

# Virtual Trading

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**New York Market Orientation Course (NYMOC)**

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Remote Learning

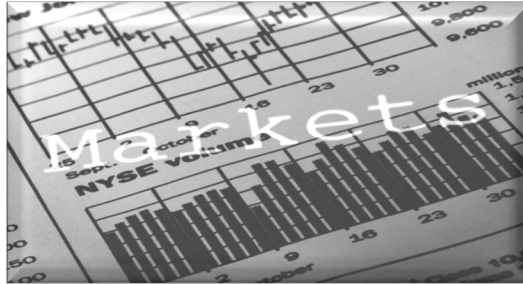
# Session Objectives

**At the conclusion of this session, attendees will be able to:**

- Define what is meant by virtual trading.
- Describe the benefits of the virtual market.
- Distinguish between virtual supply and virtual load bids.
- Calculate the settlement for a virtual supply and a virtual load bid.

# What is Virtual Trading?

Hedging  
Mechanism



The submission of bids for the financial purchase or sale of energy.....rather than or in addition to the physical delivery or purchase of energy in the NYISO administered energy markets.

Financial  
Transactions



# What is Virtual Trading?

Financial  
Transactions

- A Virtual Supplier bids and sells in the Day-Ahead Market and buys back automatically in the Real-Time Market



- Virtual Load bids and buys in the Day-Ahead Market, and sells back automatically in the Real-Time Market



INTEND TO BUY LOW AND SELL HIGH

# Day Ahead and Real Time Price Comparison

Table A	Zone Name	DAM LBMP (\$/MWhr)	RT Int LBMP (\$/MWhr)
12/6/20XX 17:00	CENTRL	38.54	33.11
12/6/20XX 17:00	DUNWOD	42.41	36.06
12/6/20XX 17:00	HUD VL	42.14	36.07
12/6/20XX 17:00	LONGIL	51.75	45.55

Table B	Zone Name	DAM LBMP (\$/MWhr)	RT Int LBMP (\$/MWhr)
7/31/20XX 17:00	CENTRL	41.08	67.26
7/31/20XX 17:00	DUNWOD	43.42	70.45
7/31/20XX 17:00	HUD VL	43.38	70.55
7/31/20XX 17:00	LONGIL	62.97	169.37

Which table would be the best market outcome for a Virtual Supply?

Which table would be the best market outcome for a Virtual Load?

# Virtual Trading

## ■ Financial Transactions Only

- No actual production or consumption of energy
- No effect on real time physical energy consumption
- Does not compromise physical commitment of energy resources for system reliability

## ■ Role in DAM LBMP Calculation

- Illustration to follow

# Benefits of Virtual Transactions

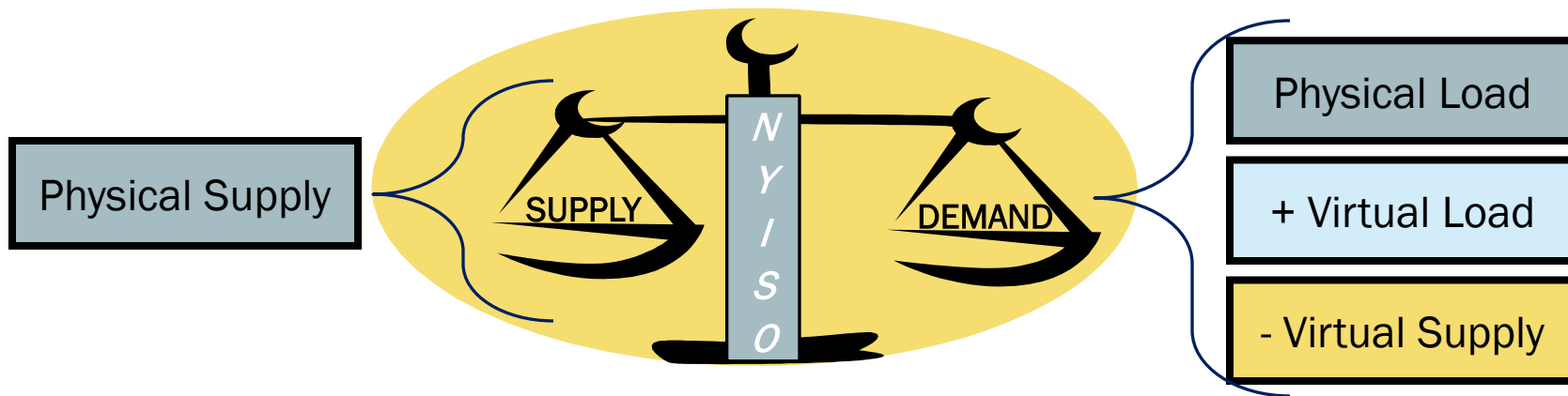
# Benefits of Virtual Trading

- **Allows companies outside the electric industry to participate in the NY Energy Market**
  - Potential opportunity to hedge a financial position
- **Assists in bringing Price Convergence between Day-Ahead and RT Market prices**
  - Illustration to follow



# Role of Virtual Bids in DAM LBMP

- Day Ahead Scheduling Process\*
  - Uses SCUC Software
  - Evaluation and scheduling of Bids and Offers



\* Refer to Day-Ahead Scheduling Manual, Section 4.3.1 for details

# SCUC Passes and Virtual Bids

## Pass 1 of SCUC

Solves for Bid Load, Virtual Load and Virtual Supply



## Pass 2 of SCUC

Commits additional units used to supply Forecast Load; Load bids (physical & virtual) and Virtual Supply bids are NOT considered in this pass



## Pass 3 of SCUC

Reserved for future use



## Pass 4 of SCUC

Forecast Load Re-dispatch; Dispatches units committed in Pass 2



## Pass 5 of SCUC

Final dispatch determined to supply Load Bid, Virtual Load and Virtual Supply; Final Day Ahead LBMPs are established

# Virtual Bids in DAM and Effect on Price with and without Virtual Bids

- Scenario where VL is greater than VS

Day-Ahead Market Load	MWh
Physical Load Bid	200
(+) Virtual Load Bid	0
(-) Virtual Supply Bid	0
Day-Ahead Load is:	200
to be supplied by:	
Gen A 50 MW @ \$20	50
Gen B 50 MW @ \$25	50
Gen C 110 MW @ \$30	100
Gen D 150 MW @ \$40	
	200
Marginal Energy Cost is <b>\$30</b> in the DAM	

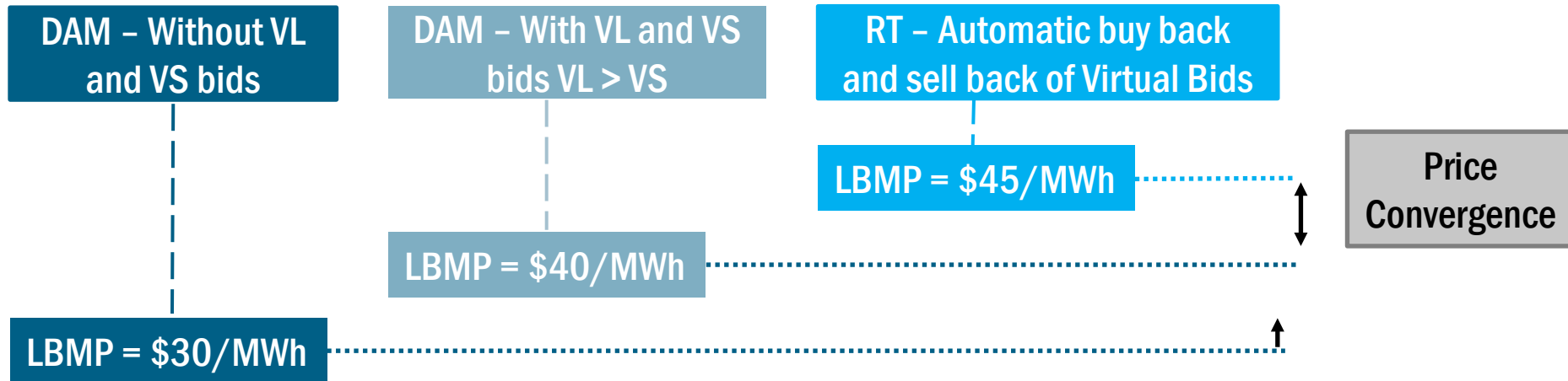
Day-Ahead Market Load	MWh
Physical Load Bid	200
(+) Virtual Load Bid	+150
(-) Virtual Supply Bid	-50
Day-Ahead Load is:	300
to be supplied by:	
Gen A 50 MW @ \$20	50
Gen B 50 MW @ \$25	50
Gen C 110 MW @ \$30	110
Gen D 150 MW @ \$40	90
	300
Marginal Energy Cost is <b>\$40</b> in the DAM	

# Virtual Bids- Effect on Prices

- Facilitates price convergence between Day Ahead and RT Market prices

Scenario: Virtual Load is greater than Virtual Supply ( $VL > VS$ )

VL Bidders speculate that RT LBMP will be higher than DAM LBMP



# Virtual Bids in DAM and Effect on Price with and without Virtual Bids

- Scenario where VS is greater than VL

Day-Ahead Market Load	MWh
Physical Load Bid	200
+ Virtual Load Bid	0
- Virtual Supply Bid	0
Day-Ahead Load is:	200
to be supplied by:	
Gen A 50 MW @ \$20	50
Gen B 50 MW @ \$25	50
Gen C 110 MW @ \$30	100
Gen D 150 MW @ \$40	
	200
Marginal Energy Cost is <b>\$30</b> in the DAM	

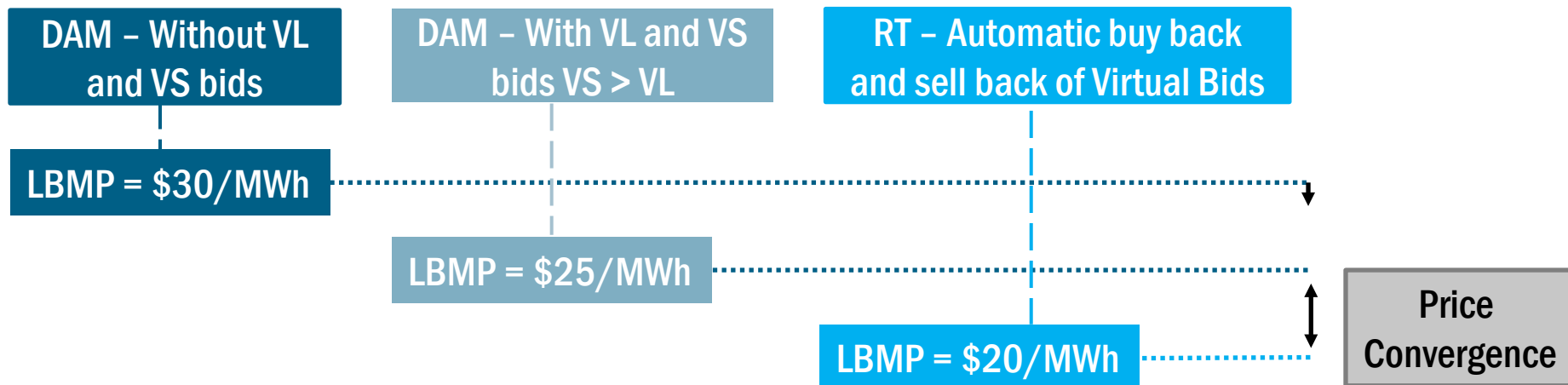
Day-Ahead Market Load	MWh
Physical Load Bid	200
+ Virtual Load Bid	+50
- Virtual Supply Bid	-175
Day-Ahead Load is:	75
to be supplied by:	
Gen A 50 MW @ \$20	50
Gen B 50 MW @ \$25	25
Gen C 110 MW @ \$30	
Gen D 150 MW @ \$40	
	75
Marginal Energy Cost is <b>\$25</b> in the DAM	

# Virtual Bids – Effect on Prices

- Facilitates price convergence between Day Ahead and RT Market prices

Scenario: Virtual Supply is greater than Virtual Load ( $VS > VL$ )

VS Bidders speculate that RT LBMP will be lower than DAM LBMP



# **Virtual Supply and Virtual Load Bidding**

# Bidding Requirements

## ■ Pass Virtual Trading Competency Exam

- Before NYISO activates bidding rights for MP
- Self-learning training module available on-line

## ■ Pass Credit Evaluation

- Bids that receive an initial bid status of Validation Passed will be subject to a Virtual Bid credit evaluation
- Occurs at the zonal level
- Credit requirements are based on the historical price differential between the energy prices in the DAM and RT market
- Insufficient credit to cover exposure of all the submitted bids will fail the credit check



# Virtual Trading Bid Process

- **Bidding is done at the zonal level**
- **Bids submitted at the bus level specific to a zone**
  - Each organization is allowed up to 3 Virtual Load (VL) and 3 Virtual Supply (VS) buses per zone

# Virtual Supply Bid Process

## Market Evaluation

### ■ Sell DAM

- Places up to a 3-point Bid curve per bus x 3 buses max per zone
- Bid represents minimum price VS Bidder is willing to be paid @ DAM Price
- Bids due by 5 AM

### ■ Buy RT

- No Action Required (or possible)
- Automatically buy back @ RT Price



# Virtual Supply Bid Example

Virtual Supply	DAM Bids		DAM LBMP	Accepted or Rejected?
Price Cap Bid #1	50 MW	\$28/MW	\$30/MW	
Price Cap Bid #2	50 MW	\$29/MW		
Price Cap Bid #3	50 MW	\$32/MW		

	Total Accepted DAM MWs
Virtual Supply	

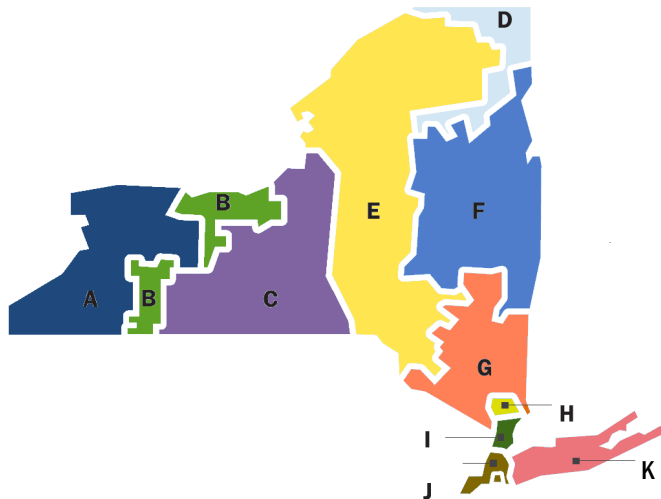


# Virtual Load Bid Example

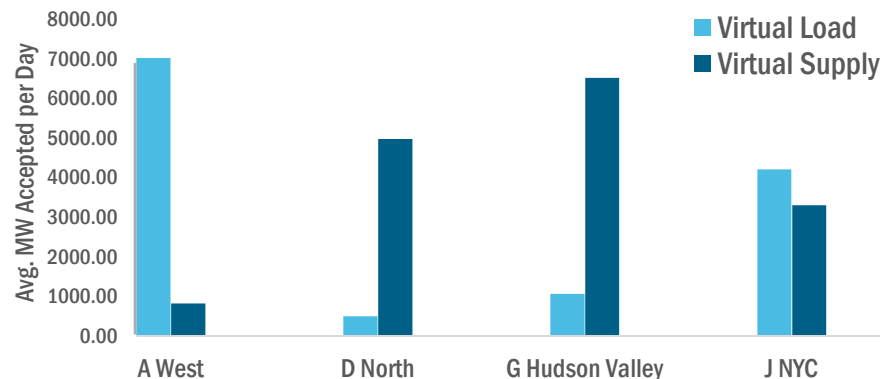
Virtual Load	DAM Bids		DAM LBMP	Accepted or Rejected?
Price Cap Bid #1	50 MW	\$28/MW	\$30/MW	
Price Cap Bid #2	50 MW	\$29/MW		
Price Cap Bid #3	50 MW	\$32/MW		

	Total Accepted DAM MWs
Virtual Load	

# Virtual Supply and Load Bids – Bidding by Internal Zones – Example Month



Representative Month – May 2019



Virtual Supply  
and Load,  
May 2019:  
Average MWs  
Accepted per  
Day

	West A	North D	Hudson Val G	NYC J
Virtual Load	7022	498	1064	4207
Virtual Supply	818	4977	6518	3305

# Virtual Transaction Bid Process

## ■ Post Bid Submittal

- Check the status for each Bid hour
  - ‘Validation Passed’ if all required data has been entered
  - ‘Validation Failed’ need to review, correct, and re-submit

Note: Bids undergo a credit evaluation that occurs upon submission and continues until the DAM closes

- Changing Bid
  - Up to 5 AM
- Check Final Bid Status
  - ‘Evaluating’
  - ‘Bid Accepted’
  - ‘Bid Rejected’

# Virtual Transaction Settlement Process

# Virtual Transaction Settlement Process

## ■ Two Settlement System

- Virtual Suppliers
  - Virtual Supply Sells in DAM @ DAM LBMP if accepted
  - Virtual Supply Buys Back in RT @ RT LBMP
- No Action Required in RT





## ■ Two Settlement System

- Virtual Loads
  - Virtual Load Buys in DAM @ DAM LBMP if accepted
  - Virtual Load Sells Back in RT @ RT LBMP
- No Action Required in RT



# Virtual Transaction Settlement Process

## ■ Two Settlement System\*

- DAM Settlement

- Hourly Price

- RT Settlement

- RTD (~5 min) level interval price
  - Interval settlements summed to the hour

\*Settlements based on Zonal Prices

Day Ahead Market Virtual Supply			
	Total DAM Stlmnt	Total DAM Price	DAM Virtual Supply
09:00 Hour	(\$)	(\$/MW)	(MW)
	489.20	24.46	20


Balancing Market Virtual Supply			
	Total BALMkt Stlmnt (\$)	Total RT Price (\$/MW)	DAM Virtual Supply (MW)
Time			
9:00	-28.53	17.12	-1.67
9:05	-30.23	18.14	-1.67
9:10	-30.30	18.18	-1.67
9:15	-31.15	18.69	-1.67
9:20	-33.95	20.37	-1.67
9:25	-36.10	21.66	-1.67
9:30	-34.42	20.65	-1.67
9:35	-31.42	18.85	-1.67
9:40	-36.10	21.66	-1.67
9:45	-34.32	20.59	-1.67
9:50	-40.87	24.52	-1.67
9:55	-35.62	21.37	-1.67
Hr Total	-403.00		-20.00

# Summary

- **Define what is meant by a virtual bid**
  - Financial Transaction Only
- **Describe the benefits of the Virtual Market.**
  - Allows companies outside the electric industry to participate in the NY Energy Market
  - Assists in bringing Price Convergence between Day-Ahead and RT Market prices
- **Distinguish between virtual supply and virtual load bids.**
  - VS sells in DAM and buys back in RT
  - VL buys in DAM and sells back in RT
- **Calculate the settlement for a virtual supply and a virtual load bid.**
  - Two settlement system using Zonal prices at respective Market (DAM or RT) multiplied by MWs

# Virtual Trading – NYISO Website Information

# Virtual Trading Resources



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Customer Registration

Knowledge Articles

Market Monitoring

## Counterparty & Credit Risk

### NYISO Counterparty & Credit Risk Management Training

[TCC Training Module](#)  
[TCC Competency Exam](#)  
[MT 202: Virtual Trading](#)  
[Virtual Trading Competency Exam](#)

#### Counterparty & Credit Risk Management

Name	Published	Type
NYISO Standard Collateral Format Forms		
Price Differentials		
2025 DSASP Price Differentials	2025/01/02	pdf
Energy Bid Price Differential Matrix	2025/02/03	csv
Energy Bid Price Differential Matrix	2025/02/03	pdf
Virtual Bid Price Differential Matrix	2025/02/03	csv
Virtual Bid Price Differential Matrix	2025/02/03	pdf

# Additional Resources

- **Day-Ahead Scheduling Manual**
- **MST (Market Services Tariff)**
- **Market Participant's User's Guide (MPUG)**