Convergence bidding

Engaging in convergence bidding

Hedging examples – using a virtual demand bid to hedge demand

Module objectives

- By the end of this module, student will be able to discuss how a virtual demand bid can be utilized to hedge against both demand and supply deviations in the real-time vs day-ahead markets.

Why engage in virtual bidding?
Base example - demand

- Lori is a Load Serving Entity with 1,000 MW of load
- She schedules 850 MW of her actual load into the day-ahead market
- The metered value is 950 MW
- She does not submit any virtual bids

Why engage in virtual bidding?
Base example – demand

Day-ahead schedule	
Physical load schedule (850MW*$100)	$ 85,000
Real-time meter = 950MW	
RT UIE = meter – Total expected energy = 950-850 = 100	
UIE charge = 100MW*$120	$ 12,000
Total net settlement (charge)	$ 97,000

* Presented in ISO Settlements format. Positive value = charge; Negative value = payment

Why engage in virtual bidding? Hedging example - demand

- What if Lori had a 100 MW virtual demand bid?
  - buy at the day-ahead price and sell in FMM

Why engage in virtual bidding?
Hedging example - demand

Day-ahead schedule

Physical load schedule 850MW*$100	$ 85,000
Virtual demand award 100MW*$100	10,000
Total day-ahead charge	$ 95,000

Real-time meter = 950MW

RT UIE = Meter – Total expected energy(Physical)
= 950MW – 850MW = 100MW

UIE charge 100MW*$120	$ 12,000
Liquidation of virtual demand award 100MW*$120	(12,000)
Total real-time payment	0

Total settlement (charge) $ 95,000

Why engage in virtual bidding?
Hedging example - demand

	Without Convergence Bidding	After Convergence Bidding
Day-Ahead Settlement	$85,000	$95,000
RT UIE	12,000	12,000
Virtual Award Liquidation	0	(12,000)
Total Settlement (Charge)	$97,000	$95,000

Saved $2,000 by buying at the DA Price

Why engage in virtual bidding?
Hedging example - supply

- Victor is a merchant generator who owns an aging resource with a 400 MW Pmax
- Victor is concerned about a newly found steam tube leak having the potential to force his unit off-line before he can schedule a planned outage
- Victor often self schedules his resource to Pmax

Why engage in virtual bidding?
Base example - supply

Day-ahead schedule	
Physical supply schedule (-400MW*$50)	($ 20,000)
Total day-ahead payment	($ 20,000)
Real-time meter = 250MW	
RT UIE = Meter – Total expected energy (Physical)	
= 250-400 = -150	
UIE charge = -150MW*$65	9,750
Total net settlement (payment)	($ 10,250)

* Presented in ISO Settlements format. Positive value = charge; Negative value = payment

Why engage in virtual bidding?
Hedging example - supply

- Victor uses virtual bids to hedge against the possibility of a forced outage.

- If he buys at the day-ahead price, he can potentially offset some of his exposure to the FMM prices if his resource actually has an outage.

Why engage in virtual bidding?
Hedging example - supply

Day-ahead schedule

Physical supply schedule	-400MW*$50	($ 20,000)
Virtual demand award	200MW*$50	10,000
Total day-ahead payment		($ 10,000)

Real-time meter = 250MW

RT UIE = Meter – Total expected energy (physical)
= 250MW – 400MW = -150MW

UIE Charge	-150MW*$65	9,750
RT liquidation of awarded virtual bid	200 MW*$65	(13,000)
Total real-time payment		($3,250)

Total settlement (payment) ($ 13,250)

Why engage in virtual bidding?
Hedging example - supply

	Without Convergence Bidding	After Convergence Bidding
Day-Ahead Settlement	$20,000	$10,000
RT UIE	9,750	(9,750)
Virtual Award Liquidation	0	13,000
Total Settlement (Payment)	$10,250	$13,250

Made $3,000 with a 200 MW Virtual Demand Bid

Defining convergence bidding
Module summary

- Virtual bids are financial position (not physical delivery) at a location (price node) in the day-ahead market
- Virtual awards are paid or charged in the day-ahead market and are liquidated in the real-time market
- Virtual demand buys in the day-ahead and sells back in the real-time (long position)
- Virtual supply sells in the day-ahead and buys back in the real-time (short position)
- Allows participants to hedge prices between the day-ahead market and the real-time market

Defining convergence bidding
Module summary

- Virtual bids not used in the market power mitigation process or in the residual unit commitment process of the day-ahead market
- Virtual bids are used in the integrated forward market process
- Virtual bids impact how physical supply is committed in both the integrated forward market and in the residual unit commitment process