



# Market Power in Electricity Generation

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# Some wise words

- "20% of the regulated population will automatically comply with any regulation, 5% will attempt to evade it; and the remaining 75% will comply as long as they think 5% will be caught and punished"

*US Administrator of civilian price controls during WWII*

- "the methods and techniques of manipulation are limited only by the ingenuity of man"

*Cargill vs Hardin (8<sup>th</sup> Cir 1971)*

- "Achieving compliance, is the central goal of the Commission's enforcement efforts."

FERC, Compliance



# What is market power

- "Market power refers to the ability of a firm (or group of firms) to raise and maintain price above the level that would prevail under competition is referred to as market or monopoly power. The exercise of market power leads to reduced output and loss of economic welfare. "

OECD Glossary of Statistical Terms



# Definitions

- Price manipulation is intentional conduct that causes market prices to diverge from their competitive level
  - Action based manipulation
  - Information based manipulation
  - Trade based manipulation
- But what happens if no harm is produced or no action happened

# Trading Strategies (!) - Enron Era

<b>Strategy</b>	<b>Category</b>	<b>Discussed in Enron Memos</b>	<b>Discussed in ISO DMA Reports</b>	<b>Discussed in FERC Staff Final Report</b>
Export of CA Power	Energy market trading	✓	✓	✓
Ricochet (Megawatt Laundering)	Energy market trading	✓	✓	✓
Underscheduling by Utilities	Energy market trading	✓	✓	✓
Fat Boy ("Inc-ing" Load)	Energy market trading	✓	✓	✓
Load Shift	Congestion relief	✓	✓	✓
Death Star (Circular Schedules)	Congestion relief	✓	✓	✓
Wheel Out	Congestion relief	✓	✓	✓
Non-Firm Export	Congestion relief	✓	✓	✓
Scheduling to Collect Congestion Charges	Congestion relief	✓	✓	
Get Shorty	Ancillary services	✓	✓	✓
Selling Non-Firm as Firm	Ancillary services	✓	✓	✓

# Trading strategies

- Ricochet strategy involves scheduling exports on a day-ahead or hour-ahead basis and re-importing the power for sale in real time or out of market in order to evade price caps or reporting requirements.
- Underscheduling: shifting demand from the PX market to the ISO real-time market, where prices were capped
- Fat Boy (or Inc-ing Load): Overscheduling load with the Cal ISO on a day-ahead or hour-ahead basis in order to be paid for excess generation in real-time

# Congestion Relief Strategies

- Congestion relief strategies: the ISO generally did not rescind congestion payments for energy flows that were not actually provided in real-time
- Load shift is a scheduling and bidding strategy designed to maximize the value of financial congestion compensations
- Death star: the ultimate source and sink for the energy are the same such that no energy need flow. The key is that one of these schedules is on a congested line in the opposite direction of congestion so that a congestion relief payment is received
- Wheel-out: when the schedules are submitted, the traders know that the line capacity is zero and thus are certain that the schedules will be cut in real time. Due to this software flaw, the entity receives a congestion payment while never having to supply the energy.
- Non-Firm Export: scheduling a non-firm energy (energy not backed by reserves) export from California to earn congestion relief payments with no intention of actually exporting the energy.

# Ancillary Services

- Get Shorty: Get Shorty involves selling ancillary services short in the day-ahead ancillary services market with the hope of buying them back at a lower price in the hour-ahead market. The ISO tariff recognizes the buyback of ancillary services as a legitimate form of arbitrage. What differentiates Get Shorty from legitimate buyback is that the selling entity never possessed the reserve energy and had no intention of ever supplying it. For this reason, this is referred to as paper trading of ancillary services
- Selling non-firm as firm energy: Since firm energy includes ancillary services and non-firm energy does not, a seller of non-firm energy would be charged for ancillary services.



# What are the essentials

National Law & Framework

Electricity markets

Court decisions



# In generation market

- Withholding capacity (most popular)
- Congestion abuses
- Outage data
- Phantom ancillary services
- Misinformation
- Cross-market manipulation
- Financial manipulation
- Software hacks (optimization algorithm)



## Will a bunch of metrics reveal market power?

- Yes/No
- European experience shows methodological approaches (not quite) do the job
- Rule should be "principles based"
- Cautiously use machine learning algorithms
  - May embed the manipulative behaviour

# What regulators seek

- Market power(abuse or exercise)
  - Withholding supply
    - Physical
    - Economic
- Market manipulation (defraud, untrue statements, fraud)
  - False or misleading transactions
  - Price positioning
  - Transactions involving fictitious devices or deception
  - Dissemination of false and misleading information
  - Many forms but:
    - Benefited trading in related markets
    - Gaming of Market rules



# Not one tool works

- Data Analytics Unit
- Whistleblower & full anonymity
- Self reporting
- Other agencies

# Different & evolving approaches

- Europe
  - EOn (Abuse of dominance – Withholding capacity)
  - GDF Suez – E.On - agreed not to sell in others market
- UK (SSE & Scottish power – withholding capacity)
- Spain (Iberdrola – withholding capacity @ day ahead)
- US
  - Western Energy Crises
  - After EPA Act of 2005
- Canada
  - Alberta (TransAlta – intentionally removed gen plants)
  - Ontario (Goreway - overcharge)



# US

- US – California Energy Crises (2000)
  - April-December 2000, wholesale prices +800%
- 2003 Northeast blackout
- 2005 the Energy Policy Act – (Anti Manipulation Authority)
- 2006 FERC – Order 670 : prohibited market manipulation

# Staff White Paper

- Broad Definition of Fraud: Fraud is a question of fact and is defined generally “to include any action, transaction, or conspiracy for the purpose of impairing, obstructing or defeating a well-functioning market.”
- Fraud Includes Open -Market Transactions Executed With Manipulative Intent: The Commission has held, and a United States district court has confirmed, that fraud under the Anti-Manipulation Rule includes open-market transactions, i.e., transactions occurring on public trading platforms or exchanges, executed with manipulative intent.
- Fraud Is Not Limited to Tariff and Other Explicit Rule Violations: Fraud is determined by all the circumstances of a case, “not by a mechanical rule limiting manipulation to tariff violations.
- Artificial Price is Not Required: A finding of fraud under the Anti-Manipulation Rule does not require proof that the conduct resulted in an artificial price. •
- Harm is Not Required: The Anti-Manipulation Rule contemplates cases based on attempted fraud.
- Proof of Scienter from Circumstantial Evidence: Proof of scienter under the Anti-Manipulation Rule does not require speaking documents or other types of direct evidence. Instead, it can be “established by legitimate inferences from circumstantial evidence. These inferences are based on the common knowledge of the motives and intentions of men in like circumstances.”
- Jurisdiction over Conduct Affecting FERC-Jurisdictional Transactions: Under its “in connection with” jurisdiction, the Commission can exercise jurisdiction over conduct that affects a jurisdictional transaction
- Individuals are “Entities” Subject to the Anti-Manipulation Rule: The Commission and multiple United States district courts have decided that individuals count as “entities” subject to the Anti-Manipulation Rule



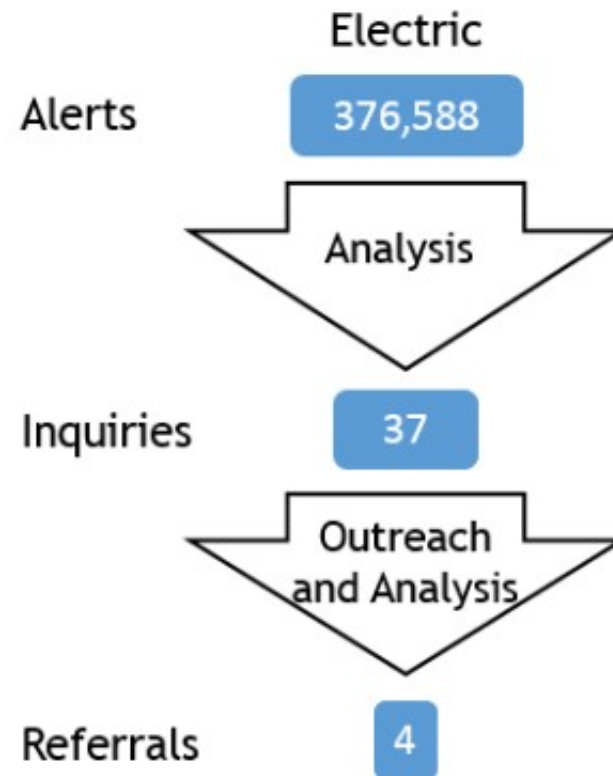
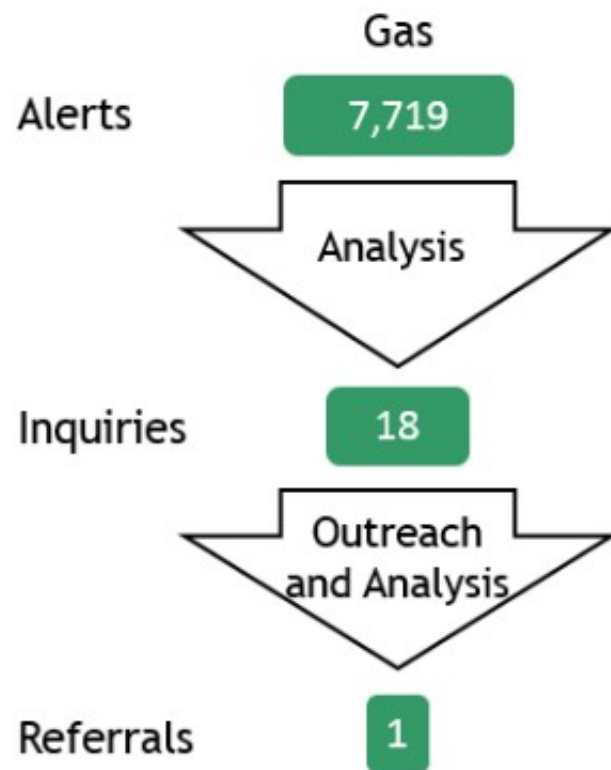
# Examples (2018)

- Wheelabrator Claremont Company, L.P.: continuing to collect Forward Capacity payments for a resource even after that resource had been closed permanently.
- Entergy Nuclear Power Marketing:
  - 1) failed to timely act in response to a natural gas pipeline notice restricting interruptible fuel transportation service, leading ENPM to have insufficient fuel to meet dispatch instructions at one gas-fired power plant, and
  - 2) failed to timely update its open supply offer or otherwise notify ISO-NE of its potential inability to meet dispatch instructions after the notice was issued
- Footprint Power LLC:
  - misleading supply offers and false or misleading and/or omitting material information about Footprint's capacity resource
- Duke Energy
  - fully and accurately communicate information to the Commission relating to certain transmission studies submitted in support of their application for the merger of Duke and Progress Energy, Inc. in violation
- PSEG Energy : incorrect cost-based offers into the PJM energy market between 2005 and 2014.

# Division of Analytics and Surveillance

- develops surveillance tools, conducts surveillance, and analyzes transactional and market data to detect potential manipulation, anticompetitive behavior, and other anomalous activities in the energy markets
- focuses on:
  - (1) natural gas surveillance; (2) electric surveillance; and (3) analytics for reviewing market participant behavior
- seven gigabytes of data in more than 1,200 tables each day from the six organized markets combined

# Layers





# In electricity markets

- (1) uneconomic virtual transactions by node, zone, and constraint;
- (2) day-ahead and real-time market congestion manipulation that would benefit financial transmission rights, synthetic real-time financial transmission rights, swap-futures positions for physical load and generation portfolios;
- (3) anomalies in physical offer patterns;
- (4) abnormal out-of-market payments;
- (5) irregularities in capacity market sell offers;
- (6) loss making physical fixed-price offer strategies in bilateral electricity markets


# Gaming of market rules

- "behaviour that circumvents or takes unfair advantage of Market Rules or conditions in a deceptive manner that harms the proper functioning of the market and potentially other market participants and consumers" (FERC)
    - A defect or gap in the market design, rules or procedures
    - Exploitation of the market defect by a market participant
    - Profit or benefit to the participant
    - Expense or disadvantage to the market
- (Ontario MSP)

# Penalty matrix – IESO (Ontario)

Impact Level		Non-Compliance Level (Severity and Breach History)							
		Low		Moderate		High		Severe	
		Range Limit		Range Limit		Range Limit		Range Limit	
		Min	Max	Min	Max	Min	Max	Min	Max
<b>Low</b>	Little or None	\$2,000	\$25,000	\$2,000	\$50,000	\$3,000	\$75,000	\$5,000	\$100,000
<b>Medium</b>	Material	\$2,000	\$100,000	\$4,000	\$250,000	\$6,000	\$450,000	\$10,000	\$600,000
<b>High</b>	Severe	\$4,000	\$250,000	\$8,000	\$500,000	\$12,000	\$750,000	\$20,000	\$1,000,000

Note: matrix can be used to assess penalties on a per breach basis or as one aggregated breach.



Thank you  
Questions

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