

Linked Virtual Transactions

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NEW YORK INDEPENDENT SYSTEM OPERATOR[®]

Pradip Ganesan Market Design Specialist

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Agenda

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Background

- Stakeholders have requested NYISO to introduce Linked Virtual Transactions (LVTs) in the Energy Market portfolio
- LVTs will be offered in addition to Virtual Supply (VS) and Virtual Load (VL) transactions
- This initiative has been identified in the BPWG process as a FRS complete project in 2016
 - This presentation is focused on developing a workable design



Benefits of Linked Virtual Transactions

- RTM
 - separation between two zones
 - Improves liquidity in the market place

 LVTs clear the same quantity of MWs at the source and sink MPs have to bid separate Virtual Supply and Virtual Load transactions in DAM as price takers to achieve a similar outcome

 LVTs allow MPs to arbitrage the price separation between source and sink zones due to congestion and losses between DAM and

Reduces risk for MPs who are trying to hedge the real-time LBMP price



Linked Virtual Transaction Characteristics

- as a Point of Withdrawal (POW) at the sink
 - The source and sink locations are zones within the NYCA
 - An LVT cannot source and sink in the same NYCA zone
- LVTs do not affect market outcomes in Real-Time
- LVTs are directional in nature
 - An LVT is modeled as a flow from the source to the sink location
 - locations

An LVT is a zonal product that is represented as a source-sink pair. It is modeled as a Point of Injection (POI) at the source and

A counter flow LVT can be modeled by switching the source and sink



- (MW) and bid price (\$/MWh)
- to VS and VL transactions
- that can be submitted in a certain zone by an MP
 - the time it takes for DAM to solve

Linked Virtual Transaction Bidding An LVT bid shall include the POI zone, POW zone, quantity

LVT bids can be submitted for each hour in the DAM similar

There will be a cap on the maximum number of bids per hour

Increasing the number of bids per zone per hour for each MP increases



Linked Virtual Transaction Scheduling

- be served in the sink zone
 - the source and sink zones in the DAM
 - zone and the LBMP at the POI zone
 - price, the LVT can fully or marginally clear in the DAM

 Similar to VS and VL transactions, the LVT will decrease the load to be served in the source zone and increase the load to

LVT bid is evaluated against the LBMP price spread between

LBMP price spread is the difference between the LBMP at the POW

If the LBMP price spread is greater than or equal to the bid



Linked Virtual Transaction Settlements

 Each LVT that clears in the DAM will automatically have a balancing market settlement using the Real-Time prices at the source and sink

The balancing market settlement shall be performed in each RTD interval in an hour and then aggregated for that hour

resources

2016 Rate Schedule 1 for Virtual Resources is \$0.0850/MWh

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LVTs shall be subject to Rate Schedule 1 charges for virtual



Linked Virtual Transaction Mitigation

- Current mitigation rules in the virtual markets check for and mitigate the following types of activity in the virtual markets
 - **Unwarranted divergence between DAM and RTM zonal prices**
 - Increased bids in real time is tracked when the MP has a scheduled VL bid for the same hour of the dispatch day
- New mitigation rules are required to monitor LVT trading activity
 - The divergence in the price difference between two zones between DAM and RTM zonal prices shall be monitored
 - NYISO is considering provisions for monitoring the virtual trading activity with respect to TCC positions in the MP's portfolio
 - Any new mitigation rules shall be reviewed with stakeholders as part of this initiative in future MIWG presentations



Linked Virtual Transaction Credit Impacts

- credit requirements after LVTs are introduced

 - future CPWG meetings

An MP trading in the virtual markets will be subject to new

An MP's bid portfolio that includes VS, VL and LVTs shall be evaluated for each type of virtual product when determining credit requirements

Credit requirements for LVTs and any impacts on existing VS/VL type transactions will be analyzed and then reviewed with stakeholders at



Uplift Cost Allocation in Virtual Markets

• transactions to the extent that DAM Energy purchases and **Bilaterals are below the NYISO load forecast**

- The rule is applied to the extent that the NYISO load forecast does not exceed the actual load
- The DAM BPCG applies to only the units that were committed additionally in the forecast pass in DAM
- NYISO's proposal is to remove the uplift cost allocation for all virtual transactions
 - The uplift cost allocation in the virtual markets has been small over the last few years

Existing market rules allocate a portion of the DAM BPCG to net VS

The costs associated with tracking uplift cost allocation in the virtual markets outweigh any savings from keeping the rule and extending it to LVTs

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LVT Bidding Example

Zone F

Bid Type	Hour	Source Zone	Sink Zone	Quantity	Price
LVT Bid	HB16	Zone F	Zone J	10 MW	\$5/MW

In this example, LVT Bid will clear in HB16 in the Day-Ahead Market, if the price difference between Zone J (sink) and Zone F (source) is greater than or equal to \$5/MW

Zone J



LVT Scheduling Example Zone J

Zone F

Market Type	Zone F	Zone J
DAMCP	\$21/MW	\$27/MW
RTMCP	\$22/MW	\$30/MW

LVT Bid clears 10 MW in HB16 since the price difference between Zone J and Zone F in the DAM is \$6/MW, which is greater than the bid price of \$5/MW



LVT Settlements Example						
	Zone F		Zone J			
Market	Zone F	Zone J	Net Settlement			
Day-Ahead Market Settlement	\$21/MW * 10 MW = \$210	\$27/MW * 10 MW * (-1) = \$-270	\$210 + \$-270 = \$-60			
Balancing Market Settlement	\$22/MW * 10 MW * (-1) = \$-220	\$30/MW * 10 MW = \$300	\$-220 + \$300 = \$80			
	LVT Settlement	\$-60 + \$80 = \$20 *				

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Credit to MP Charge to MP

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*MP gets paid \$20 in HB16 in this example



LVT Transaction Fees Example Cleared MW in HB16 is 10 MW

- 2016 Rate Schedule 1 for Virtual Resources is \$0.0850/MWh
- LVT Transaction Fees is determined as follows:
 10 MW * \$0.0850/MW = \$0.85 (for HB16)
 - Net MP Settlement for HB16 = \$20 \$0.85 = \$19.15

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Next Steps

- Review feedback received from stakeholders
 - Written comments are due by April 29, 2016 and can be sent to pganesan@nyiso.com
- and September of 2016 to propose market rules
- Credit requirements for LVTs shall be developed in

 Come back to future MIWG presentations between May parallel and presented at upcoming CPWG meetings



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