

# Capacity Market

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Capacity Workshop – Session 1

Feb. 12, 2021

- PJM's capacity market was created to help efficiently deliver resource adequacy on a locational basis and has evolved over time.
- Our resource mix is undergoing significant transition driven by changes in consumer preference, technology and state/federal policy.
- Stakeholders have raised questions about certain aspects of the current market design, some in relation to these trends and others more generally.
- PJM believes now is the time to address these questions.

- It is important to start with what problems we are trying to solve and in what sequence.
- PJM believes the best way to reach durable solutions is through stakeholder consensus and is not here with “the answer.”
- Today, we’re sharing our views to start the conversation.
- Stakeholder input will be key to determine how this evolves.

## Session 1

### Today

PJM to provide historical backdrop, offer its perspectives on the framing of the issue to address and timing

## Session 2

### March 4

Stakeholder input on framing of the issue

## Session 3

### March 12

Stakeholder input on potential market design solutions

## Session 4

### March 26

PJM will provide its feedback around Sessions 2 and 3; PJM will then facilitate a discussion around “next steps”

While difficult to predict, PJM believes there may be a “window” of time for stakeholders to proactively tackle some or all of these questions, and so we have set a compressed time frame for these workshops.



# A Brief History of PJM's Capacity Market

Craig Glazer, VP – Federal Government Policy  
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- Given the 15-year history of RPM, inevitably this presentation may leave out key issues important to different stakeholders.
- Omission of any issues should not reflect on the importance of such issues, but is merely an attempt at clarity and brevity.

## Key Questions

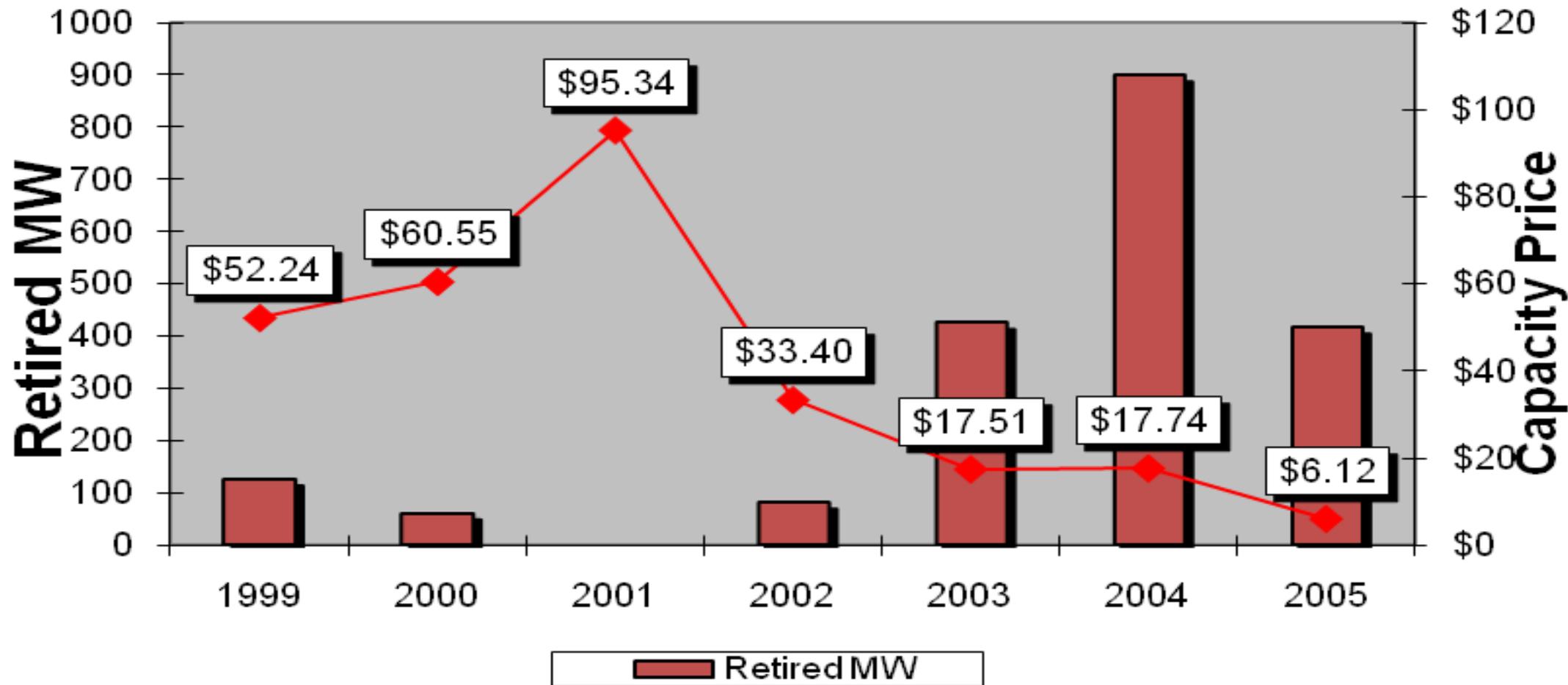
- What problem were we trying to solve in creating RPM? What were the original drivers?
- What were RPM's key components?
- How did regulatory decisions and market changes affect those key components along the way?

## Key Takeaways

- We did not get here overnight.
- Many areas have evolved.
- There is a lot of FERC and court precedent on many aspects of RPM.

- Reliability threatened by declining reserve margins with no clear market signals for entry
- Transmission limitations resulting in locational reliability concerns
- PJM faced with “boom or bust” highly volatile daily capacity market
- Generation retirements due to state environmental laws in some cases
- Generation investment limited due to the lack of a longer-term price signal, particularly in constrained areas

## Decreasing Prices/Increasing Generation Retirement



*“Absent investment in additional generation in eastern PJM or transmission capability to deliver energy to the area, the reliability of that area will be significantly degraded. The area will not be compliant with PJM and MAAC reliability criteria and will face an increased reliance on emergency operating procedures and an unacceptable level of risk of load interruption.*

*With continued load growth and the potential for additional generation retirements, the situation will become more critical in future years ... similar reliability concerns will arise in several other areas of the PJM Region in the near future.”*

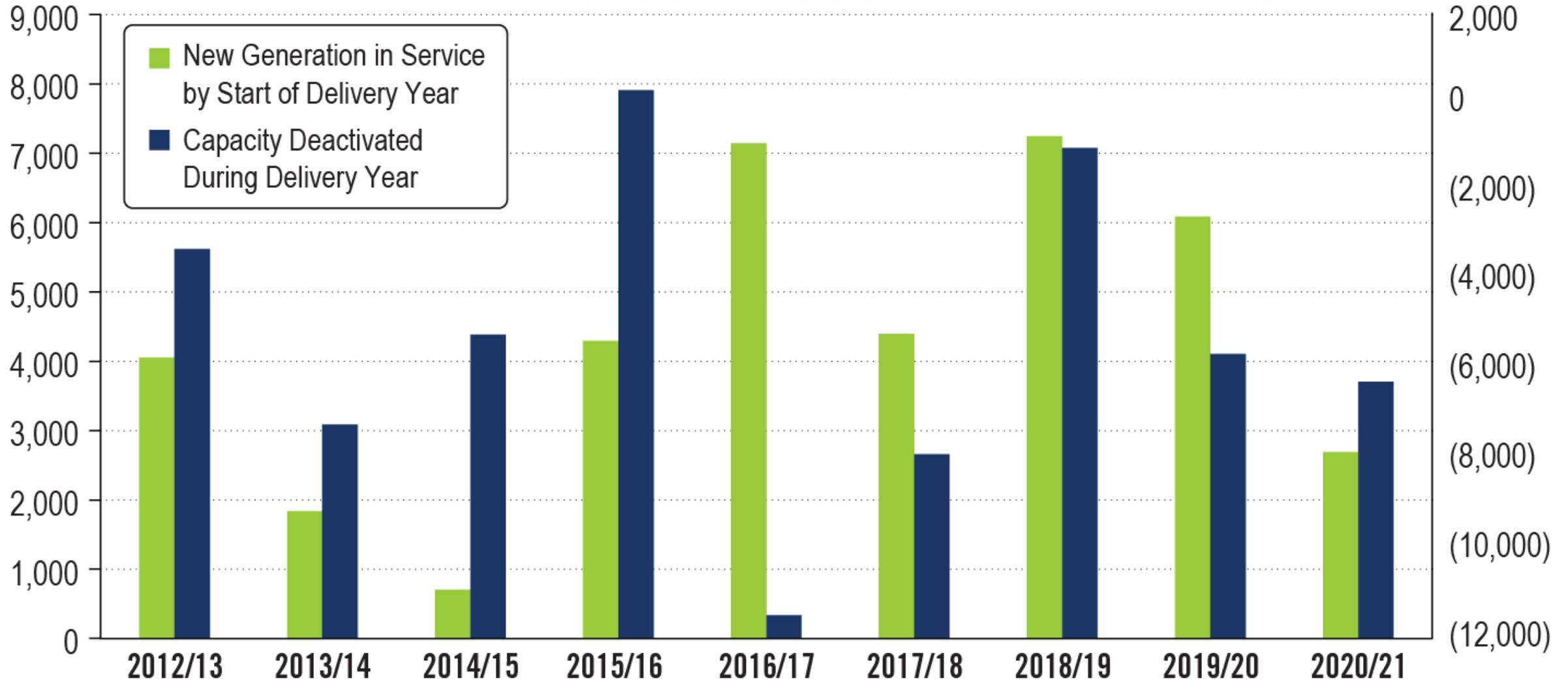
PJM Letter to Stakeholders (March 22, 2005)

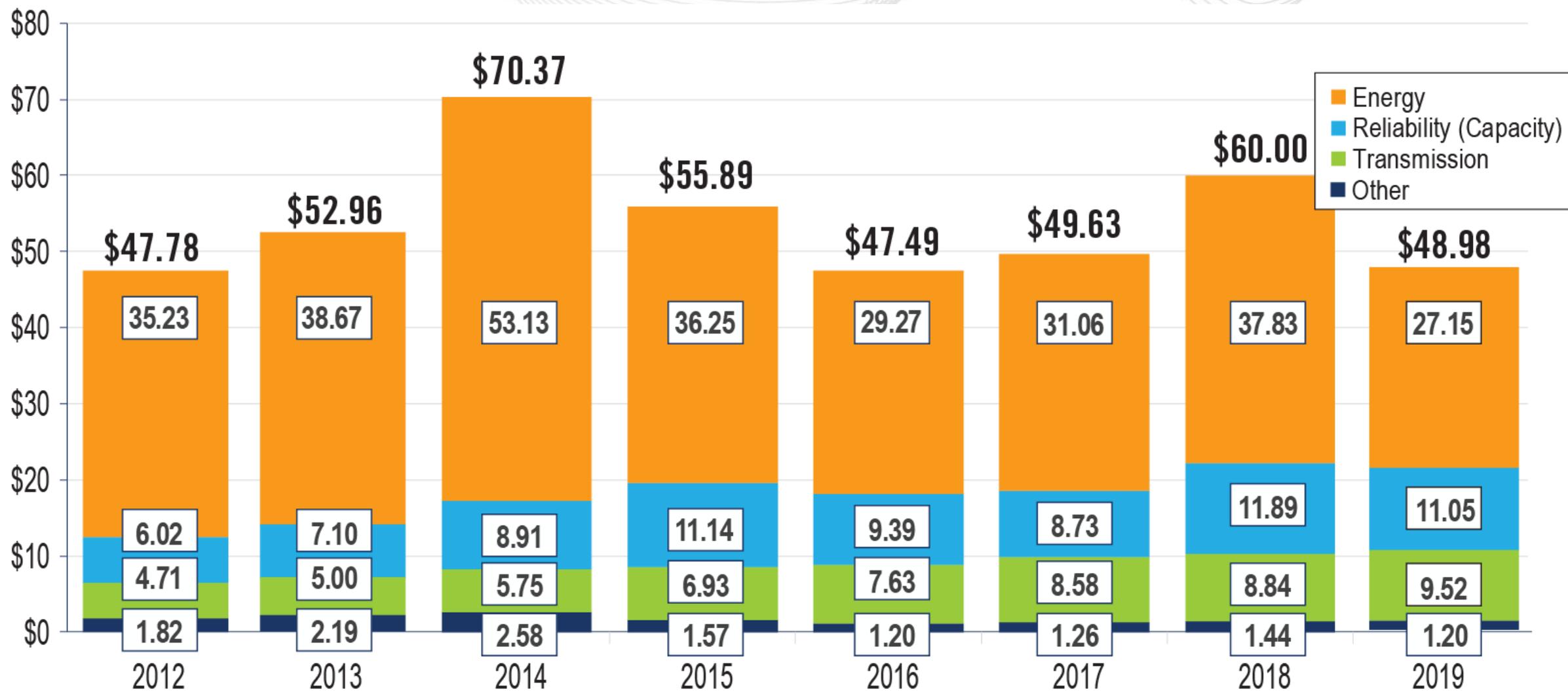
- Over 2,200 MW of announced retirements in transmission constrained portions of eastern PJM
- \$430 million in transmission upgrades projected to be needed by 2008 to replace retirements
- Potential delays in siting (foreshadowing the Susquehanna-Roseland line delays)
- Only 4 MW of new generation in the queue in constrained areas to offset the announced retirements

- **Three critical components were identified to meet this core objective:**
  - Three-year forward commitment to provide enhanced build/retire signal
  - Downward-sloping demand curve to avoid “boom/bust cycle” and recognize the value and lower total cost to customers of capacity above the minimum requirement
  - Locational requirements – recognition of transmission constraints affecting the value of and ability to call on capacity
- **Market power mitigation also an important part of the original design:**
  - Must offer requirement – to prevent physical withholding
  - Market seller offer cap – to prevent economic withholding
  - Minimum Offer Price Rule (MOPR) – to prevent buyer-side market power (initially limited to instances of intent to suppress price to benefit load)

**Core RPM  
Objective**

To enable PJM to obtain sufficient resources to reliably meet the needs of electric consumers within the PJM region over the long term



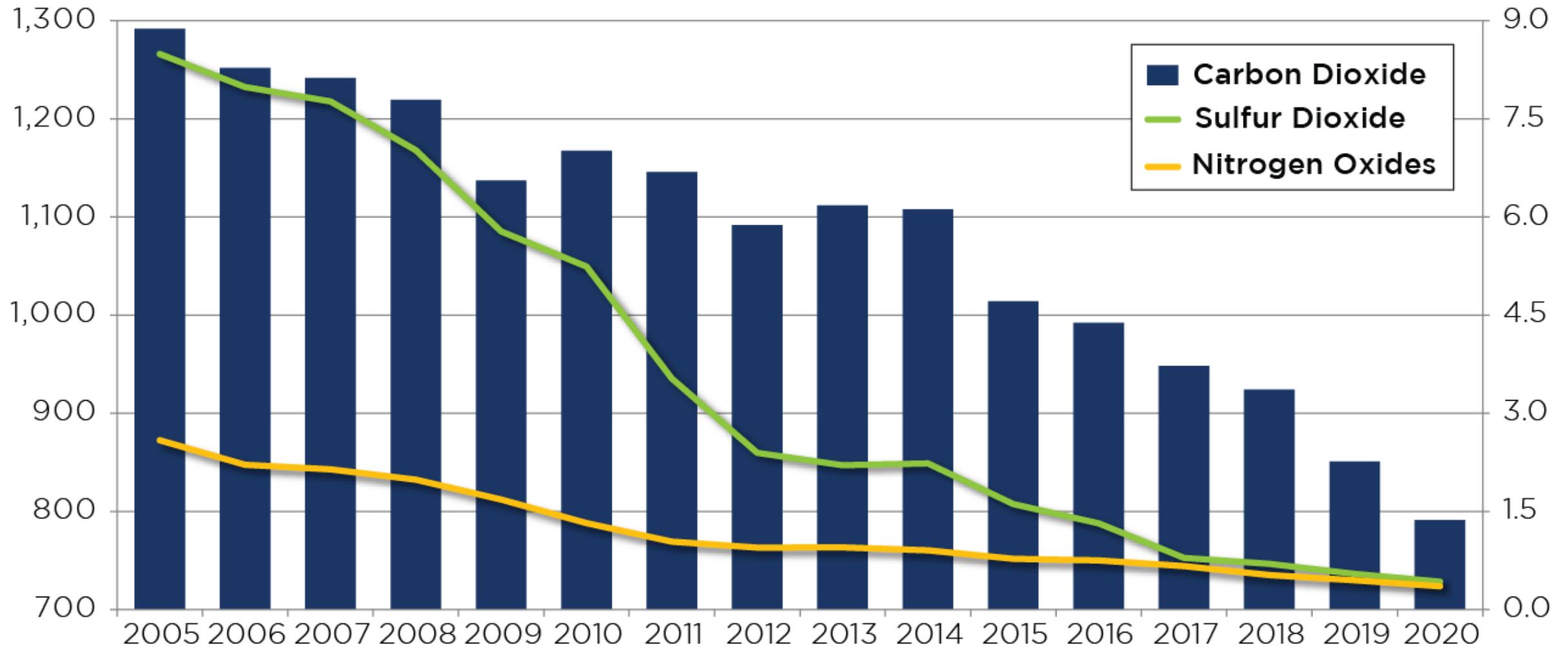




# PJM System Average Emission Rates

CO<sub>2</sub> lbs/MWh

SO<sub>2</sub> and NO<sub>x</sub> lbs/MWh



- Many areas have evolved over time with the core objective remaining the same
  - Demand curve has changed over time – the shape, the height, the CONE
  - Expansion to demand response & energy efficiency
  - Modification of incremental auctions
  - Load forecasting improvements
  - Performance incentives
  - Transmission topology improvements
- The MOPR has also evolved over time

- Initial aim of MOPR (as described by FERC):  
***“...addresses the concern that net buyers might have an incentive to depress market clearing prices by offering some self-supply at less than a competitive level.”***  
*(PJM Interconnection, L.L.C., 117 FERC ¶ 61,331 at P 103 (2006))*
- Over the years, MOPR was challenged given changing circumstances
- 2010–2011 time frame, certain state actions to provide out-of-market payments to certain resources which would participate in the capacity market
- Courts have embraced MOPR as a tool, but with limits and in recognition of states’ ability to make resource choices
  - 2014 Third Circuit Order
  - 2016 Supreme Court decision in the Hughes case

“Our holding is limited: We reject Maryland’s program only because it disregards an interstate wholesale rate required by FERC. We therefore need not and do not address the permissibility of various other measures States might employ to encourage development of new or clean generation, including tax incentives, land grants, direct subsidies, construction of state-owned generation facilities, or re-regulation of the energy sector.

Nothing in this opinion should be read to foreclose Maryland and other States from encouraging production of new or clean generation through measures ‘untethered’ to a generator’s wholesale market participation.”

*(Hughes v. Talen Energy Mktg., LLC, 136 S. Ct. 1288, 1301, 194 L. Ed. 2d 414 (2016) (Ginsburg, J.))*

- Original concept of MOPR focused on “buyer’s intent and incentive to exercise market power.”
- Post-Hughes case: Because the Supreme Court “sliced” as between state programs “tethered” to wholesale markets and those not, the focus turns away from intent and toward the specific design of a particular subsidy program.
- MOPR expanded to attempt to address any cause of price suppression as opposed to intent to exercise market power.

# Where Do We Go From Here?

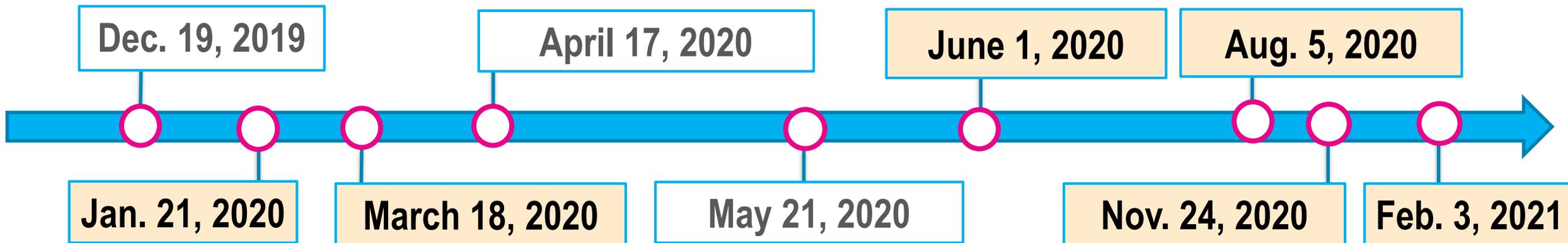
## Framing the Issue

We've worked hard with stakeholders to get RPM auctions back on the calendar.

## Stakeholder listening sessions leading to PJM's March 18 compliance filing:



## Timeline of FERC Orders and compliance filings:

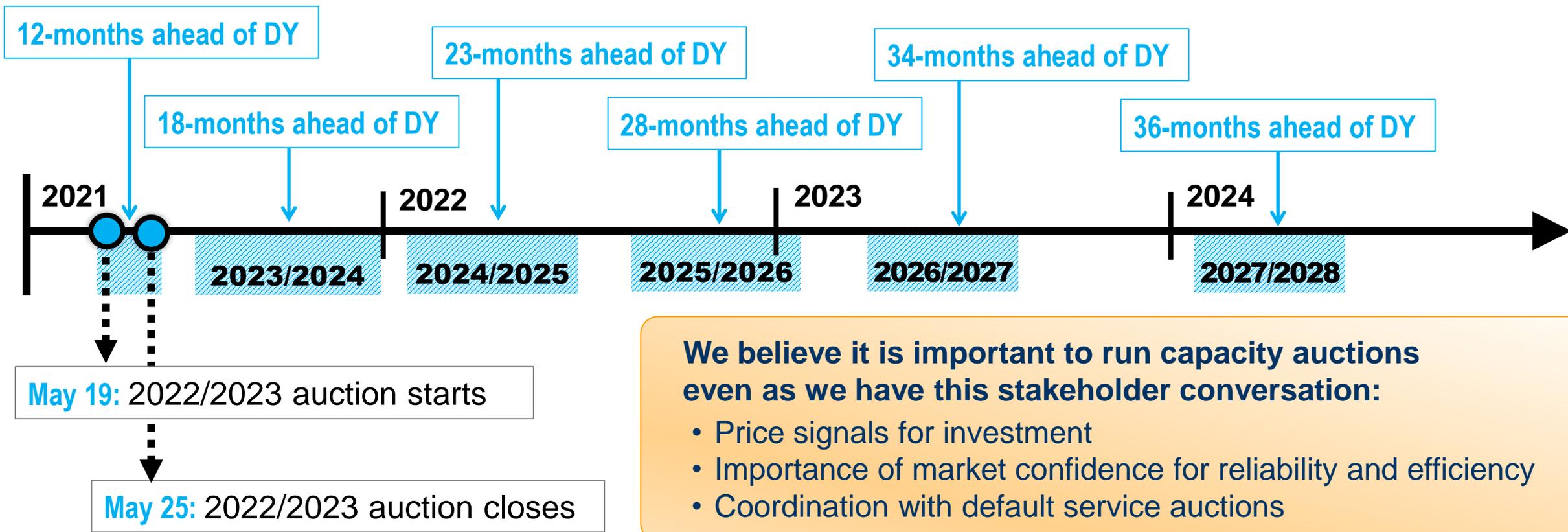


**Impact of MOPR may be less in the near term than the long term:**

- Existing RPS resources and self-supply is exempt
- Flexibility in the unit-specific process for new renewables
- Default service auction issues have been addressed
- Near-term nature of upcoming auctions

## PJM has two capacity auctions scheduled this year

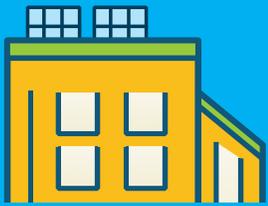
**Subsequent auctions: Accelerated to every ~six months through 2024**



**We believe it is important to run capacity auctions even as we have this stakeholder conversation:**

- Price signals for investment
- Importance of market confidence for reliability and efficiency
- Coordination with default service auctions

. . . several trends are driving the energy transition.



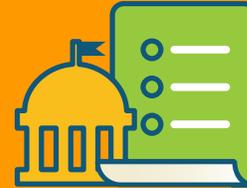
## Consumer Preferences

- Cleaner
- More control
- Technology choices (EVs)



## Technology

- DERs
- Renewables
- Batteries
- Load flexibility



## State Policy

- RECs
- ZECs
- Offshore wind
- State differences



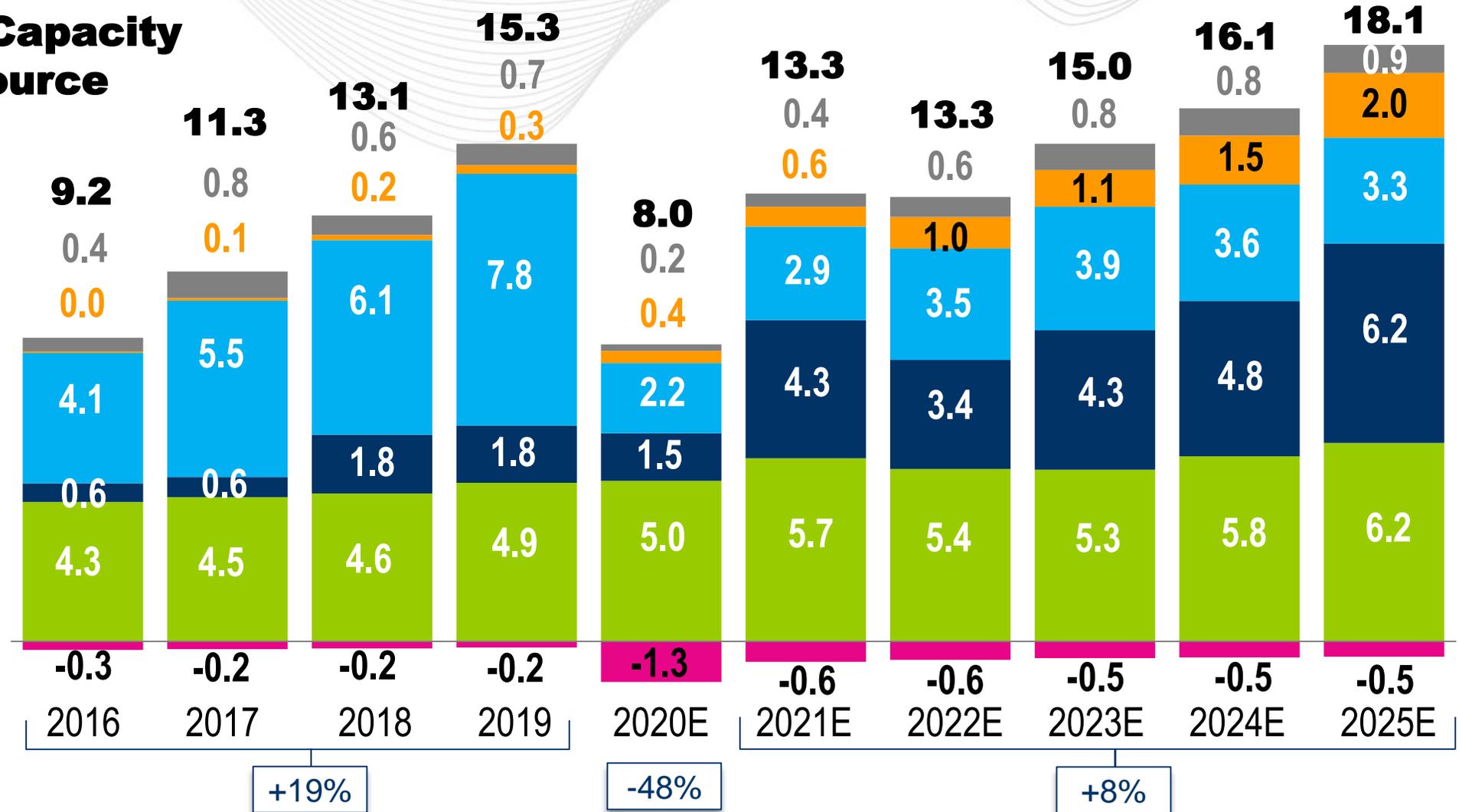
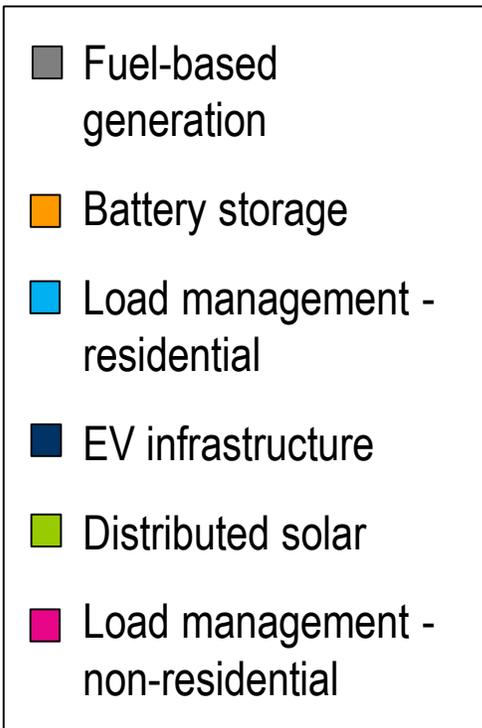
## Federal Policy Shifts

- New Administration
- Climate priorities
- Decarbonization goals



# Consumer and Technology Trends Are Expected to Continue

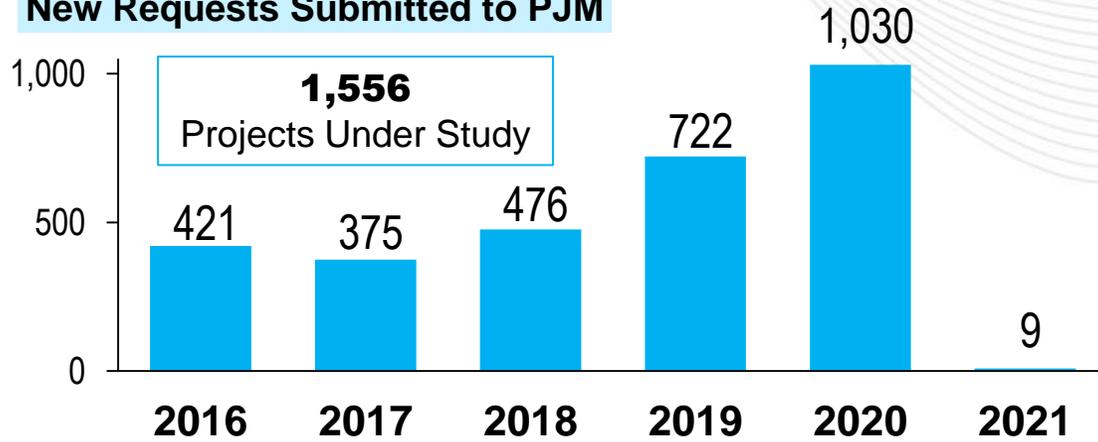
## U.S. DER Annual Capacity Additions by Resource Type (GW)



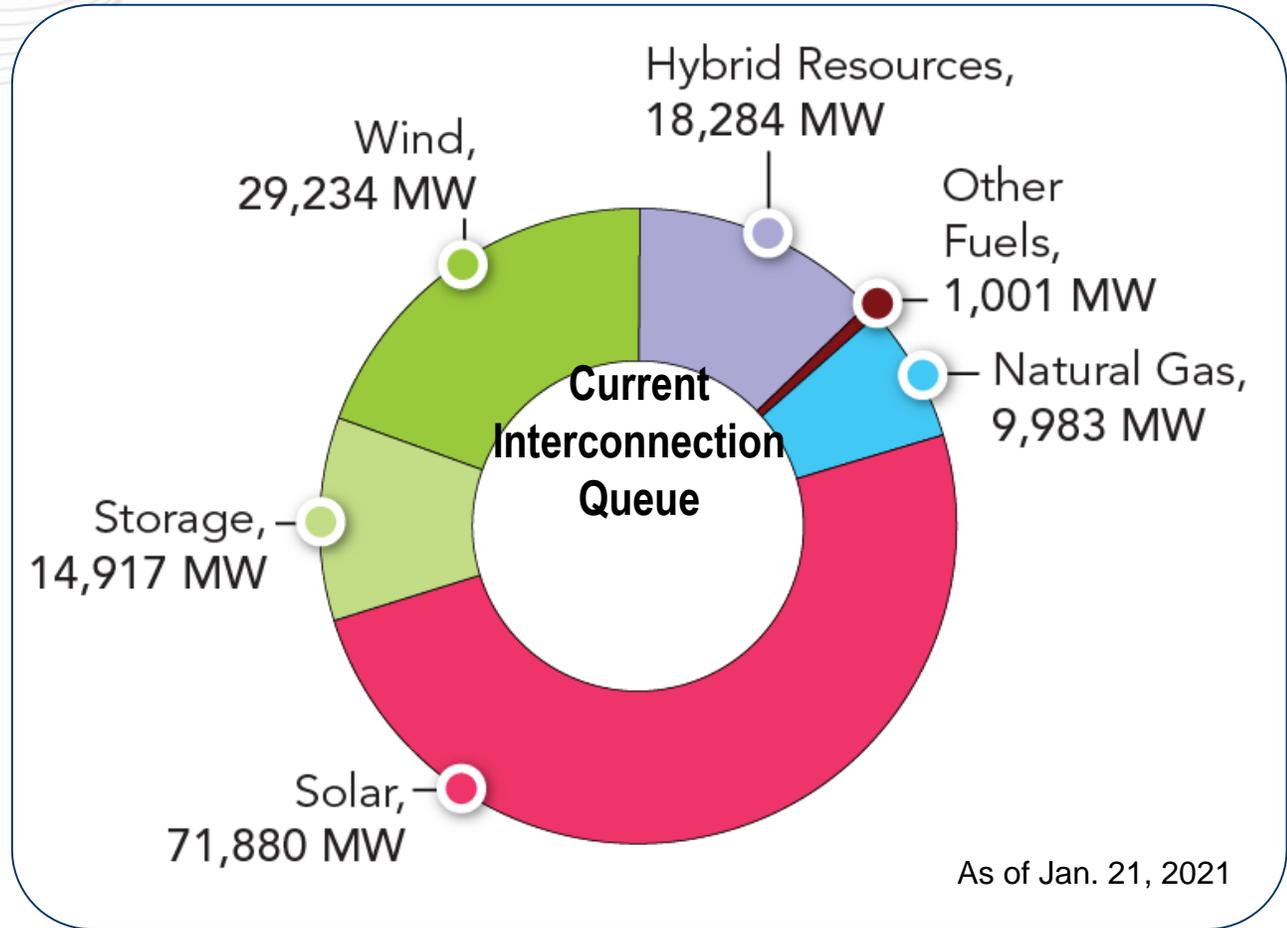
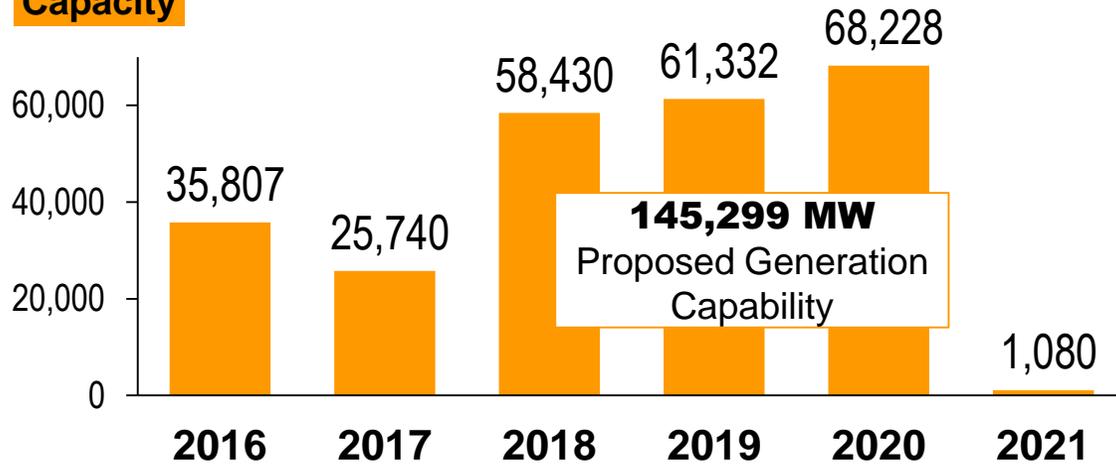
Note: Non-residential load management forecast to decline due to shrinking brick and mortar retail sector, energy efficiency improvements, and falling business investment in commercial and industrial facilities. Residential load management largely comprised of smart thermostats, with a growing share of grid-interactive water heaters. Source: Wood Mackenzie US DER Outlook, June 2020

# We Are Seeing These Trends Manifest Themselves in Our Interconnection Queue

**New Requests Submitted to PJM**



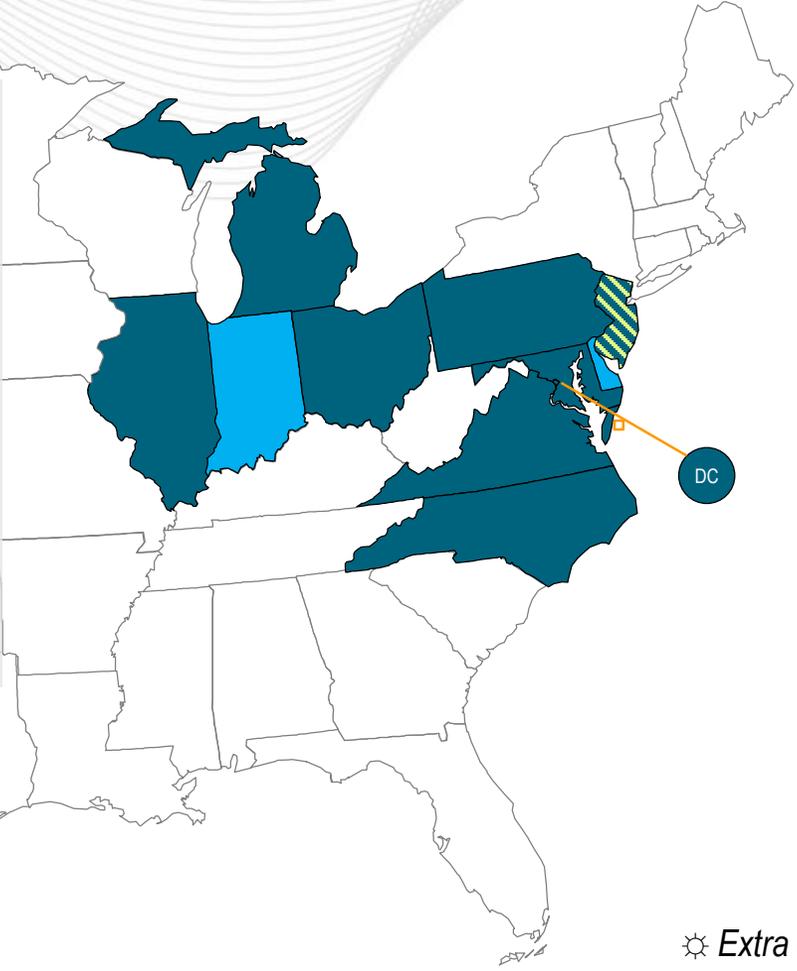
**Capacity**



# PJM States and D.C. Have Significant Clean Energy Goals, and Each Has Its Own Approach

**U.S.**  
**30 States + D.C.** have a Renewable Portfolio Standard; **5 states** have a Clean Energy Standard  
 8 states have renewable portfolio goals, 5 states have clean energy goals

**PJM**  
 ▪ **8 PJM states + DC** have a Renewable Portfolio Standard  
 ▪ **2 PJM states** have a Renewable Portfolio Goal  
 ▪ **1 PJM state** has a Clean Energy Goal



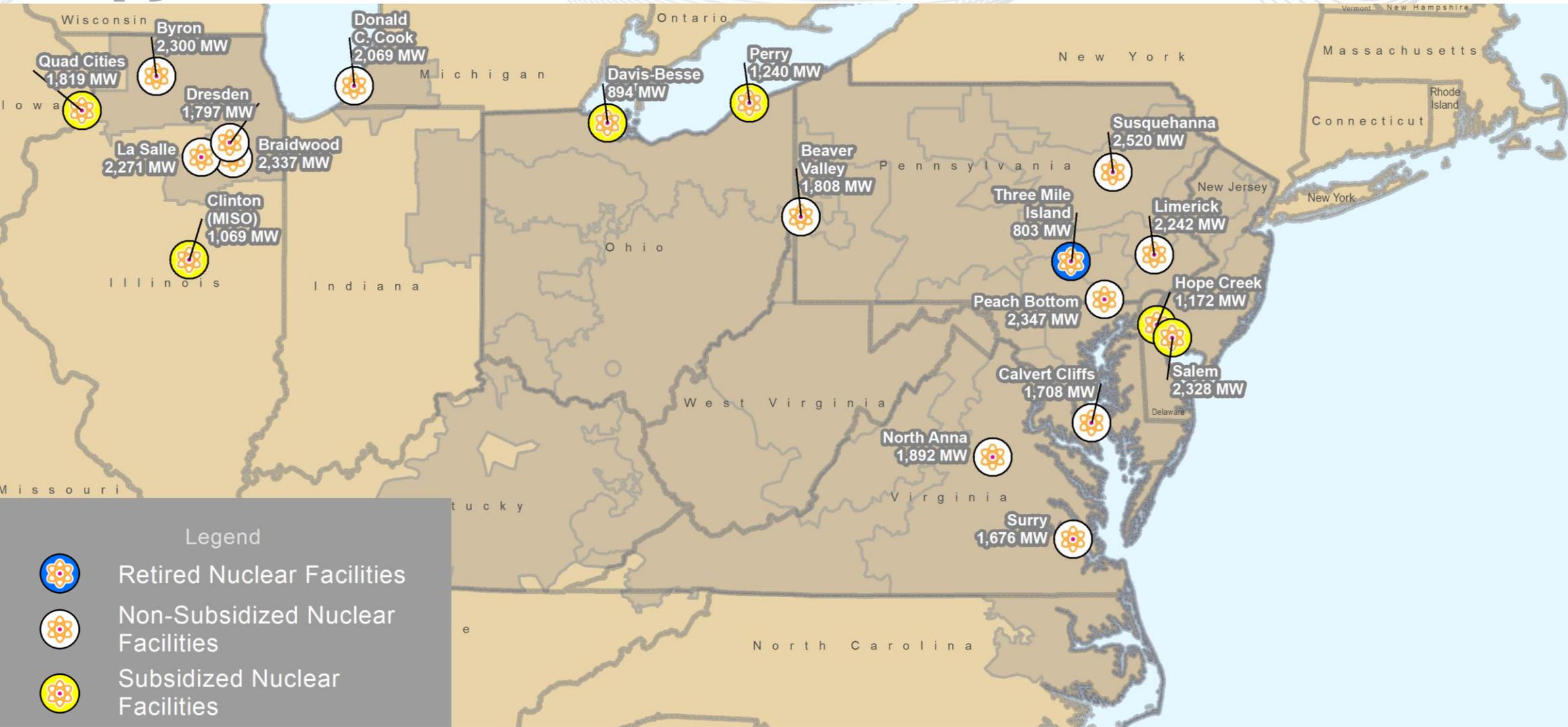
<b>DC</b>	100% x 2032
<b>DE</b>	25% x 2026 ☀
<b>IL</b>	25% x 2026
<b>IN</b>	10% x 2025 ▲
<b>MD</b>	50% x 2030
<b>MI</b>	15% x 2021 ☀▲
<b>NC</b>	12.5% x 2021 (IOUs)
<b>NJ</b>	50% x 2030; (100% x 2050)
<b>OH</b>	8.5% x 2026
<b>PA</b>	18% x 2021 ▲
<b>VA</b>	100% x 2045/2050

**Renewable Portfolio**  
 ● Standard  
 ● Goal

**Clean Energy**  
 ● Standard  
 ● Goal

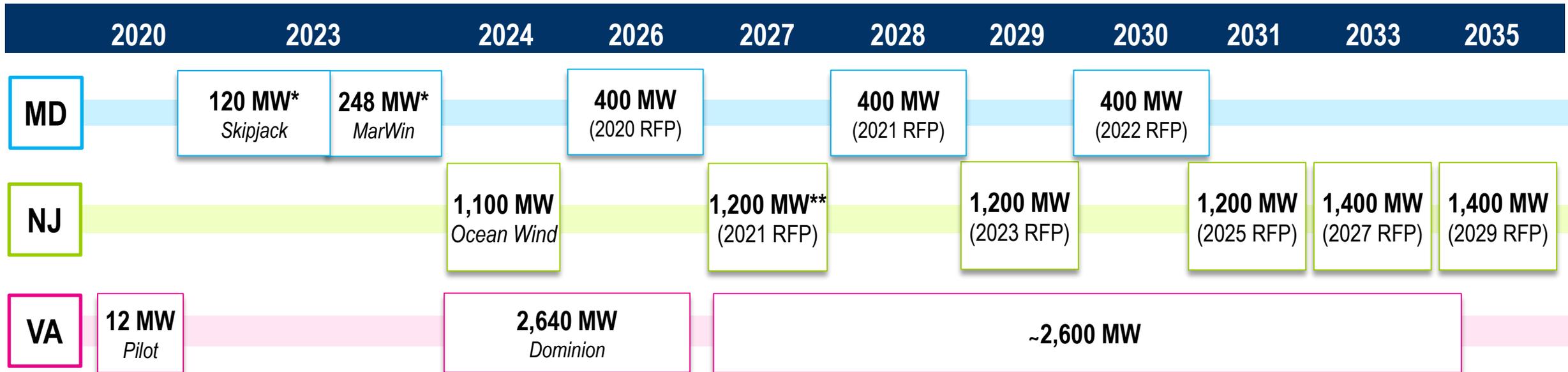
☀ Extra credit for solar or customer-sited renewables  
 ▲ Includes non-renewable alternative resources

www.dsireusa.org | September 2020



# States' Offshore Wind Plans Are Approaching Fast

	Maryland	New Jersey	Virginia
	Target: <b>1,568 MW by 2030</b>	Target: <b>7,500 MW by 2035</b>	Target: <b>5,200 MW by 2034</b>
<b>POLICIES</b>	<ul style="list-style-type: none"> <li>Maryland PSC Order No. 88192 (2017)</li> <li>Clean Energy Jobs Act of 2019</li> </ul>	<ul style="list-style-type: none"> <li>Clean Energy Act of 2018</li> <li>Executive Order No. 92 (2019)</li> </ul>	<ul style="list-style-type: none"> <li>Virginia SCC Order (2018)</li> <li>Virginia Clean Economy Act of 2020</li> </ul>



\*Subject to delay; \*\*NJ solicitation #2 may result in the procurement of up to 2,400 MW.

- President Biden's priorities statement on the White House website:

*“President Biden will take swift action to tackle the climate emergency. The Biden Administration will ensure we meet the demands of science, while empowering American workers and businesses to lead a clean energy revolution.”*

- President Biden's executive order to rejoin the Paris Climate Accord
- Biden Administration's goals to decarbonize the power sector by 2035 and the full economy by 2050
- Court of Appeals decision regarding EPA authority

**How the decarbonization goals** will manifest in federal policy is not yet clear.

# How Should PJM's Capacity Market Evolve From Here?

# It's Important to Start by Stating the Problem We're Trying to Solve

## MOPR

The capacity market needs to accommodate state resource decisions without causing the risk of double procurement for load.

## Competitive Auctions for Policy Resources

Given several state programs driving toward decarbonization and customer preferences, can PJM run auctions for state-mandated and consumer-preferred clean capacity?

## Capacity Procurement Levels

PJM has high reserve margins. Is there a way to achieve desired reliability more efficiently over time?

## Additional Reliability Attribute Products

With anticipated increase in penetration of intermittent resources, are there additional reliability attributes that need to be procured?

Are we missing any?

- Does FERC intend to take any actions related to MOPR? When? (Note commissioners' prior statements on the MOPR)
- How will the judicial appeals of the FERC MOPR orders be decided?
- A meaningful amount of offshore wind looks like it will participate starting in the 2024/2025 auction. What impact does this have on timing of a solution to the “double payment” problem?
- Which state-subsidized resources will and won't clear in the next few auctions?
- Will there be any additional federal actions?

**While these factors are impossible to predict with precision, PJM believes there may be a relatively narrow window for stakeholders to proactively take up some or all of these questions.**

# Drivers Suggest Prioritizing MOPR and a Narrow Window for Action

## Resources Subject to MOPR Now and in the Near Future

**MOPR May Not Accommodate State Policy Goals in the Longer Term**

**State Clean Energy Goals Are Increasing**



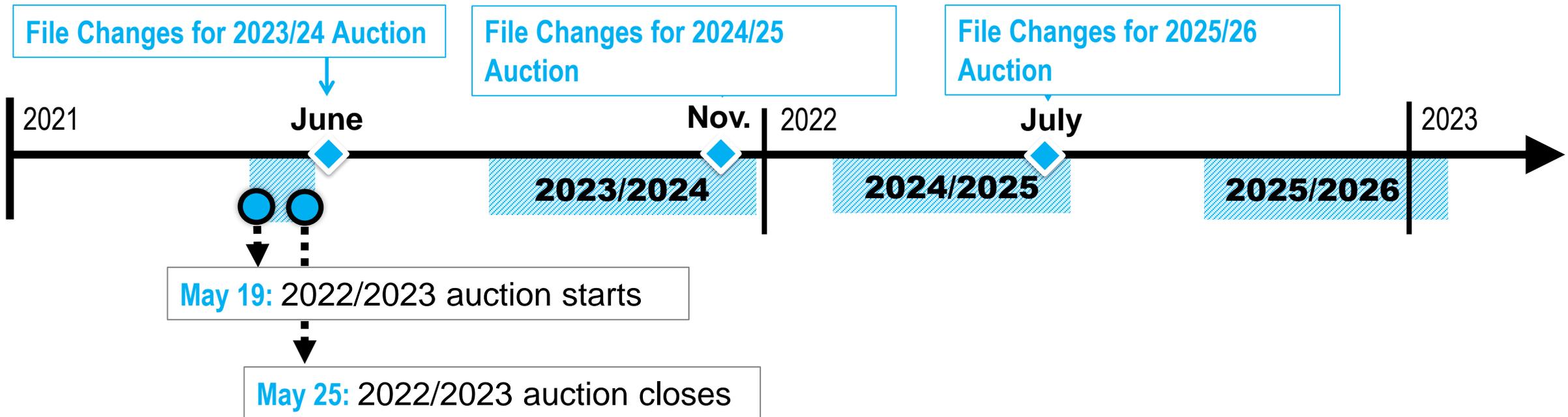
**Federal Policy Has Shifted Given the New Administration**

**Potential Costs of Double Procurement**

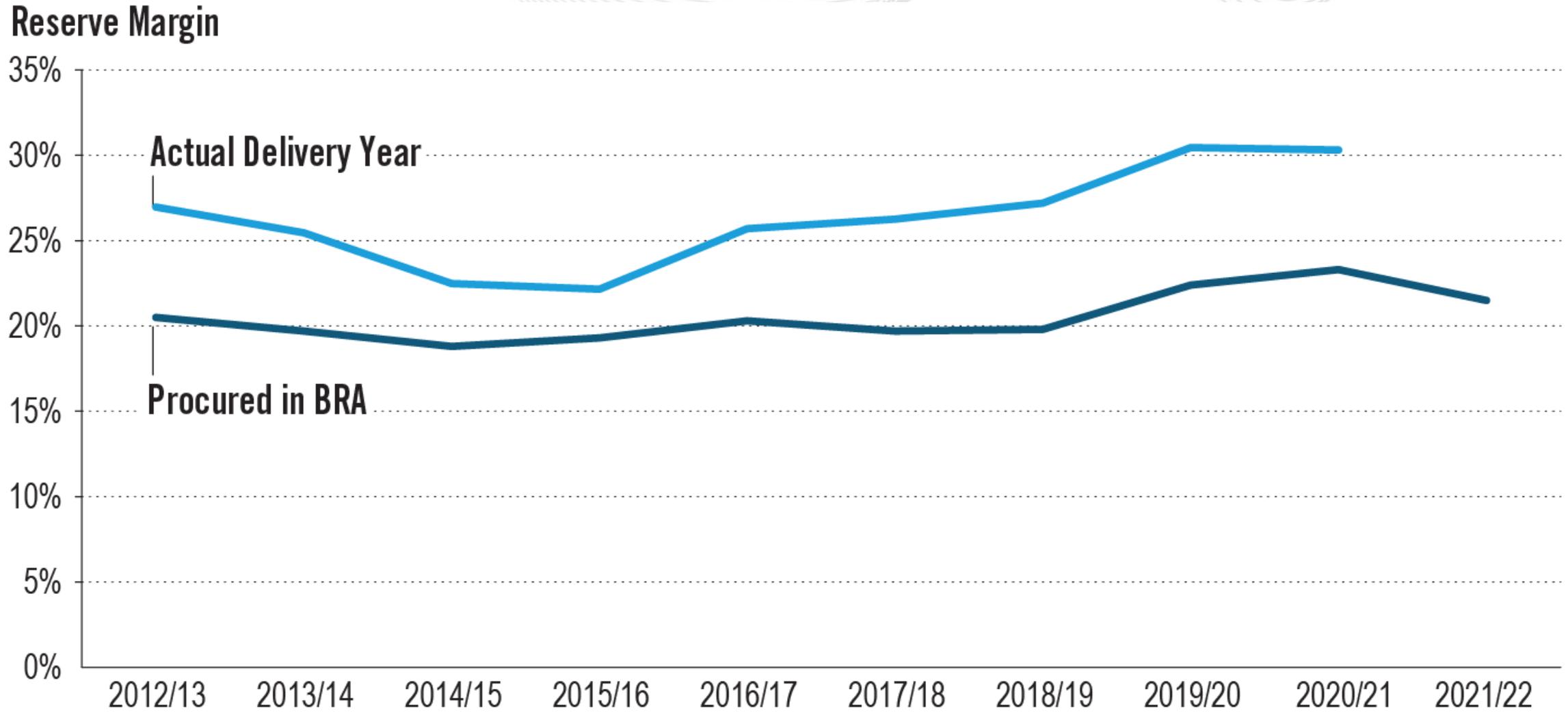
# Timeline for Changes Is Further Constrained Given the Auction Schedule

**Filing time frames below are** indications of when filings would need to be made IF changes were desired for the upcoming auction.

Filing time frames are approximately 60 days prior to due date for unit-specific MOPR requests.



# Procurement Levels: Recent Cleared and Actual Reserve Margins



## **This is a complex issue with multiple aspects.**

Parts of the issue represent “good” over-procurement.

- The downward-sloping demand curve economically procures resources over and above the reserve requirement when surplus exists.
- This results in enhanced reliability through additional, committed capacity and lower total cost to load via lower capacity prices.
- Capacity also remains in operation that has not cleared the capacity market, representing increased reliability at NO cost to load.

## **There are several other factors that also contribute to over-procurement.**

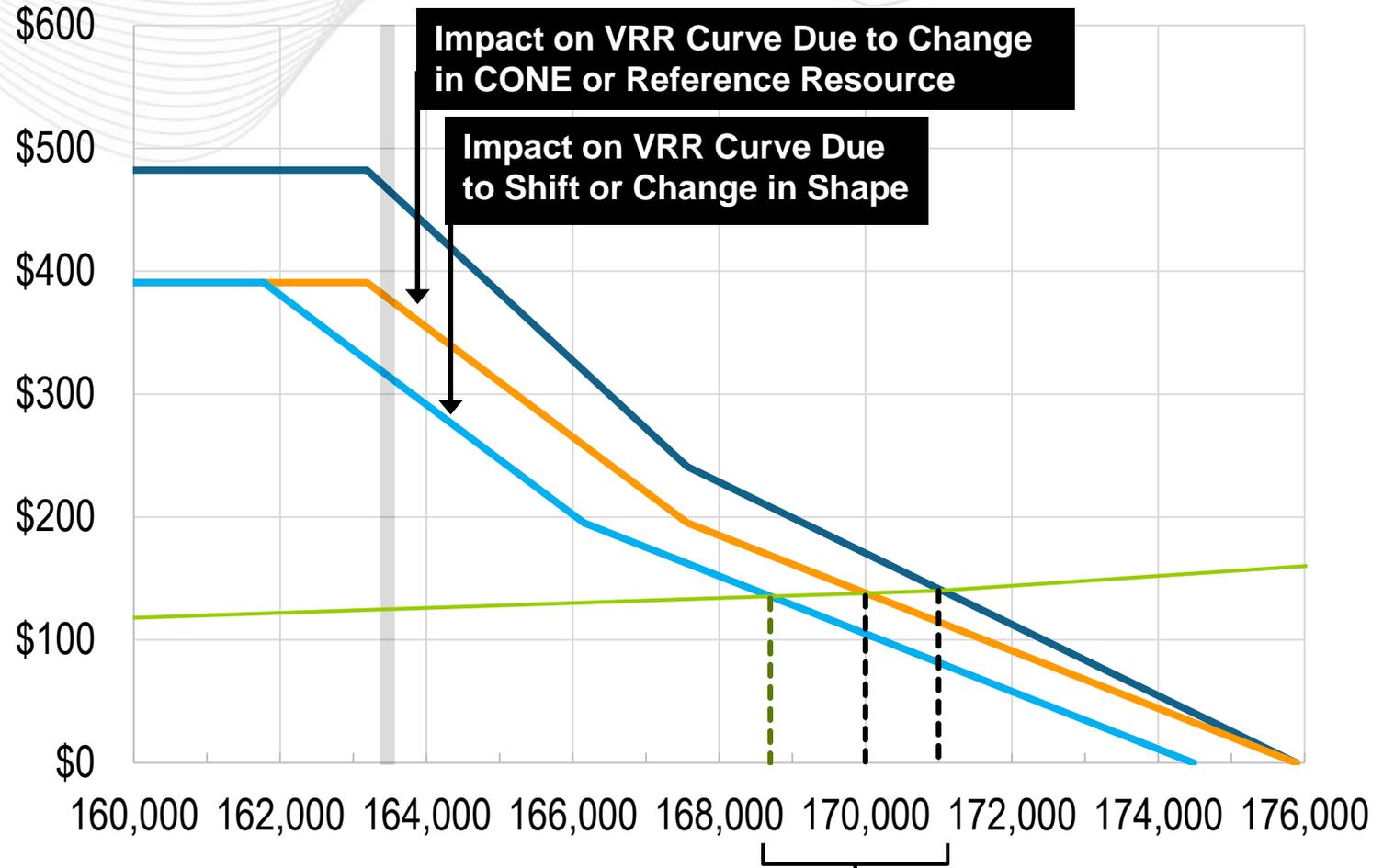
### PJM Load Forecast

- PJM strives to make the load forecast as accurate as possible.
- PJM has engaged the stakeholder community over several years to improve its load forecasting processes.
- PJM will continue to do so through the Planning Committee and the Load Analysis Subcommittee.

## Other factors require analysis and consideration:

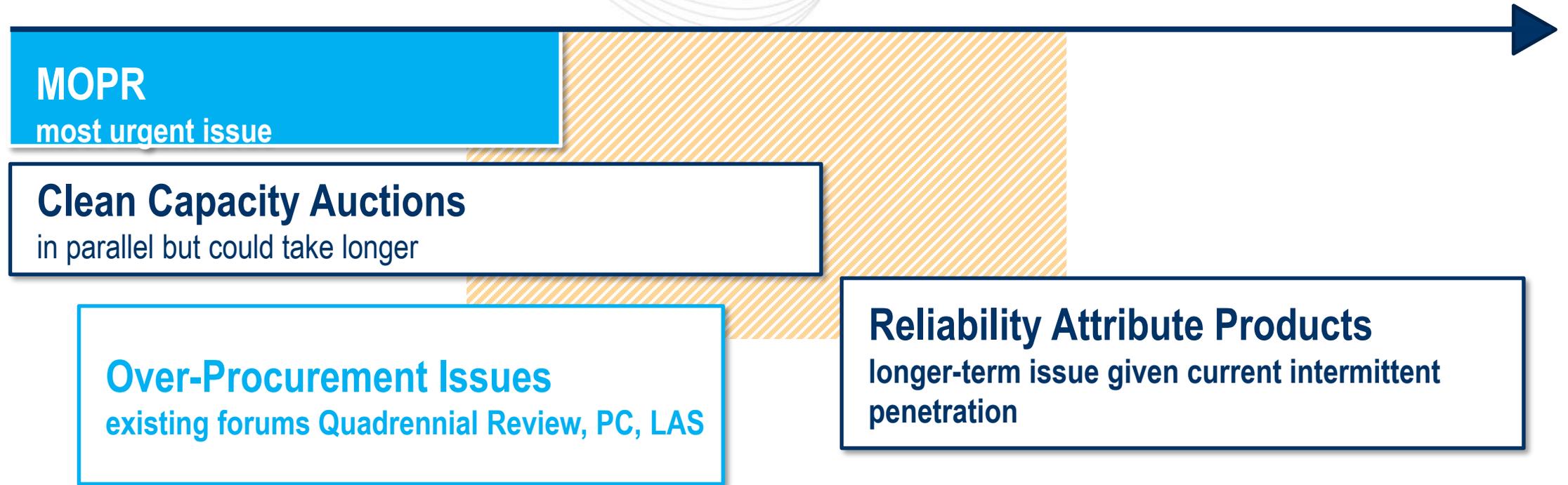
- Choice of reference resource
- Cost of New Entry (CONE) calculation
- E&AS Offset
- Shape and position of VRR curve

These factors have an existing forum through the Quadrennial Review



Impact on procurement levels resulting from changes in these components

# Given a Potentially Constrained Timeline, PJM Recommends Sequencing the Issues, Starting With MOPR



What are stakeholders' thoughts on this sequencing approach?  
What should be sequenced vs. overlap or be addressed simultaneously?

- It would be helpful to have a set of principles by which potential solutions could be evaluated.
- OPSI has submitted a set of principles.
- PJM has suggested a few more.
- We are interested in stakeholder feedback on these.

State procurements or competitive solicitations, policy choices, emissions levels, or clean energy requirements must be respected and accommodated, rather than over-ridden or made infeasible by PJM market rules.

1

States should have the option of specifying the clean energy, emission levels, or other content of their own resource mix, in whole or in part, which the PJM market would then account for or procure on a competitive, least-cost basis, consistent with reliability.

2

Because states retain primary authority for resource adequacy under the Federal Power Act, any re-imagined resource adequacy solution must continue to allow states the option of meeting resource adequacy through a mechanism independently, similar to the current Fixed Resource Requirement.

3

Effective and appropriate market power mitigation is imperative for a properly functioning market design, and for PJM-administered markets generally.

4

**Other principles  
PJM believes could  
be important:**

- Limiting scope of changes to what's required to solve the problem may expedite resolution.
- Any solution must ensure states' choices around resource mix are honored.
- Competition should be leveraged to benefit consumers wherever possible.
- Any solution should support long-term grid reliability in an efficient manner

What principles would stakeholders add or subtract?



- PJM is expressing its views as a starting point for the conversation.
- We want to hear from stakeholders and have structured the upcoming workshops to provide that opportunity.

## **Session 2**

**March 4**

Stakeholder feedback  
on framing the issue

## **Session 3**

**March 12**

Stakeholder feedback on  
potential market design solutions

## **Session 4**

**March 26**

PJM response and  
discussion of next steps

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**Capacity Workshop Session 1**



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