Exploring PJM's Paths with Long-Term Hedges

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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	**Capacity market** (reformed)	**Physical UCAP** Forward purchase of physical UCAP	**Current approach with CIRs** "Invest-and-connect" (unless heavily reformed)	**Phase in hedge requirements** ▲ **Ramp up capacity price cap**
Path C: energy hedges	**Energy-only market plus strategic reserve** Residual RA needs met and held out of market	**Financial energy** E.g., high-strike-price call option	**Flexible non-firm approach** ERCOT-style non-firm interconnection without CIRs, a faster "connect-and-manage" approach	**Phase in hedge requirements** ▼ **Ramp down capacity price cap** ▲ **Add ORDC, ramp up energy price cap**

Summary Assessment of Path A and Path C

	Path A: Long-term Capacity Hedges		Path C: Long-term Energy Hedges*	
Viability & Durability	~	Weaker fit for long-term contracting	✓	Strong foundation for long-term contracting
Reliability	✓	Maintains today's 1-in-10 approach	✓	Achieves comparable reliability assurance, w/ upsides for adaptability and realized reliability
Economic Efficiency	✓	More administrative guide to investment	✓ ✓	More efficient: rewards performance, lowers barriers, decentralizes investment decisions
Alignment with State Goals	✓	Generally aligned with state goals for affordability and energy transition	✓ ✓	Comparable alignment, with flexibility and interconnection advantages
Practical Implementation	✓	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

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

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..."

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?

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
Viability & Durability	**Weaker fit for long-term contracting** • Implements long-term hedges, addressing credibility trap, but with uncertain feasibility and liquidity • Presents durability risks during the contract term as the capacity definition and underlying rules evolve (e.g., time periods, accreditation, deliverability)	**Strong foundation for long-term contracting** • Implements long-term hedges, addressing credibility trap, but with uncertain feasibility and liquidity • Uses energy as a more concrete, stable product for a long-term hedge
Reliability	**Maintains today's 1-in-10 approach** (but more supportive of investment) • Continues to procure target reserve margin via status quo capacity market, with price cap slowly rising • Supports performance via E&AS prices and CP penalties	**Achieves comparable reliability assurance, w/ upsides for adaptability and realized reliability** • Procures to the target via strategic reserve • Strengthens performance incentives through higher E&AS scarcity prices • Could relieve tightness through faster energy-only interconnection and more demand engagement
Economic Efficiency	**More administrative guide to investment** • Uses uniform capacity signals, accreditation, and deliverability rules • May better suit demand response under equilibrium conditions • Administrative rules can constrain ill-fitting resources • Existing CIR model slows efficient entry, unless reformed	**More efficient: rewards performance, lowers barriers, decentralizes investment decisions** • Strengthens incentives to perform during scarcity • Lets investors (and state planners) trade off firmness, speed, duration, and cost • Enables flexible demand to respond according to willingness to pay • Supports faster entry through non-firm interconnection
Alignment with State Goals	**Generally aligned with state goals for affordability and energy transition** • Can limit bill impacts by gradually increasing capacity prices • Can accommodate state procurements of preferred resources (albeit with reform potentially needed for greater decarbonization)	**Comparable alignment, with flexibility and interconnection advantages** • Can limit near-term bill impacts by gradually decreasing capacity prices while increasing energy scarcity pricing • Can accommodate state procurements • Requires less transmission for firm decarbonized resource mix
Practical Implement-ation	**Lower implementation burden, more readily fits current state frameworks** • Can leverage existing capacity market mechanisms for the new hedge procurement and allocation mechanism • Capacity is already embedded in retail rates, state procurement programs, etc.	**Substantial redesign required** • Relies on novel hedge procurement and allocation mechanisms • Also requires major changes to the underlying market construct: enhanced energy-market design, credit rules, strategic reserve, market power mitigation, and interconnection criteria