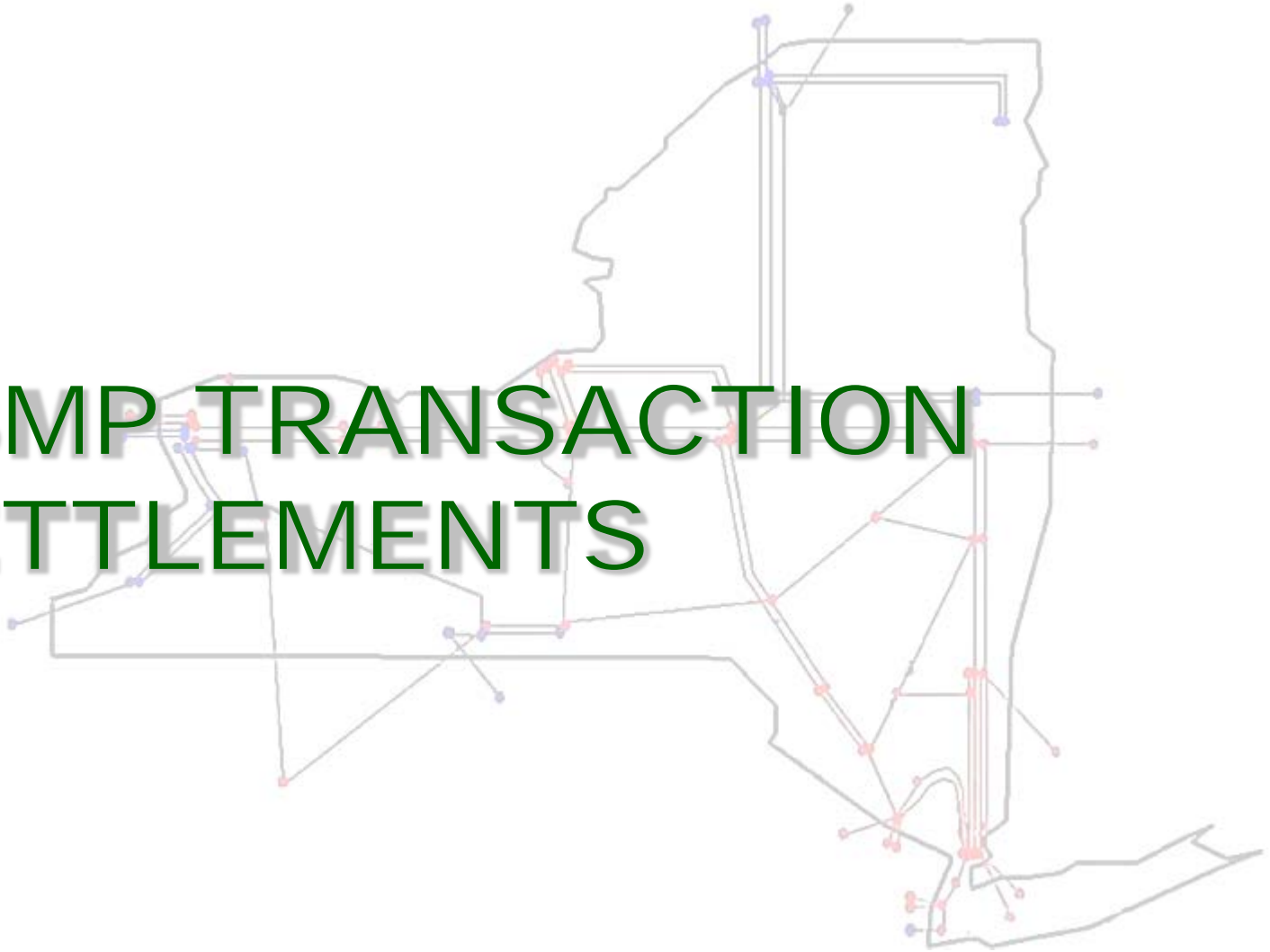
Bid Date 00/00/2011 00:00 <small>(mm/dd/yyyy hh:mi)</small>	Num Hours 1	Market DAM
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Energy Profile MW 125	HAM Bid Schedule Type <input checked="" type="radio"/> Hourly <input type="radio"/> Intra-Hour	NERC Tag SCA PSE Unique Num RCA PJM xxx xxxxxx NYIS	HAM Bid Price
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Bid Curve

MW	125													
\$/MW	29.00													

LBMP TRANSACTION SETTLEMENTS



DAM Settlement – LBMP Transactions

- ✓ Accepted DAM LBMP Transactions
 - *Settle using DAM LBMP at proxy bus*
 - *Hourly basis*

RT Settlement – LBMP Transactions

- ✓ Accepted HAM (RTC) LBMP Transactions
 - **Settle at RTD LBMP** based on scheduled flows, unless there are binding interface or ramp constraints... (see slide above)
 - DAM Bids passed through to HAM for re-evaluation
 - If Bid Rejected in HAM – **Balance at RTD LBMP**

Note: Scheduled flows may be reduced in-hour for reliability reasons.

Other Charges for LBMP Transactions

Charges by Transmission Owner

- TSCs - Transmission Service Charge
- NTAC - NYPA Transmission Access Charge

Charges by NYISO

- Ancillary Services
 - See OATT Section 6 Schedule 1
- Different for imports vs. exports (next slide)

➤ *Based on RT actual flows*

**See TB#39 for estimating TSCs*

Settlement Summary – LBMP Transactions

LBMP Import (external gen bid)

- ✓ Receive Proxy LBMP
- ✓ Import transactions **do not** pay TSCs or NTAC
- ✓ Pay Ancillary Services
 - *Scheduling System Control & Dispatch*

LBMP Export (external load bid)

- ✓ Pay Proxy LBMP
- ✓ Pay TSC & NTAC
 - *TSC does NOT apply to Scheduled Lines that are not owned by the subject Transmission Owner*
- ✓ Pay Ancillary Services
 - *Operating Reserve*
 - *Voltage Support*
 - *Scheduling System Control & Dispatch*

Transaction Categories/Types

Neptune and HTP are import only !

1) **LBMP** (External)

✓ *Import*

✓ *Export*

2) **Bilateral** (Internal or External)

✓ *Import*

✓ *Export*

✓ *Wheel through*

✓ *Internal Bilateral*

Categorized based on:

• **Source / Sink points**

• **Settlement**

#2-Bilateral Transactions



- ✓ A Transaction between two or more parties for the purchase and/or sale of Capacity or Energy other than those in the ISO LBMP Administered Markets.
 - Example: Load Serving Entity (LSE) purchases energy directly from a generator or marketer

- ✓ Parties agree on terms
 - Energy cost component is separate and not part of NYISO settlement
 - Price of energy negotiated between buyer and seller

Bilateral Transactions

- ✓ Pay for transmission service between two points
 - *Charged Transmission Usage Charge (TUC)*

- ✓ Ensures Transmission service is available

- ✓ For Export Bilaterals energy must be bid separately by generator (fyi, also internal bilaterals)

Types of External Bilaterals

- A. *Import Bilateral - external proxy bus to internal NYISO load bus*

- B. *Export Bilateral - internal gen bus to external proxy bus*

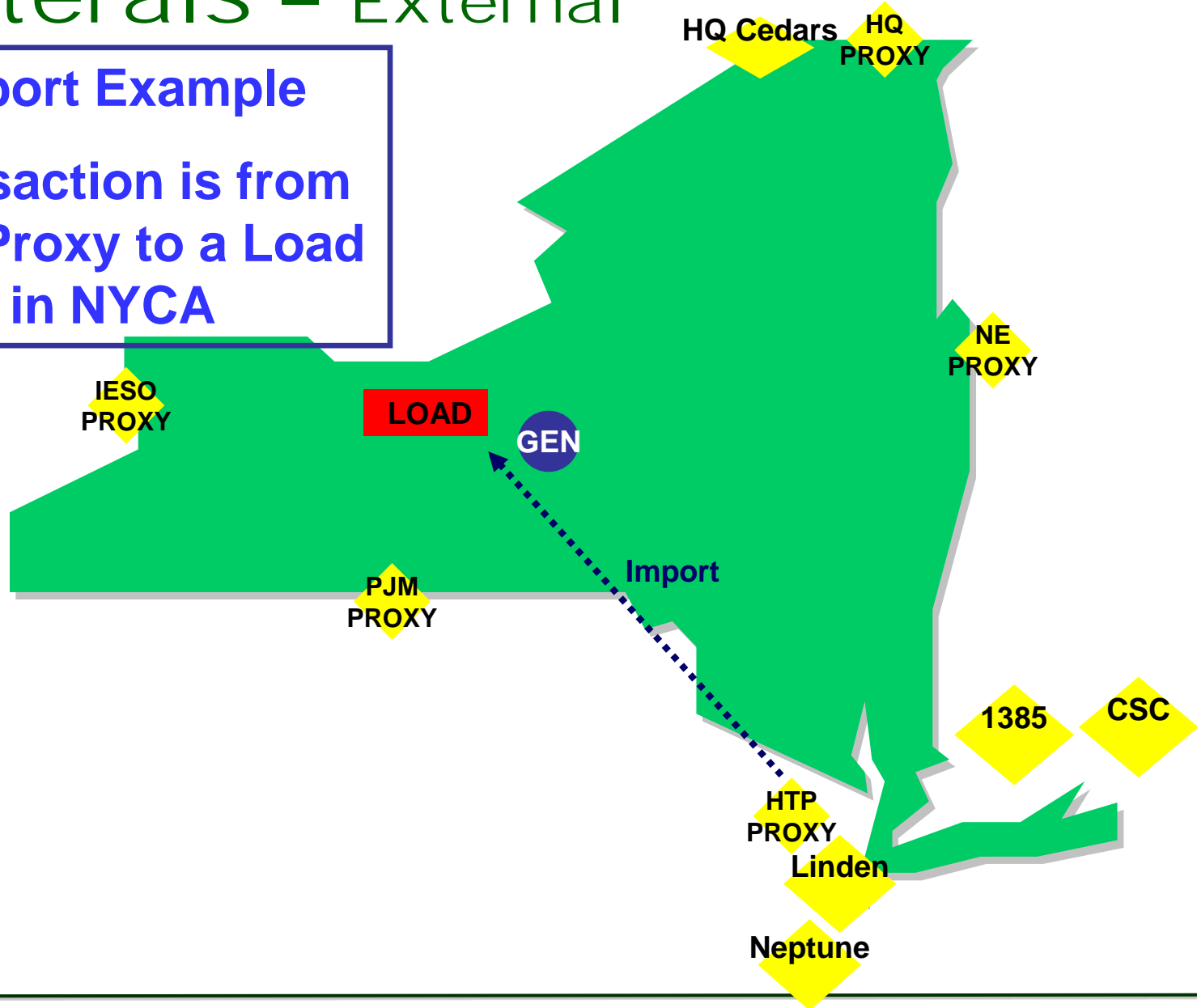
- C. *Wheel through - external proxy to external proxy (flowing through NY)*



**BILATERAL TRANSACTIONS:
BIDS AND EVALUATION**

Bilaterals - External

Import Example
Transaction is from HTP Proxy to a Load in NYCA

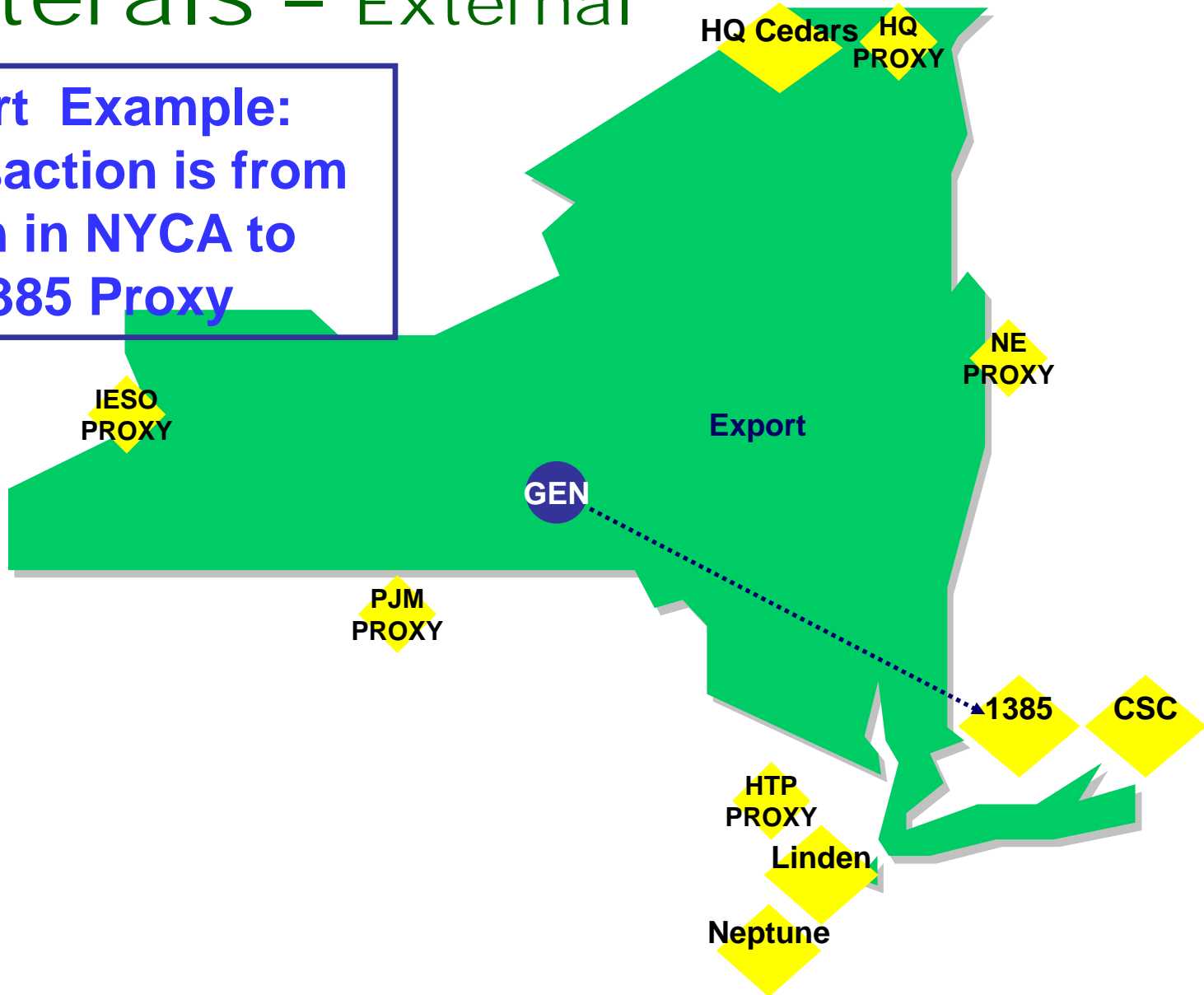


Import Bilaterals

- ✓ *The transmission service component of an Import Bilateral (from the external Proxy Generator Bus to the NYCA Load Bus) is always scheduled.*
- ✓ *The energy import offer component of an Import Bilateral is subject to an economic evaluation, and may not be scheduled, or may only be partially scheduled.*
- ✓ *The Market Participant that scheduled the Import Bilateral is required to pay the TUC between the Proxy Generator Bus and the Load Bus for the full amount of the transmission service scheduled (which may be greater than the MW amount of the scheduled import), and must import or purchase the energy necessary to serve its full transmission service schedule*
- ✓ *MP enters a Bid Price(s) and Bid MWs; evaluation similar to a LBMP Import*

Bilaterals – External

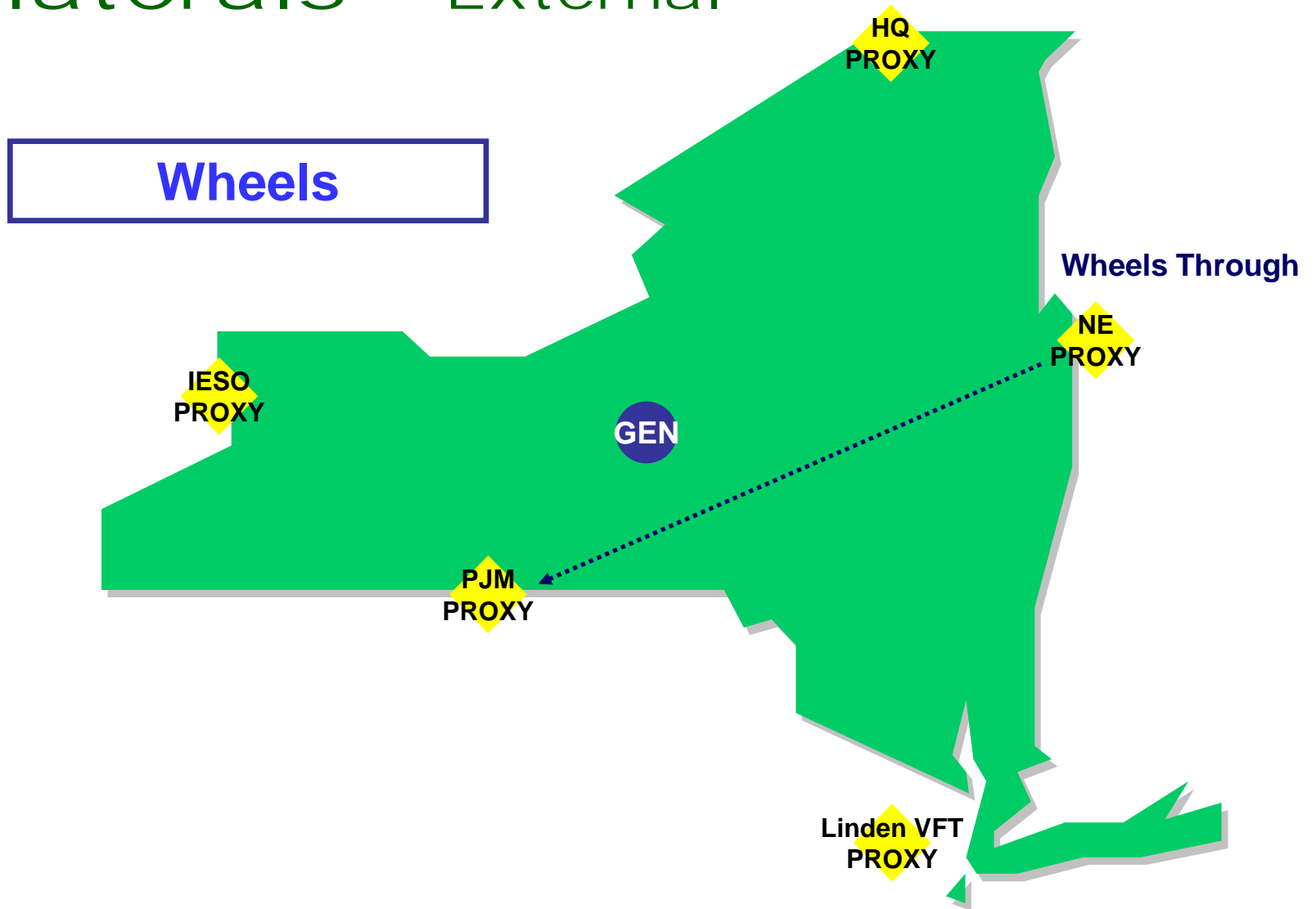
**Export Example:
Transaction is from
a Gen in NYCA to
the 1385 Proxy**



Export Bilaterals

- ✓ MP enters a Bid Price (\$/MW) using an 11 pt. Bid Curve
 - Evaluation is similar to an LBMP Export
 - Bid represents the maximum the MP is willing to pay
 - If proxy LBMP is \leq the Bid, then Bid passes the economic evaluation.

Bilaterals - External

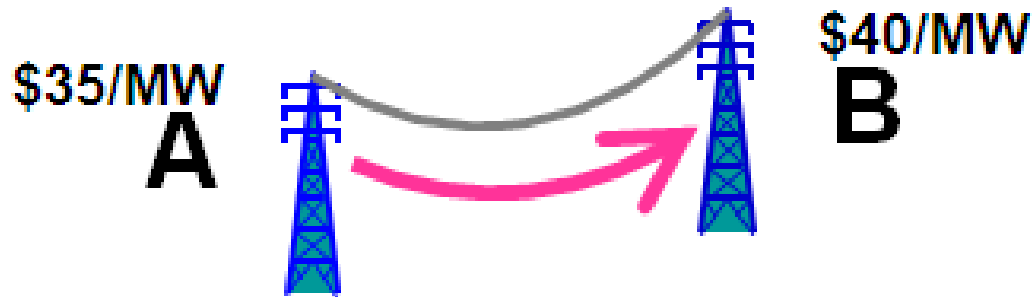


Wheels Through Bilateral Transactions:

- ✓ Wheels do not have the option of Intra-hour scheduling
- ✓ Bid Price is evaluated against the congestion cost of the transaction
- ✓ Congestion cost is difference between congestion at the sink and the congestion at the source
 - *(Sink cong. - Source cong.)*
- ✓ If Cong Cost is lower than the Dec Bid (floor price), then Trans is not economic and therefore bid is rejected
 - *Congestion cost \geq Dec Bid : Economically scheduled*
 - *Congestion cost $<$ Dec Bid: **Not** economically scheduled*

Scheduling Wheels

- ✓ Congestion Cost Example (hourly)--sink minus source



LBMP = Energy + Losses – Congestion
 Sign convention for Congestion is that it is reversed

Dec bid < Cong Cost: Economically scheduled

- ✓ $(-10) - (-5) = -\$5$ Congestion Cost
- ✓ If Bid $-\$8$, is scheduled
- ✓ If Bid $-\$3$, is not scheduled

\$35 LBMP Components @ A = Energy \$30
 Losses \$0
 Congestion $-\$5$

\$40 LBMP Components @ B = Energy \$30
 Losses \$0
 Congestion $-\$10$

Wheels Exercise:

Transaction from ISONE to PJM --- Bid = \$-24

Sink LBMP = \$104
Energy \$82
Loss \$ 5
Congestion \$-17

Source LBMP = \$91
Energy \$82
Loss \$ 5
Congestion \$-4

What is the Congestion Cost?

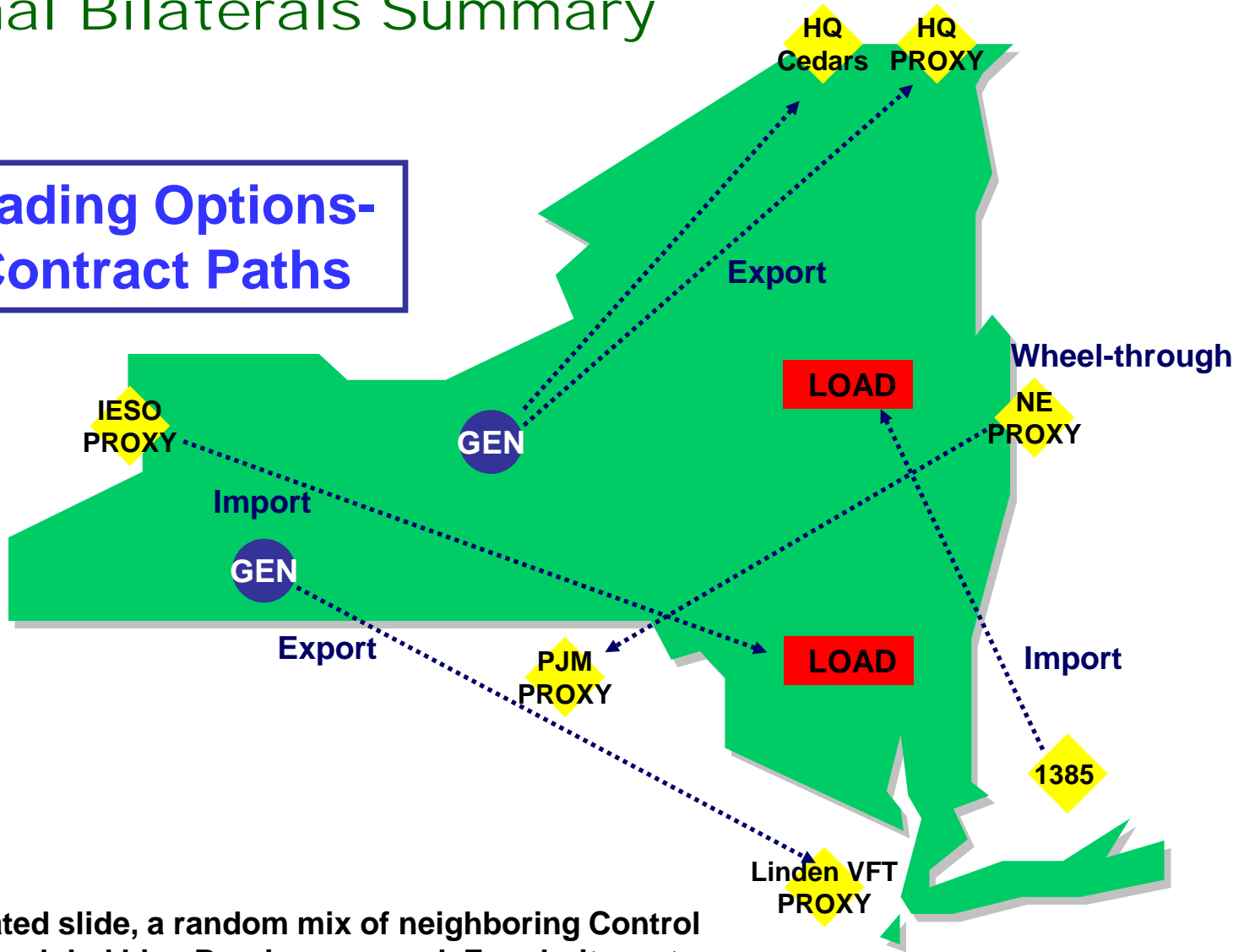
-17- (-4) = -13

Will this transaction be accepted?

Yes, -24 < -13

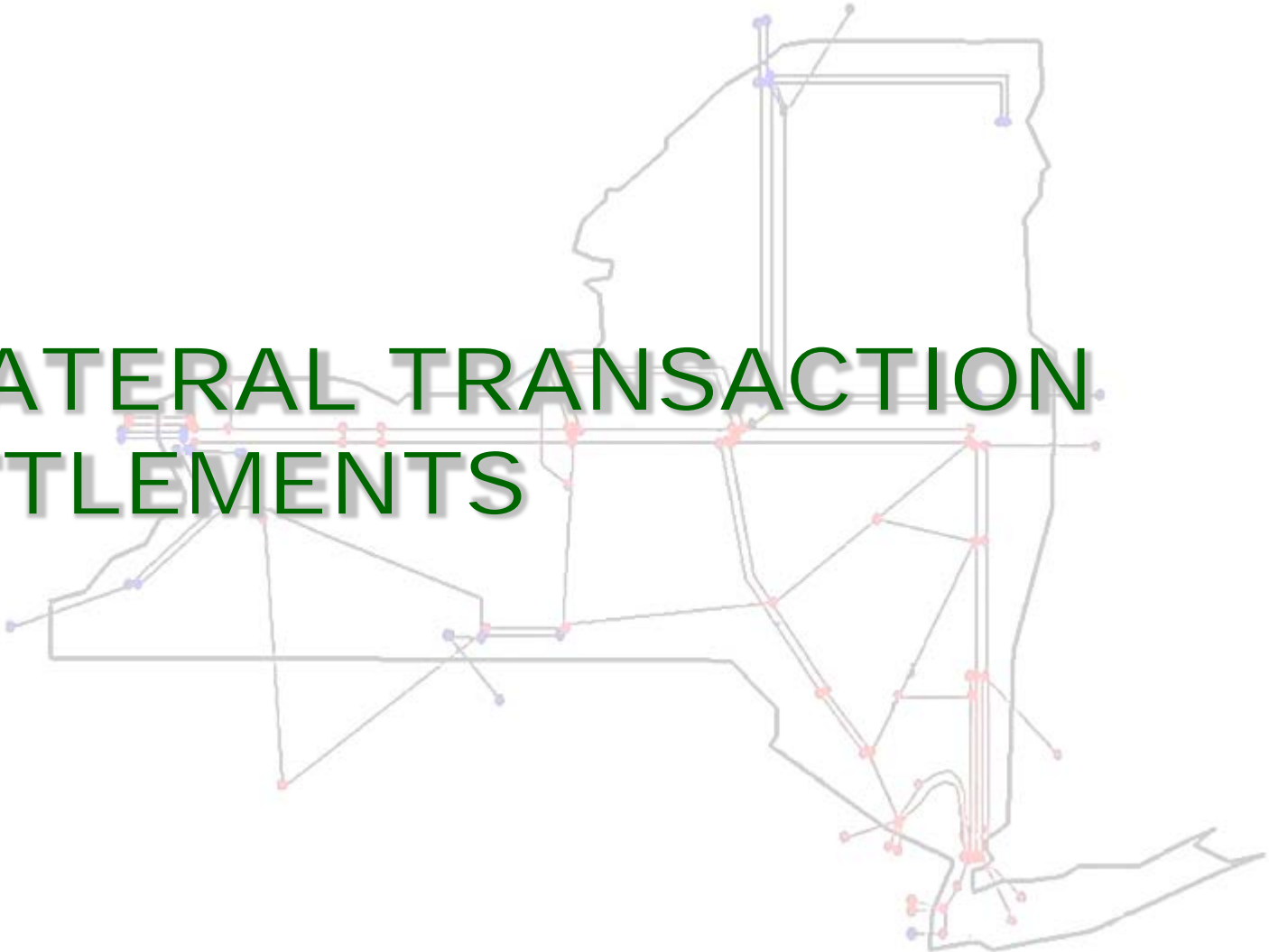
External Bilaterals Summary

**Trading Options-
Contract Paths**



In this animated slide, a random mix of neighboring Control Area and Scheduled Line Proxies are used. For clarity, not all S.L. Proxies are shown.

BILATERAL TRANSACTION SETTLEMENTS



Bilateral Transactions

- ✓ **Import Bilaterals may be charged the LBMP at the proxy for any Replacement Energy (See Slide 41)- the load is served!**
- ✓ **All Bilaterals are assessed a Transmission Usage Charge (TUC).....**

Transmission Usage Charge

- ✓ *Represents the cost of moving power*
- ✓ *Includes the loss and congestion cost components of the LBMP*
- ✓ *Difference in these components at the source and sink*
 - **Sink \$ - Source \$**
- ✓ *Can be positive or negative*
- ✓ *Paid by the FRP (Transaction Owner)*

DAM Settlement – Bilateral TUCs

✓ *Accepted DAM Bilateral bids*

- Settlement at DAM loss & congestion cost components at both source and sink
 - Sink \$ - Source \$

RT Settlement – Bilateral-TUCs

✓ *Accepted HAM Bilateral bids*

- Settlement at **RTD** loss & congestion cost components at both source and sink (**TUC**)

UNLESS

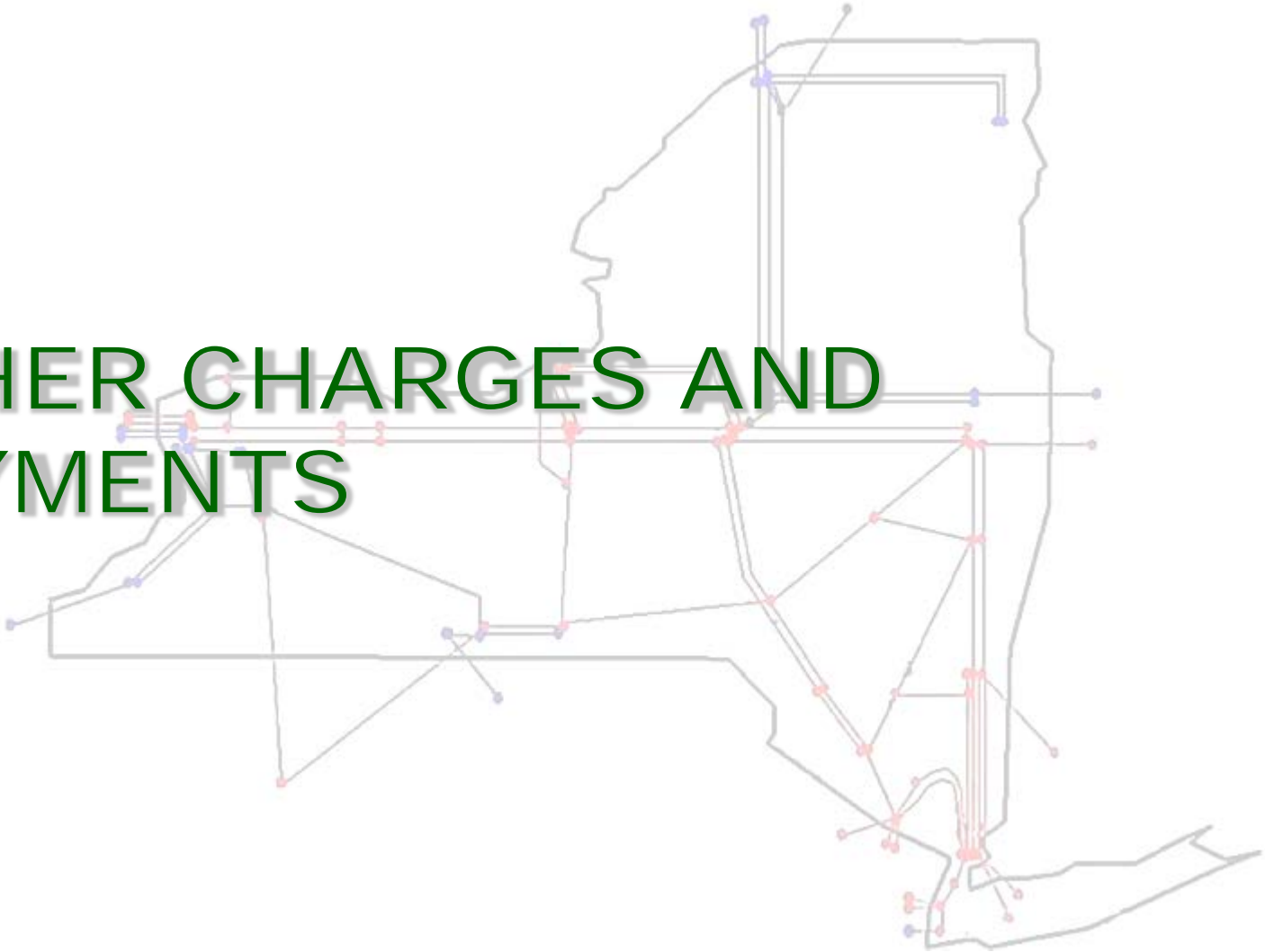
- Binding interface or ramp constraints exists then, HAM (RTC) cost components replace the RTD components for settlement
 - For precise rules, see Market Services Tariff, Attachment B, Sec. 17.1.6.4 (Variably Scheduled Proxy)

Settlement Summary – Bilaterals

- ✓ **NTAC charged to Transaction Owner on Bilateral Exports and Wheels to Scheduled Lines, but not TSC**
 - *Refer to Quick Reference Sheet near end of presentation*

- ✓ **Ancillary Service Charges -Transaction Owner pays**
 - *Applicable charges vary based on transaction type*

OTHER CHARGES AND PAYMENTS



Financial Impact Charge

- ✓ Applicable when a transaction fails checkout due to MP action (hourly or intra-hourly)
 - fails to get ramp
 - fails to get E-tag implemented

- ✓ Applies to HAM bids

- ✓ When RTD sched. MWs < RTC sched. MWs

- ✓ FIC automatically assessed - Absolute difference in RTC and RTD LBMP

Curtailed Transactions

- ✓ External Transactions (LBMP & Bilateral) can be cut for System Security (NYISO)
 - *Cut order based on economic priority*

- ✓ NYISO honors TLRs (transmission load relief) called by neighboring CA
 - *Cut order NOT based on economic priority*

- ✓ Cut Transactions will balance at RT

**See Technical Bulletins 58, 61, 183*

Other Charges/Payments

- ✓ Transactions Supplemental Payments
 - *Bid Production Cost Guarantee for DA/RT Imports*
 - *BPCG not available for hourly transactions on a proxy that allows intra-hourly scheduling.*
 - *RT BPCG not available to imports at Designated Scheduled Lines and Non-Competitive Proxy Buses under certain export constrained conditions such as Interface Capacity or Ramp Capacity limits; see A&B Manual, Section 4.3.4.*
 - *Transaction Import Curtailment Supplier Guarantee*
- ✓ External Transactions are allocated a portion of Rate Schedule 1 charges (which include NYISO Cost of Operations, Residuals and Other Uplift) and exports and wheels are charged a portion of operating reserves and voltage

See Accounting & Billing Manual, also Accounting and Billing Workshop for more detail !

QUICK REFERENCE SHEET



Who Pays for External Transactions and Bilaterals?

Transaction Type	LBMPs	TUCs	TSCs	NTAC
Import LBMP Transaction	Transaction Owner/FRP -Receives proxy LBMP	N/A Built into the LBMP	N/A	N/A
Export LBMP Transaction	Transaction Owner/FRP - Pays Proxy LBMP	N/A Built into the LBMP	Transaction Owner/FRP – Pays* **Sched. Lines	Transaction Owner/FRP – Pays*
Import Bilateral	For Replacement Energy only – Transaction Owner/FRP - pays proxy LBMP	Transaction Owner/FRP - Pays	Load – Pays	Load – Pays
Export Bilateral & Wheels	N/A	Transaction Owner/FRP - Pays	Transaction Owner/FRP - Pays* **Sched. Lines	Transaction Owner/FRP - Pays

*Excludes ISONE **See Slide 34 for TSC rule at a Scheduled Line-currently applicable to Exports on all Scheduled Lines allowing Exports

TUCs: Transmission Usage Charges (Congestion & Losses)

TSCs :Transmission Service Charge

NTAC: NYPA Transmission Access Charge

Training Objectives

1. Define terms relevant to transactions over (Designated) Scheduled Lines.
2. Know neighboring CA Market requirements that the NYISO Market Information System (MIS) must see (if applicable). Review the NYISO DA and RT timelines.
3. Understand basic NYISO Market Mechanics and how transactions are evaluated and settled.

Informational Resources:

- ✓ Market Participants User's Guide (MPUG) Section 7.6, Section 3
- ✓ Accounting and Billing Manual
- ✓ Technical Bulletins
 - ✓ #27 – NERC E-tag
 - ✓ #58 – External Transaction Scheduling messages
 - ✓ #61 – IS+ and RT curtailments
 - ✓ #83 – Bidding/scheduling of Multi-Hour Block Transactions
 - ✓ #92 – IMO (IESO)-NY Transaction scheduling guidelines
 - ✓ #123 - RT Settlement Rules at Competitive External Proxy Buses during RTC Constrained Hours
 - ✓ #150 - HQTE-NYISO Chateaugay-Massena Interconnection Operation above 1500MW in the RT Market
 - ✓ #151 – Import Transactions
 - ✓ #152 – PJM Proxy Bus Pricing and Scheduling
 - ✓ #158 - Transactions at NY-HQ Interface at Chateaugay
 - ✓ #161 – Transactions via the Northport-Norwalk (1385) Scheduled Line
 - ✓ #176 – Scheduling Transactions via the Dennison Scheduled Line
 - ✓ #178 – Bidding & Scheduling Error Messages
 - ✓ #183 – NYISO Actions During Neighboring Control Area TLR Events
 - ✓ #223 – Scheduling Transactions at Proxy Generator Buses Associated with Designated Scheduled Lines

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