The Role Of The Independent Market Monitor

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Wisconsin Public Utility Institute
Energy Utility Basics

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Objectives

- The Role of the Market Monitor
  - To understand the need, our areas of focus, and how we accomplish our objectives.

- Characteristics of Electric Power Supply Curves
  - To understand that large power markets generally have adequate competition when there are no transmission constraints

- Power Generation Costs
  - To understand what costs are expected to be in a competitive supply curve

- Market Power Abuse
  - To understand how market power abuse affects market prices

- Market Monitoring Activities
  - To understand how market power abuse is detected and the actions taken to mitigate it
The Role of Market Monitoring

- Deregulation is premised on the benefits of replacing regulation with competition to guide generation and transmission usage, and investment.
- Under the Federal Power Act, wholesale prices must be “just and reasonable”.
- FERC relies on competition to ensure just and reasonable prices.
  - In centralized markets, market monitoring and mitigation measures address potential market power concerns.
  - In the Energy Policy Act of 2005, FERC acquired significant authority to sanction participants for market manipulation.
The Focus of Market Monitoring

- The Market Monitor identifies:
  - Flaws in market rules that create inefficient incentives or gaming opportunities;
  - Improvements in the operation of the market;
  - Market power abuses;

- Market efficiency and market power generally receive equal monitoring attention – contrary to the assumption of most that market power is the primary focus.
Independent Market Monitoring

• Early markets relied on RTO employees to perform market monitoring:
  ✓ The PJM market monitoring unit was internal to PJM but transitioned to an independent entity.
  ✓ New York, New England and California have an internal MMU to do day-to-day monitoring and an external monitor doing periodic reports.

• Independence of the Market Monitor from the RTO is important due in part to its role in monitoring the RTO’s operations.

• The Midwest ISO maintains this independence by retaining an Independent Market Monitor (“IMM”) to perform the monitoring.
  ✓ Potomac Economics serves as the Midwest ISO’s IMM.
  ✓ We report to FERC and the MISO Board of Directors.
Market Monitoring Functions

• The monitoring function includes:
  ✓ Real-time screening and analysis to identify circumstances that require further investigation – we receive data continuously from the MISO;
  ✓ Investigations of market operations or conduct identified through the daily screening or complaint processes; and
  ✓ Periodic analysis and reporting.

• The IMM is also primarily responsible for developing the systems to ensure that the market power mitigation measures are triggered in accordance with the MISO tariff.

• This requires an interdisciplinary team of experts and the development of extensive market monitoring software.
Market Monitoring Team

• The team of professionals is in place to monitoring the MISO markets, including electrical engineers, economists, other analysts and programmers.

• Most of the team is located in at Potomac Economics’ offices in Virginia, with the exception of two software engineers in Ohio and me in the MISO operations center.

• I am an engineer with a background in generation operations, power marketing, and a NERC certification in transmission operations.
  ✓ As a member of the market monitoring team for MISO, I interface directly with the MISO operators as necessary;
  ✓ Perform investigations of generator operations, outages, transmission operations, and other operational issues; and
  ✓ Produce market analyses for the periodic market monitoring reports.
Market Power

- Market power is the ability of a firm to profitably raise prices above competitive levels (SMD NOPR).
- In general, it is far more costly to eliminate all market power than to allow some market power to exit.
- Markets for electricity vary with market conditions due to the lack of storage and reliance on the physical transmission network.
- Market power in electric markets is generally transitory, related to transmission constraints that isolate narrow market areas.
  - All RTOs have some form of mitigation to address market power associated with transmission constraints.
What Conduct May Indicate an Attempt to Exercise Market Power?

- Price fluctuations are not the primary indicator.
- The key to differentiating between market power and scarcity is to determine whether resources are being withheld from the market:
  - Physical withholding – withdrawing or derating an economic unit.
  - Economic withholding – raising a generator bid so as not to run or raise the clearing price.
- Focusing on withholding from the spot market is the appropriate focus for monitoring since the spot market will discipline the forward markets.
- Other forms of strategic conduct include:
  - Creating congestion through a) outages of transmission; b) understating transmission ratings/capacity; or c) uneconomic dispatch of generation.
  - Conduct by utilities or transmission owners to depress prices (e.g., unjustified out-of-merit dispatch).
## Generation Costs for Typical Coal Plant

### $/MWhr

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel</td>
<td>16.00</td>
</tr>
<tr>
<td>Emissions</td>
<td>7.00</td>
</tr>
<tr>
<td>Parts and materials</td>
<td>3.00</td>
</tr>
<tr>
<td><strong>Variable Costs</strong></td>
<td><strong>26.00</strong></td>
</tr>
<tr>
<td>Labor</td>
<td>2.00</td>
</tr>
<tr>
<td>Taxes and insurance</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Variable plus Semi Fixed</strong></td>
<td><strong>29.00</strong></td>
</tr>
<tr>
<td>Capital</td>
<td>9.00</td>
</tr>
<tr>
<td>Property taxes</td>
<td>2.00</td>
</tr>
<tr>
<td>Admin and overhead</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td><strong>41.00</strong></td>
</tr>
</tbody>
</table>
The marginal cost of an additional unit of output is the cost of the additional inputs needed to produce that output.

- More formally, the marginal cost is the derivative of total production costs with respect to the level of output.

- Marginal cost and average cost can differ greatly.
  - For example, suppose it costs $1000 to produce 100 units and $1020 to produce 101 units.
  - The average cost per unit is $10, but the marginal cost of the 101st unit is $20.

- Marginal costs include opportunity cost, risks and other factors that can cause marginal costs to exceed incremental production costs.

**Marginal Cost (Incremental Costs)**
Average vs. Incremental Costs
Typical Gas Combined Cycle Plant
Unconstrained Supply Curve
Marginal Cost vs. Capacity
1,400 Plants controlled by 113 Market Participants
Constrained Supply Curve
Market Power With Competitive Conduct

![Graph showing cost vs. capacity for Company A and Company B, with a dotted line indicating demand and market price at a certain capacity level.](graph.png)
Measure of Market Concentration
Herfindahl-Hirschman Index - HHI

Ranges per US Department of Justice
Constrained Supply Curve
Market Power Abuse
Price increases from $40 to $149
Constrained Supply Curve
Market Power With Competitive Conduct
Constrained Supply Curve
Market Power Abuse
Prices increased from $150 to $190

Demand

Market Price

Cost ($/MWhr)

Market Power Offer Increase
Company B
Company A

Capacity (MW)
Market Impact of Uneconomic Production

Distant Market Wide Generation

Low Capacity Line

High Capacity Line

High Capacity Line

Demand Center

constraint

Gen
Mitigating Market Power

- Market power is the ability to profitably raise the price of a product;
- The first and best form of mitigation is to address the structural characteristics of the market:
  ✓ Promoting transmission investments to reduce congestion and associated locational market power;
  ✓ Remove barriers to investment in new generation;
  ✓ Facilitating demand-side participation in the market; and
  ✓ Divestiture: reducing concentration of supply ownership.
- Even with the structural mitigation, market power concerns may still justify “behavioral” mitigation.
- Behavior mitigation includes measures that restricts a supplier from exercising market power.
Market Mitigation Activities

• Consistent with the definition of market power, mitigation is only applied when a conduct and market impact test are satisfied:
  ✓ Conduct test: supplier is withholding generation
  ✓ Impact test: Identified conduct is raising prices significantly

• Criteria used to implement mitigation
  ✓ Area impacted by transmission constraints
  ✓ Conduct
    – Economic withholding
      • Offer greater than benchmark + $100/MWhr
      • Offer greater than benchmark + $48/MWhr (WUMS)
    – Uneconomic production
      • Operate at less then ½ cost
  ✓ Impact
    – Prices double or increase by $100/MWhr
    – Prices double or increase by $48/MWhr (WUMS)
Market Mitigation Activities (Continued)

- Mitigation measures
  ✓ Constraining offer from rising above competitive benchmark (non-punitive)
  ✓ Refer conduct to FERC for potential penalties
    – Physical withholding
    – Self-scheduled overproduction

- What is the competitive benchmark for a generator?
  ✓ Minimum of the mean or median of previous 90 days accepted bids while unconstrained, adjusted for fuel price changes
  ✓ Mean LMP of lowest 25% of hours dispatched
  ✓ Cost survey data
  ✓ Consultation for adjustments and exceptions
Questions?