

# Exploring PJM's Paths with Long-Term Hedges

## PREPARED BY

Sam Newell  
Andrew Levitt  
Joe DeLosa III

## PRESENTED TO

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Workshop

## PRESENTED BY

Andrew Levitt

## PREPARED FOR



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# Notice

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# Hedging Path Designs at a Glance

|                         |  Underlying Market Construct and RA Assurance |  Form of Mandatory Hedge |  Interconnection Approach                   |  Transition                                                                                                                                                                                                    |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Path A: Capacity hedges | <b>Capacity market</b><br>(reformed)                                                                                           | <b>Physical UCAP</b><br>Forward purchase of physical UCAP                                                 | <b>Current approach with CIRs</b><br>“Invest-and-connect”<br>(unless heavily reformed)                                         | <b>Phase in hedge requirements</b><br> <b>Ramp up capacity price cap</b>                                                                                                                                       |
| Path C: energy hedges   | <b>Energy-only market plus strategic reserve</b><br>Residual RA needs met and held out of market                               | <b>Financial energy</b><br>E.g., high-strike-price call option                                            | <b>Flexible non-firm approach</b><br>ERCOT-style non-firm interconnection without CIRs, a faster “connect-and-manage” approach | <b>Phase in hedge requirements</b><br> <b>Ramp down capacity price cap</b><br> <b>Add ORDC, ramp up energy price cap</b> |

# Summary Assessment of Path A and Path C

|                                   | Path A: Long-term Capacity Hedges                                                                                                                                               | Path C: Long-term Energy Hedges*                                                                                                                                                                                                                                 |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Viability &amp; Durability</b> |  Weaker fit for long-term contracting                                                          |  Strong foundation for long-term contracting                                                                                                                                  |
| <b>Reliability</b>                |  Maintains today's 1-in-10 approach                                                            |  Achieves comparable reliability assurance, w/ upsides for adaptability and realized reliability                                                                              |
| <b>Economic Efficiency</b>        |  More administrative guide to investment                                                       |   More efficient: rewards performance, lowers barriers, decentralizes investment decisions |
| <b>Alignment with State Goals</b> |  Generally aligned with state goals for affordability and energy transition                   |   Comparable alignment, with flexibility and interconnection advantages                  |
| <b>Practical Implementation</b>   |  Lower implementation burden (subject to reform); more readily fits current state frameworks |  Substantial redesign required                                                                                                                                              |

\*Strategic reserve was not explicitly included in PJM's Path C

# KEY CHALLENGE FOR PATH A (Long-Term Capacity Hedges)

## Managing Definition Risk in Long-Term Capacity Contracts

### KEY CHALLENGE

PJM Powering Reliability paper (Page 28)  
*“Regardless of which path the region chooses, several reforms are overdue and should be explored in parallel: capacity market reforms including seasonal procurement designs and accreditation refinements...”*

### Need to Redefine Capacity (Again, and Again?):

- Seasonal capacity
- Locational capacity? CETL poorly fits hourly RA model; RTO-wide ELCC ignores LDA saturation of storage, solar, load flex

**Arc of RPM Redefinitions:** Base → Capacity Performance → Avg. ELCC → Marginal ELCC →  → Seasonal → Locational? → ?

### SOLUTION ALTERNATIVES



#### Reform Before Contracting

- Seasonal requirements, ELCCs, CETL, clearing
- Locational ELCCs, new CETL method (or make capacity RTO-only, handle locational out of market)

-OR-



#### Reform After Contracting

- Contract could specify who holds definition risk
- May have to do this in any case (**could there be another redefinition in the next ten years?**)

### IMPLICATIONS



#### Contracting Delay or ICAP Contracting

- These reforms are difficult, further reform may be unavoidable
- In the interim, could contract for ICAP (or something else?)

-OR-



#### Risk of Failed or Disrupted Contracting

- Sellers/PJM may be unwilling to hold definition risk
- PJM redefinition of capacity may trigger dispute in a PJM-procured long-term contract for capacity

# KEY CHALLENGE FOR PATH C (Long-Term Energy Hedges)

## Developing the New Market and Hedge Construct

### KEY CHALLENGE

#### Development of New Construct

- New rules for underlying market construct: credit, ORDC, strategic reserve, non-firm interconnection
- Unlike Path A, Path C hedging cannot obviously piggyback off existing capacity mechanisms

▼ - *PARALLEL DEVELOPMENT -* ▼  
*FOR PATH C*

### RULES FOR UNDERLYING MARKET CONSTRUCT



#### Before Contracting: ORDC and Credit Rules

- ORDC, energy price cap schedule, credit rules are fundamental to energy contracts



#### During/After Contracting: Strategic Reserve, Non-Firm Interconnection

- Strategic reserve minimally interacts with markets and can be developed after
- Non-firm interconnection can be pursued now but completed after

### DEVELOPMENT OF HEDGING CONSTRUCTS (STATE & PJM)



#### State Contracting

- Analogous implementation to Path A, can build off default supply procurements
- Choice of non-bypassable hedges or bilateral (risks stranded hedges)
- PJM can assess hedge value of different contract types

#### PJM Contracting

- Standardized energy hedge contract (e.g., high-strike-price call option)
- Can serve as a residual procurement
- Potential for PJM-run procurement of state-specified contracts?

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# Thank you

Read the paper and contact the authors: [Exploring PJM's Paths with Long-Term Hedges](#)

# Appendix: Full Summary Assessment of Path A and Path C

|                                   | Path A: Long-term Capacity Hedges                                                                                                                                                                                                                                                                                                                                                  | Path C: Long-term Energy Hedges                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Viability &amp; Durability</b> | <b>Weaker fit for long-term contracting</b> <ul style="list-style-type: none"> <li>Implements long-term hedges, addressing credibility trap, but with uncertain feasibility and liquidity</li> <li>Presents durability risks during the contract term as the capacity definition and underlying rules evolve (e.g., time periods, accreditation, deliverability)</li> </ul>        | <b>Strong foundation for long-term contracting</b> <ul style="list-style-type: none"> <li>Implements long-term hedges, addressing credibility trap, but with uncertain feasibility and liquidity</li> <li>Uses energy as a more concrete, stable product for a long-term hedge</li> </ul>                                                                                                                                                  |
| <b>Reliability</b>                | <b>Maintains today's 1-in-10 approach</b> (but more supportive of investment) <ul style="list-style-type: none"> <li>Continues to procure target reserve margin via status quo capacity market, with price cap slowly rising</li> <li>Supports performance via E&amp;AS prices and CP penalties</li> </ul>                                                                         | <b>Achieves comparable reliability assurance, w/ upsides for adaptability and realized reliability</b> <ul style="list-style-type: none"> <li>Procures to the target via strategic reserve</li> <li>Strengthens performance incentives through higher E&amp;AS scarcity prices</li> <li>Could relieve tightness through faster energy-only interconnection and more demand engagement</li> </ul>                                           |
| <b>Economic Efficiency</b>        | <b>More administrative guide to investment</b> <ul style="list-style-type: none"> <li>Uses uniform capacity signals, accreditation, and deliverability rules</li> <li>May better suit demand response under equilibrium conditions</li> <li>Administrative rules can constrain ill-fitting resources</li> <li>Existing CIR model slows efficient entry, unless reformed</li> </ul> | <b>More efficient: rewards performance, lowers barriers, decentralizes investment decisions</b> <ul style="list-style-type: none"> <li>Strengthens incentives to perform during scarcity</li> <li>Lets investors (and state planners) trade off firmness, speed, duration, and cost</li> <li>Enables flexible demand to respond according to willingness to pay</li> <li>Supports faster entry through non-firm interconnection</li> </ul> |
| <b>Alignment with State Goals</b> | <b>Generally aligned with state goals for affordability and energy transition</b> <ul style="list-style-type: none"> <li>Can limit bill impacts by gradually increasing capacity prices</li> <li>Can accommodate state procurements of preferred resources (albeit with reform potentially needed for greater decarbonization)</li> </ul>                                          | <b>Comparable alignment, with flexibility and interconnection advantages</b> <ul style="list-style-type: none"> <li>Can limit near-term bill impacts by gradually decreasing capacity prices while increasing energy scarcity pricing</li> <li>Can accommodate state procurements</li> <li>Requires less transmission for firm decarbonized resource mix</li> </ul>                                                                        |
| <b>Practical Implementation</b>   | <b>Lower implementation burden, more readily fits current state frameworks</b> <ul style="list-style-type: none"> <li>Can leverage existing capacity market mechanisms for the new hedge procurement and allocation mechanism</li> <li>Capacity is already embedded in retail rates, state procurement programs, etc.</li> </ul>                                                   | <b>Substantial redesign required</b> <ul style="list-style-type: none"> <li>Relies on novel hedge procurement and allocation mechanisms</li> <li>Also requires major changes to the underlying market construct: enhanced energy-market design, credit rules, strategic reserve, market power mitigation, and interconnection criteria</li> </ul>                                                                                          |