

## **Using Virtual Bids to Manipulate the Value of Financial Transmission Rights**

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Presented by:  
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# A framework for the analysis of manipulation

- ◆ One way to explain the cause and effect of manipulation is to separate the analysis into a framework of three pieces:
  - A Trigger - Actions intended to directionally move a price
  - A Target - The position(s) that benefit from that price movement
  - A Nexus - A provable linkage between the Trigger and Target
- ◆ Three things that can trigger a market manipulation are:
  - Use of market power to alter a price
  - Statements or actions that misrepresent value to alter a price
  - Transactions that intentionally lose money to alter a price
- ◆ This framework works to analyze market manipulations for all three situations
- ◆ This presentation discusses the uneconomic use of virtual bids to manipulate the value of financial transmission rights, such as was allegedly used in the recent Constellation case

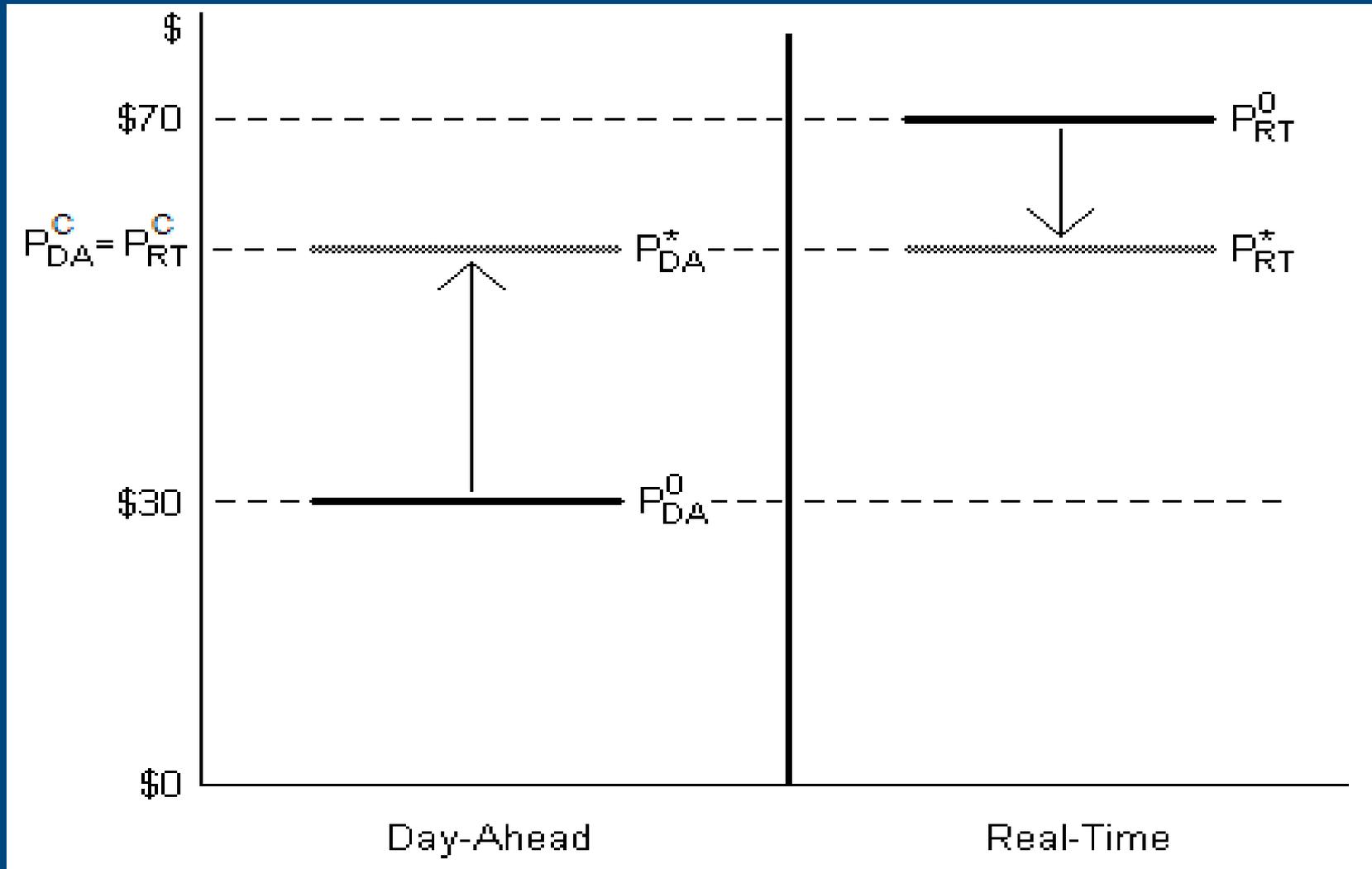
# A model: Using virtual bids to benefit the value of FTRs

- ◆ The following economic model assumes a Trader places virtual load (a.k.a., “DECs”) at the sink of their FTR position
  - We begin by describing the Trader’s decision to place virtual bids on a stand-alone basis
    - Initial simplifying assumption of only one virtual trader
    - Reality check afterwards to discuss multiple traders
    - Virtual bids used as the manipulation’s *trigger*
  - Next, we see how the addition of a FTR affects the trader’s behavior
    - The FTR is the manipulation’s *target*
    - The profitability of the manipulation is shown to depend on the size of the FTR position
- ◆ The model identifies a “bright line” test to find the level of virtual bidding that suggests manipulation of the Trader’s FTR
- ◆ The test should be corroborated with additional evidence of intent before the Trader can be reasonably accused of manipulation

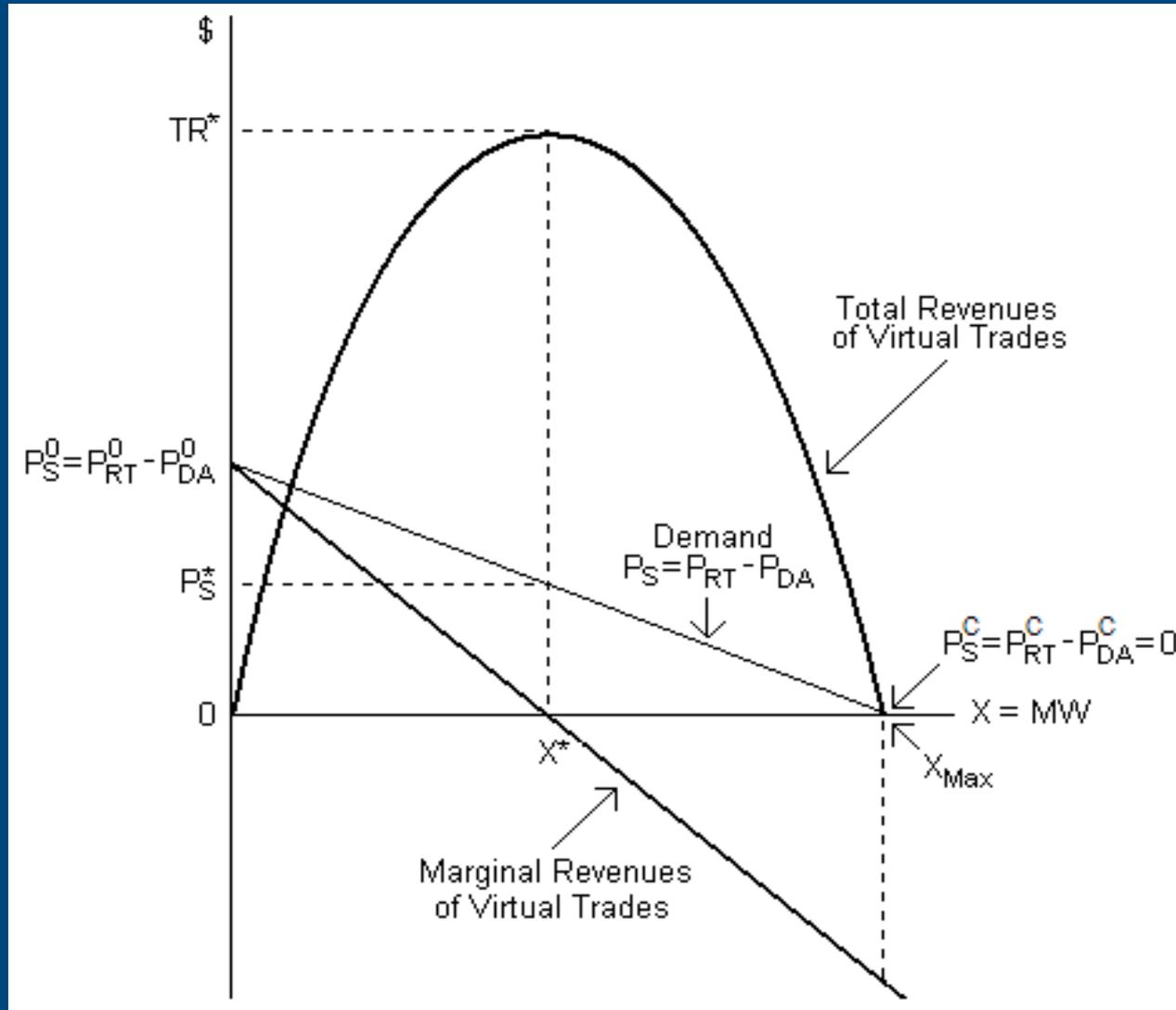
# The economics of trading virtual load

- ◆ Virtual supply and demand (collectively, “virtuals”) are allowed in “Day 2” wholesale electricity markets to give market participants the ability to hedge or speculate on price differences between the day ahead and real time markets at a particular location
- ◆ A Trader bids DEC at a location if it believes that the day ahead LMP will clear below the real time LMP in a given hour at that same location
  - The Trader essentially buys MW in the day ahead market, then sells them back to itself in the real time market
  - Payment to a DEC bid =  $(LMP_{RT} - LMP_{DA}) * MW$
  - Physical market participants hedge against risk in the real time market, such as a generator wishing to protect against the risk of a unit outage
  - Non-physical players seek the profit potential (and associated risk)
- ◆ However, DECs tend to raise congestion prices in the day ahead market and to lower congestion prices in the real time market
  - Therefore, DECs are price setting transactions
  - This benefits the market if it converges the day ahead and real time prices
  - It can also be used to trigger a market manipulation

# The convergence principle of virtual bidding



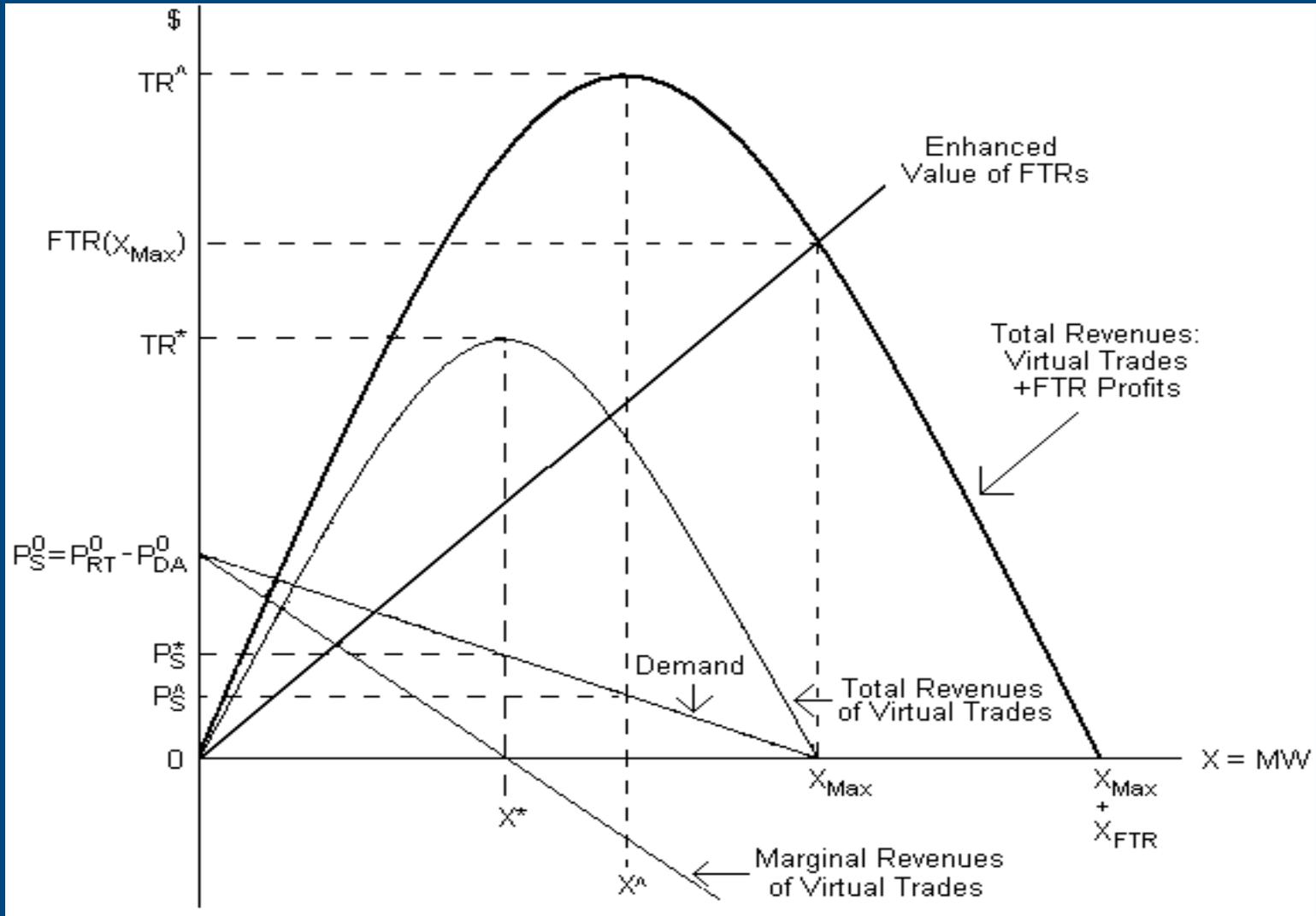
# The derived demand for decremental bids



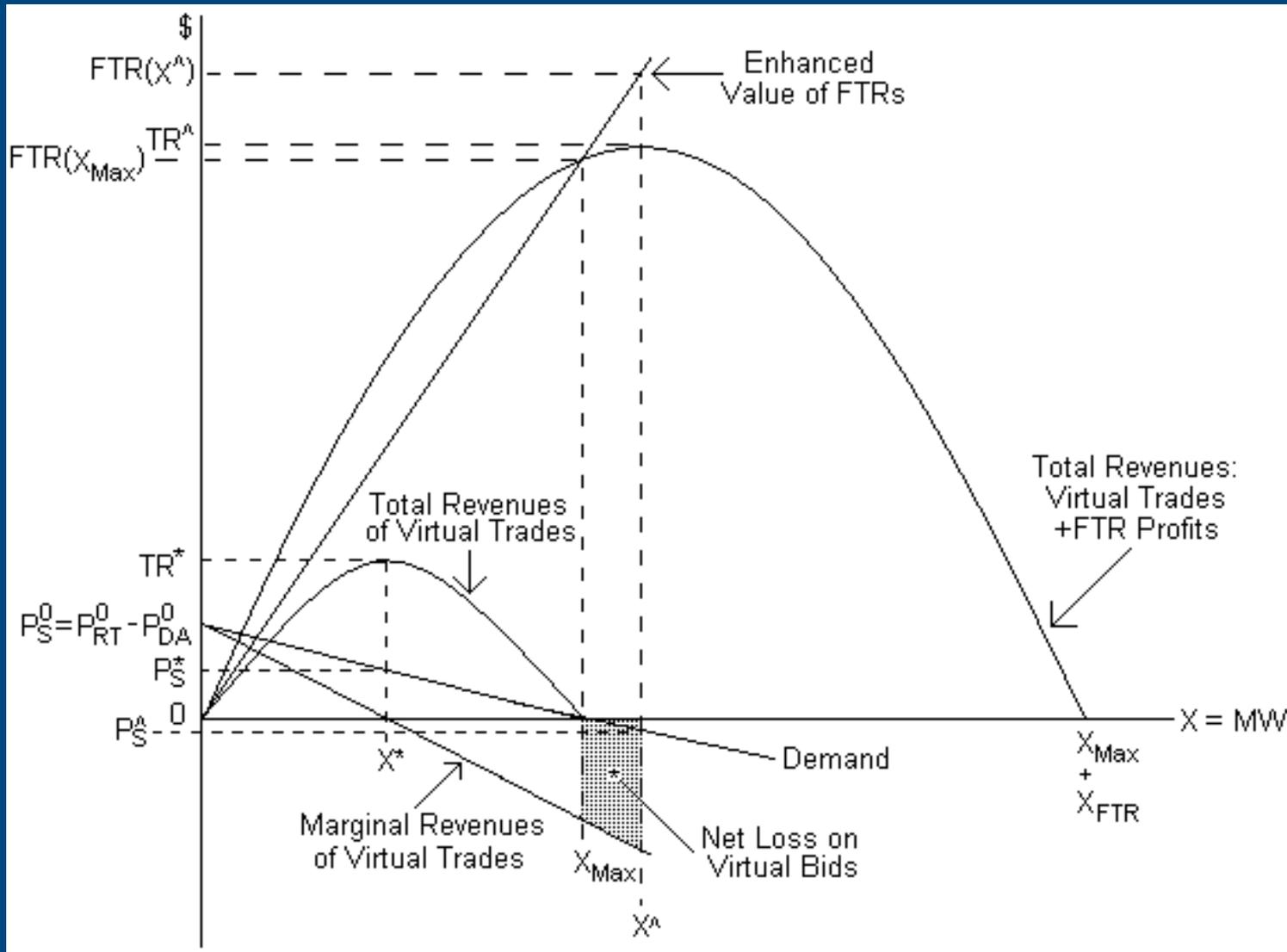
# The effect of adding FTRs to the virtual trader's portfolio

- ◆ FTRs (a.k.a. “CRRs” or “TCCs”) give market participants in “Day 2” wholesale electricity markets the ability to hedge or speculate on price differences between the day ahead prices at two locations
  - A FTR pays its holder the difference in the day ahead congestion prices between the FTR’s “source” and “sink”
  - Payment to the FTR =  $(P_{\text{sink}} - P_{\text{source}}) * \text{MW}$
  - FTRs are price taking instruments
- ◆ FTRs can be used as a hedge for physical players or as a speculative investment
  - Original purpose of FTRs was to provide load serving utilities a hedge to competitive congestion prices between their generator (the “source”) and load (the “sink”)
  - Some FTRs are still allocated to physical market participants for this purpose
  - Non-physical players also buy FTRs for their associated risks and rewards
- ◆ However, if the FTR sinks at the same point where the virtual Trader is placing DEC, the value of the FTR will progressively increase as more DECs clear due to an increase in the day ahead congestion price at that point
  - Thus, FTRs can be the target of a market manipulation triggered by the DEC bids
  - The nexus is self-evident, as the day ahead congestion price component of the total LMP at the FTR’s sink is the link between the manipulation trigger and target

# Placing DEC at sink increases FTR value



# Greater FTR leverage incents virtual losses



# The model applied to Constellation's alleged manipulation

- ◆ Constellation Energy Commodities Group was accused of using uneconomic virtual and physical energy trades to manipulate the value of FTRs and other financial swaps:
  - Triggers: Intentionally-placed uneconomic virtual and physical trades in the NYISO, ISO-NE, PJM and IESO (not jurisdictional)
  - Targets: FTR and other swaps positions tied to nodal, zonal and hub-based LMPs within and across these regions
  - Nexuses: The LMPs linking the various triggers and targets
- ◆ The FTR/virtual model shown above mirrors the reasoning described in the Constellation settlement
- ◆ \$245 million in disgorgement and civil penalties awarded
  - \$110 million in disgorgement to the NYISO, ISO-NE and PJM
  - \$135 million in civil penalties
  - Several traders' licenses revoked

## Additional reading

- ◆ “Using Virtual Bids to Manipulate the Value of Financial Transmission Rights.” Presented at the USAEE/IAEE Annual Conference, Austin, TX, 11/7/12. Available at SSRN: <http://ssrn.com/abstract=2050945>
- ◆ “A Framework for Analyzing Market Manipulation.” *Review of Law & Economics*. Volume 8, Issue 1, Pages 253–295, ISSN (Online) 1555-5879, DOI: 10.1515/1555-5879.1577, September 2012
- ◆ “A Comparison of Anti-Manipulation Rules in U.S. and EU Electricity and Natural Gas Markets: A Proposal for a Common Standard.” *Energy Law Journal* , Volume 33, p.1, April 2012
- ◆ Other documents are available at Dr. Ledgerwood’s web site at <http://www.brattle.com/Experts/ExpertDetail.asp?ExpertID=244>

# Speaker Bio and Contact Information



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Dr. Ledgerwood specializes in issues of market competitiveness with an emphasis on the economic analysis of market manipulation. He previously served as an economist and attorney for the FERC in its enforcement proceedings involving Energy Transfer Partners, L.P. and Amaranth Advisors, LLC. He has built upon these experiences to develop a framework for defining, detecting and analyzing manipulative behavior. He has worked as a professor, economic consultant, attorney, and market advisor to the regulated industries for over twenty years, focusing on issues including ratemaking, power supply, resource planning, and electric asset valuations. In his broader practice, he specializes on issues in the analysis of liability and damages for actions based in tort, contract or fraud. He has testified as an expert witness before state utility commissions and in federal court.

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