MA Scarcity Pricing Proposal: Overview of Issues/Approach

PA PUC

Howard J. Haas

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Scarcity Pricing: MA position

- **Scarcity pricing is an important part of market design**

- **There must be a real time offset of Energy Scarcity Revenues against Capacity markets revenues**

- **Scarcity pricing does not mean prices over $1,000**

- **There needs to be accurate measurement of reserves before implementing an energy market scarcity mechanism**

- **Scarcity pricing mechanism should provide results that are consistent with least cost security constrained dispatch**

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Scarcity Pricing: MA position

- **One approach is to include reserve targets as constraints in the optimization**

- **Allows the optimization process to arrange energy and reserves from existing resources**

- **Provides locational price signals that are consistent with security constrained dispatch**

- **This approach can be implemented in a variety of ways**

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Differences between MA and PJM pricing approaches

- **Scarcity price level ($1,000 vs. $2,700)**
  - **Price target vs. Fixed adder**

  - **Relaxing the constraint allows more flexibility in price while maintaining dispatch signals**

  - **Consistent with the core ORDC concept**

  - **No evidence to date that prices in excess of $1,000, or resources over $1,000, are needed to maintain reliability**

  - **Policy issue**
    - Consistency with overall market design
    - Market structure compatibility issue with $2,700

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Differences between MA and PJM pricing approaches

- **Offset mechanism**
  - **Immediate offset is cleaner approach**
  - **PJM's approach would allow double collection in a given delivery year**
    - Distorts future prices
      - Affects new entrants, capacity additions, improvements
      - Favor existing generation
    - Increases costs to load

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Differences between MA and PJM pricing approaches

- **Treatment of Emergency Resources**
  - **Emergency Demand Response (Capacity)**
    - MA approach: Only dispatchable economic DR with a bus location and telemetry can set price (current tariff rule)
    - PJM approach: Can set price
      - Market Power Concerns under PJM approach
      - Dispatch concerns under PJM approach

  - **Emergency Purchases**
    - MA approach: Cannot set price (current rules)
    - PJM approach: Can set price
      - Market Power Concerns under PJM approach

  - **Capacity Recall**
    - RPM capacity resource obligations

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Differences between MA and PJM pricing approaches

- **One or two reserve targets**
  - **MA proposes one (Sync)**
  - **ORDC (either MA or PJM) approach can handle one or two (or more)**
  - **Measurement issue needs to be resolved**
  - **PJM has not resolved measurement issue yet**
- **Structure of Tier 2 market**
  - **Hour ahead market structure and 5 minute optimization (MA) vs. "inflexible resource" hour ahead commitment and 5 minute only pricing (PJM)**
    - Limiting compensation to 5 minute optimization/hourly integrated pricing may reduce reserves/participation

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Challenge under either approach

- **Measurement of reserves**

- **Morning pickup/min gen events**
  - **Relaxing the constraint will work**
  - **Issues:**
    - Need rules around when to trigger price effects under either approach
    - Frequency of events

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Scarcity Revenue Offset

The RTO or ISO must describe how its proposal would (Order 719, @248):

- "Under the revised criteria, we expect an RTO or ISO to explain how its market rules will reduce or avoid periods of operating reserve shortages as well as how its market rules will reliably reduce demand and increase generation during periods of operating reserve shortage. Nothing in this Final Rule dictates the particular market rules or mechanisms an RTO or ISO must adopt. <u>For example, we do not require regions that have not adopted a capacity market to develop such markets.</u>"

The RTO or ISO must describe how its proposal would (Order 719, @248):

- **FERC has recognized that scarcity pricing and capacity markets perform the same function:**

  - **Ensuring enough reserves**
  - **Ensuring sufficient revenues to provide for required reserves**

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Scarcity/Shortage Revenues

- **Scarcity Revenues can be collected via the energy market, the capacity market or some combination**

- **Need an effective revenue offset mechanism to prevent double recovery**

- **Maintaining a reserve requirement requires administrative intervention**
  - **Capacity Market**
  - **Scarcity Pricing**

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Scarcity/Shortage Revenues

- **RPM revenues are scarcity revenues**
  - **Designed to provide incentive to build and maintain peaking units**
  - **Designed to cover fixed costs of peaking units**
  - **Designed to provide price signal to reduce peak load**
  - **Designed to provide performance incentive to units**
  - **Designed to smooth boom and bust cycle**

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Scarcity/Shortage Revenues

- **Under the Operating Reserve Approach:**
  - **"Scarcity Adder" is an administrative contribution to marginal bus LMP(s) when short one or more reserve products**
    - **LMP = Energy + Marginal Losses + Congestion + "Scarcity Adder"**
  - **Scarcity revenues are those revenues directly attributable to the scarcity price adder contributions to the marginal unit LMP during a reserve shortage**
    - **Bus specific effects on LMP and revenues**

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Concepts to Date

- **Historical Three Year Average (no real time offset)**
  - **Any event affects 3 years of subsequent auctions**
    - **CONE unit offset**
    - **Actual net revenue offset for ACR**
- **Perfect real time offset:**
  - **RPM resources do not receive energy market scarcity revenues**
  - **Offset in same delivery year as event**
- **Modified real time offset:**
  - **RPM resources keep only energy market scarcity revenues that exceed, on a cumulative basis, the RPM $MW/day scarcity payment for the delivery year/operating year in question**

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Historical Three Year Average

- **With scarcity pricing mechanism, will cause lumpiness in revenues/disruption of signal**
  - **Scarcity events will causes over collection of scarcity revenue in a given operating year**
    - **Increase costs to load in delivery year**
    - **Payback distributed over three years, starting four years after the event—payback/charges not in the same proportion to the same participants**
  - **Causes under collection in subsequent years**
    - **Would decrease generation payments, all else held equal, starting 4 years after a shortage event**
    - **Lower price signal for new entrants/capacity additions**

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Perfect Real Time Offset

- **Prevents over collection of scarcity revenue in operating year**
  - **Marginal incentives consistent with real time performance**

- **Maintains viability of long term RPM price signal**

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Advantages of MA Proposal

- **Minimizes over collection of scarcity revenue**
  - **Provides incentives for real time performance**

- **Maintains viability of long term RPM price signal**
  - **Allows the market to correct for potential planning errors**

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MA Scarcity Pricing Proposal:
Price Targets and Related Issues

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MA vs. PJM approach: $1,000 vs. $2,700

Market Design Issues ($1,000 vs. $2,700)	MA	PJM
Market Results compatible with PJM's current market rules/caps	Yes	Not in scarcity
Compatible with RT/DA market design (arbitrage, scheduling)	Yes	No
Would require changes to DA market/Design/Rules	No	Yes
Market Power concerns w/ DA Market Fixes	No	Yes
Internally consistent rules during a transition	Yes	No

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Pricing Under Scarcity: $1,000 vs. $2,700

- **No evidence that the scarcity signal in the energy market must exceed $1,000 in order to maintain reliability**

- **PJM has maintained reliability with energy prices capped at $1,000**

- **PJM has and continues to plan reliability requirements based on resources available at prices below $1,000**

- **PJM has not indicated that current operations are unreliable due to effective energy caps of $1,000**

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Pricing Under Scarcity: $1,000 vs. $2,700

- **Capping the market price at $1,000**
  - **Allows participants to better manage risks in DA market**
    - ○ **Missed load prediction**
    - ○ **Tripped unit**
  - **Is consistent with PJM's current market design**
    - ○ **$2,700 in RT is not consistent with PJM's current market design and offer caps**
  - **Does not require reworking of the DA market**
  - **Would set LMP consistently with current resource offer caps and current market design**
  - **Would ensure full resource stack is dispatched**

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MA issue with PJM Day Ahead Market "Fix"

- **PJM $2,700 peak real time price proposal has resulted in a PJM proposal to increase INC and DEC offer caps in DA to $2,700**

- **PJM proposed $2,700 peak real time price is creating more problems than it fixes**

  - **Prices in excess of offer caps**

  - **Reasonable offset mechanisms undermined**

  - **Market power issues Day Ahead with proposal to allow $2,700 INC/DEC**

  - **Wealth transfers with no change in resource availability DA (no resources available above $1,000)**

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MA issue with PJM Day Ahead Market "Fix"

- **Objective needs to be competitive behavior and prices in both DA and RT energy markets**
- **Same rules should apply to RT and DA market**
  - **Same offer caps**
  - **DA scarcity pricing mechanism using the same concepts as RT scarcity pricing mechanism**

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