PJM Capacity Workshop #2

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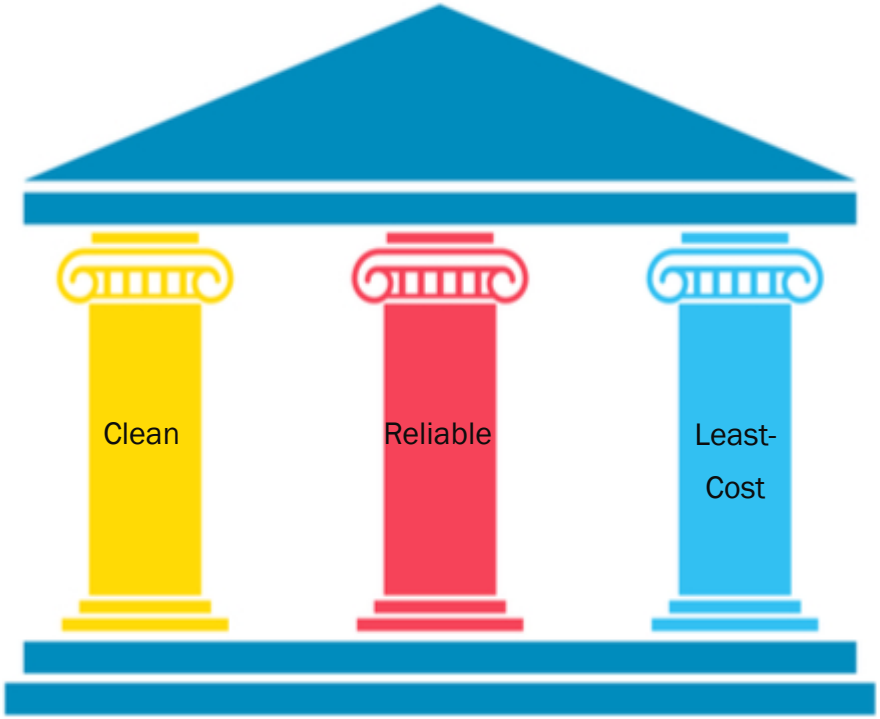
Three Pillars to a Sustainable Capacity Design



Actions Required

- Replace existing MOPR
- PJM markets should internalize carbon externalities
- Refine RPM to address changing system needs

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Principles for Capacity Market Reform

The MOPR should not target state choices and decarbonization goals

- The MOPR should be repealed immediately and replaced with rules that accommodate states' authority to set their resource mix and prevent deliberate exercise of buyer side market power
- PJM rules should not target state preferences for retaining and expanding the environmental benefits of clean generation - including nuclear power - that are essential to meet aggressive carbon reduction goals

PJM markets should internalize carbon externalities

- PJM markets – especially the energy market – should reflect a meaningful carbon price, the effectiveness of which is not undermined by carbon leakage
- Carbon pricing is more efficient than modifications to RPM

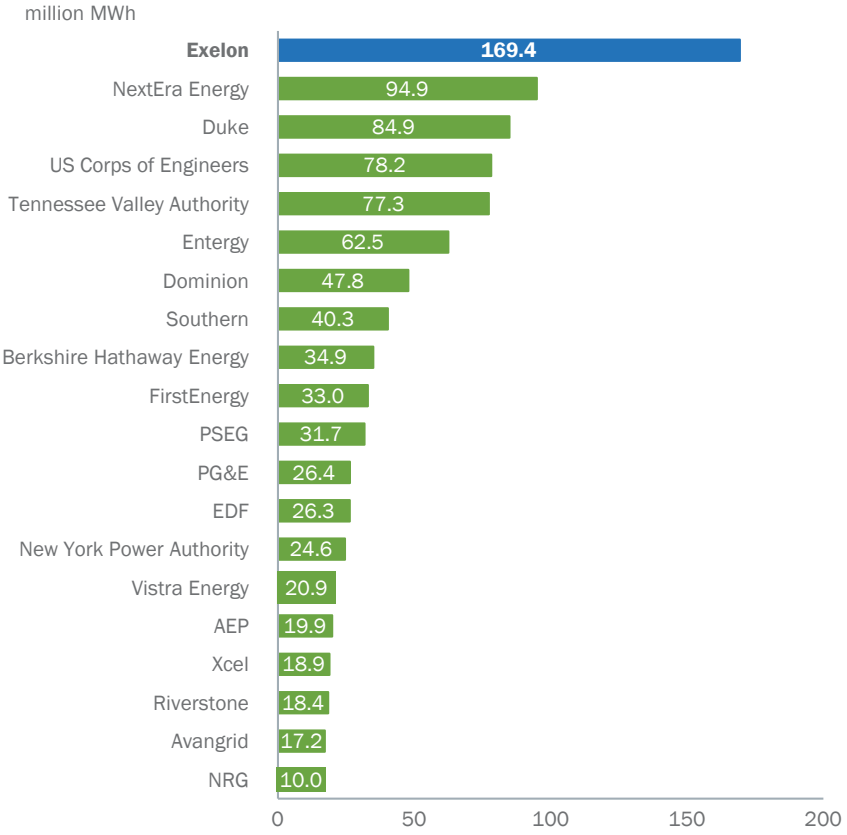
RPM must evolve to address changing system needs

- Market design must address the challenges of operating an evolving clean supply stack
- PJM's capacity market should be modified to reduce unproductive supply, which is impeding effective energy market pricing

Exelon is the Largest Producer of Clean Electricity in the United States

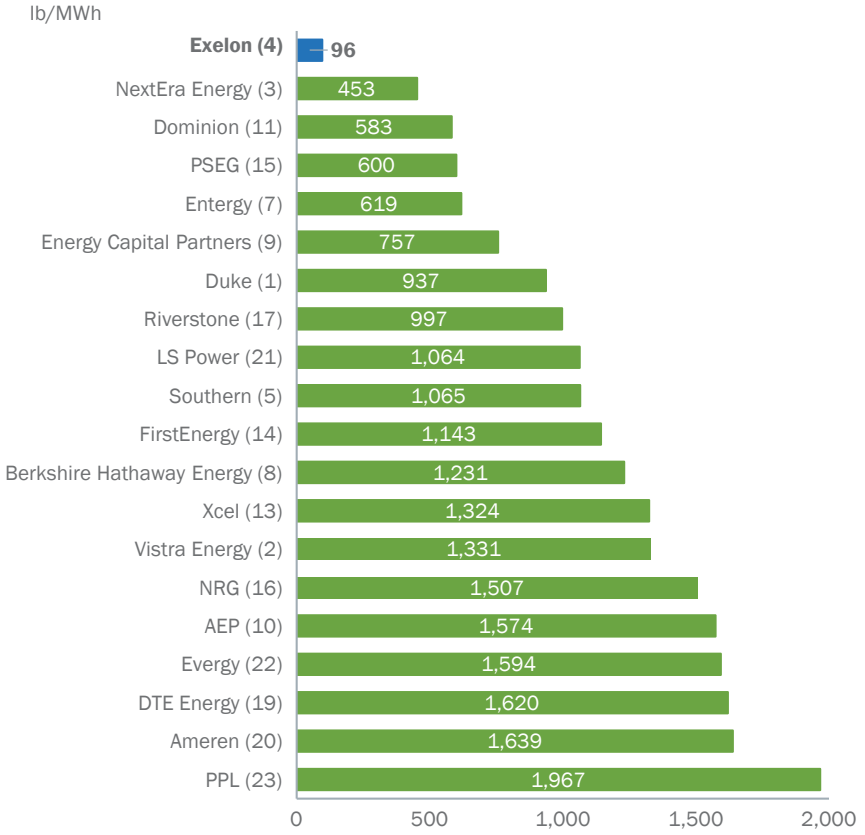
Largest Producers of Zero-Carbon Generation(1)

Largest U.S. generator of zero-carbon electricity (almost 2 times more than next largest producer)



CO_2 Emission Rates of Investor-Owned Power Producers(1,2)

Lowest carbon intensity among major investor-owned generators



Exelon produces nearly 12% or 1 out of every 9 MWhs of clean electricity in the U.S.

Note: Exelon data does not reflect retirement impacts of Byron and Dresden

(1) Reflects 2018 regulated and non-regulated generation. Source: Benchmarking Air Emissions, July 2020; https://www.mjbradley.com/sites/default/files/Presentation of_Results_2020.pdf

(2) Number in parentheses is the company generation ranking in 2018, i.e. Exelon was the fourth largest generator in 2018

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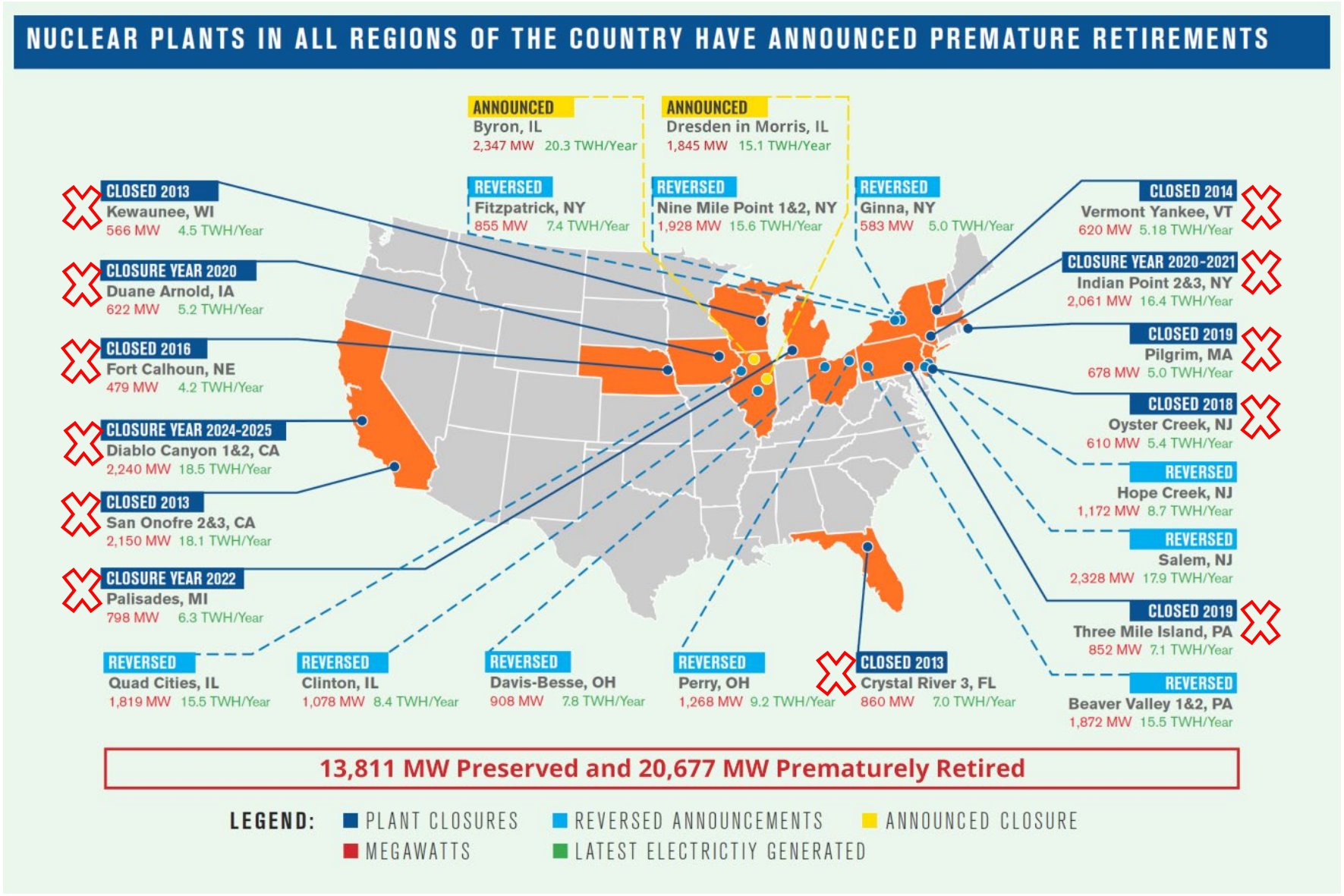
Nuclear Plant Closures Would Hamper State Goals



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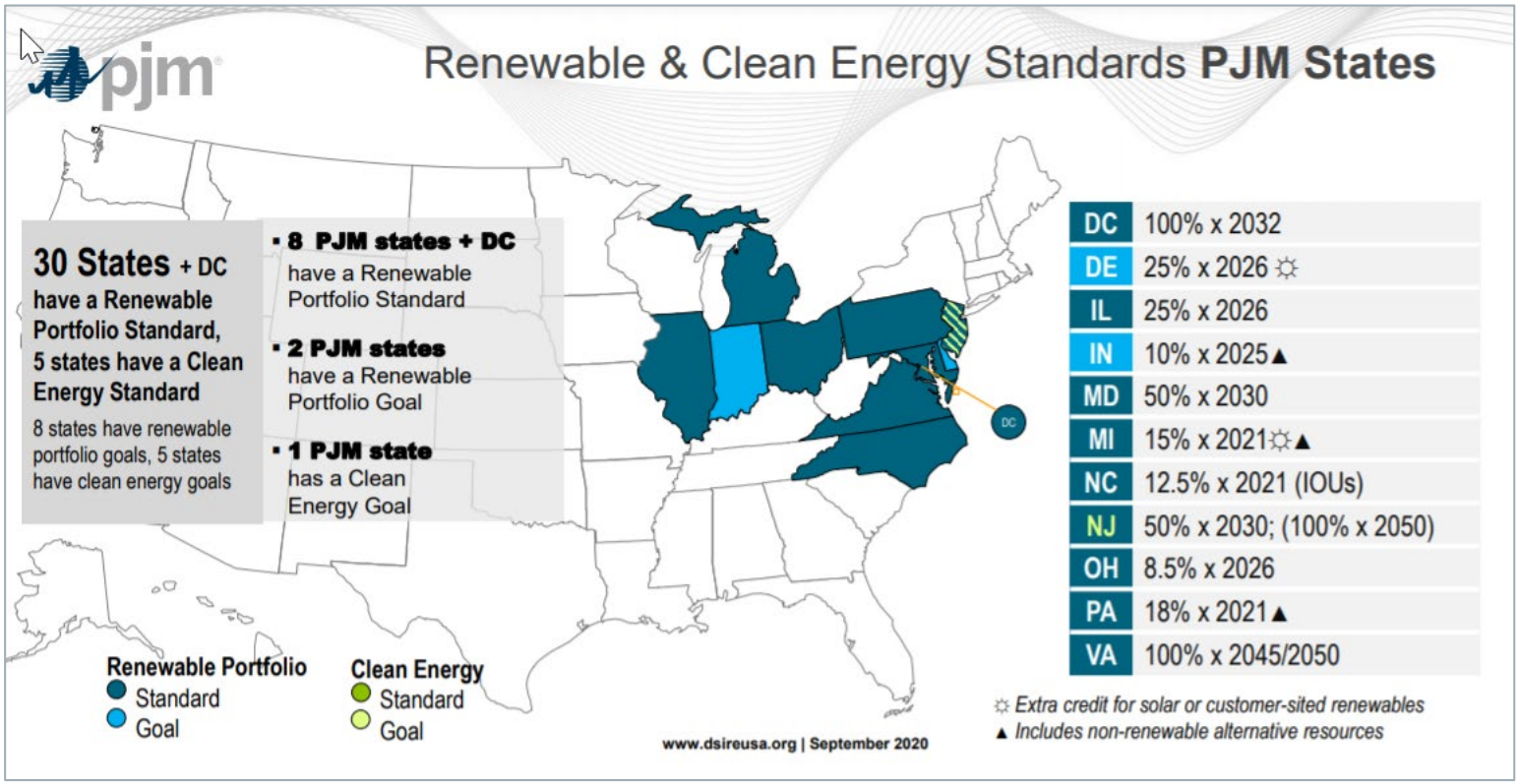
PJM States are Among the Leaders in Addressing Carbon Pollution



With Pennsylvania's entry into RGGI,
55% of PJM load will be in a carbon pricing jurisdiction in 2022

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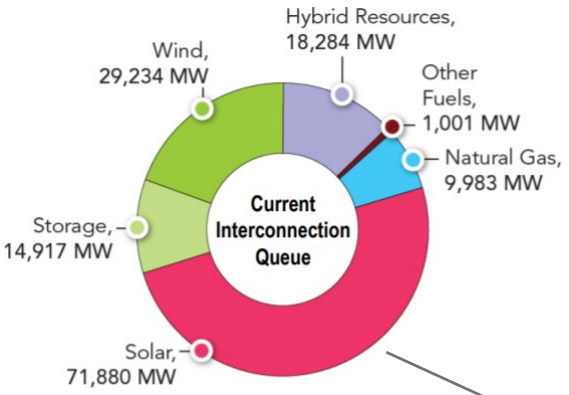
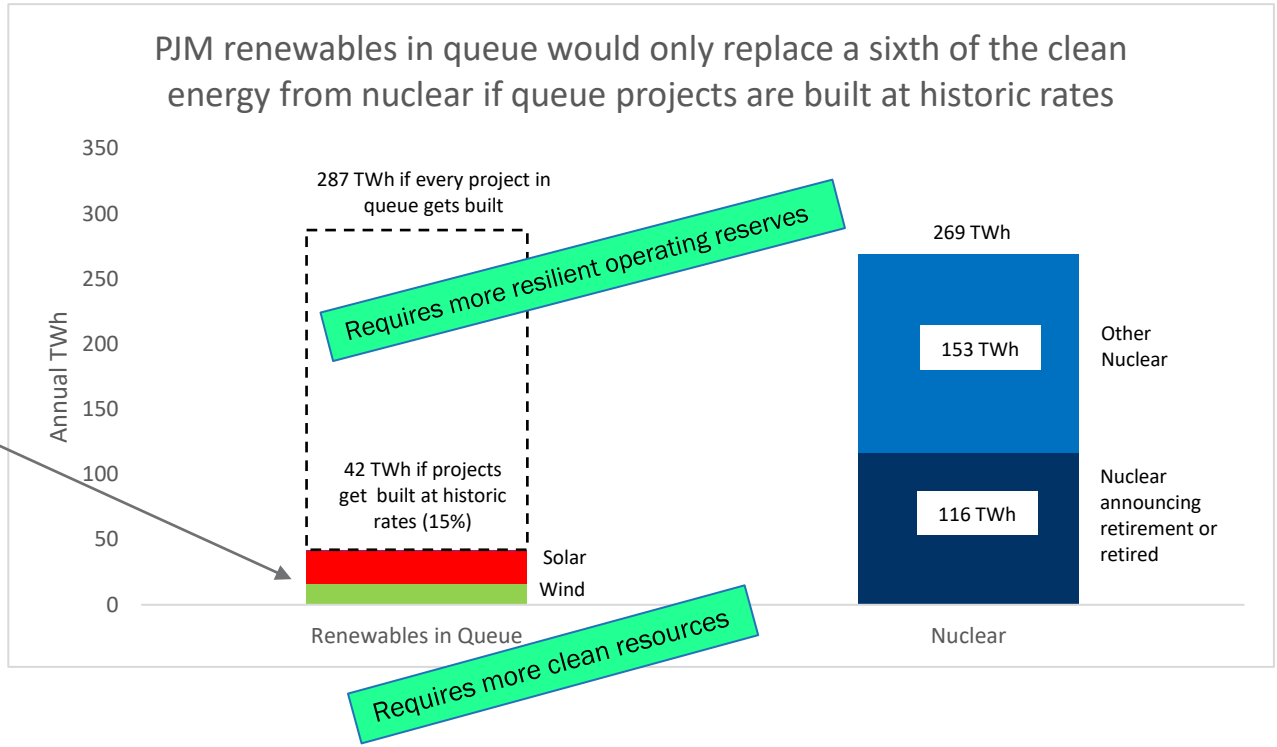
All Clean Technologies Are Needed to Meet State Goals



Source: PJM Interconnection Queue as of 1/21/21



- Nuclear *and* renewables are needed to achieve clean energy targets
- As renewable intermittency increases, operating reserve needs increase
- State preferences for nuclear, which provide both clean and resilient energy, should not be undermined by PJM market design

PJM market design must harmonize with all state clean energy choices to facilitate state policies and enable the transition to a reliable, least-cost, *and* clean supply

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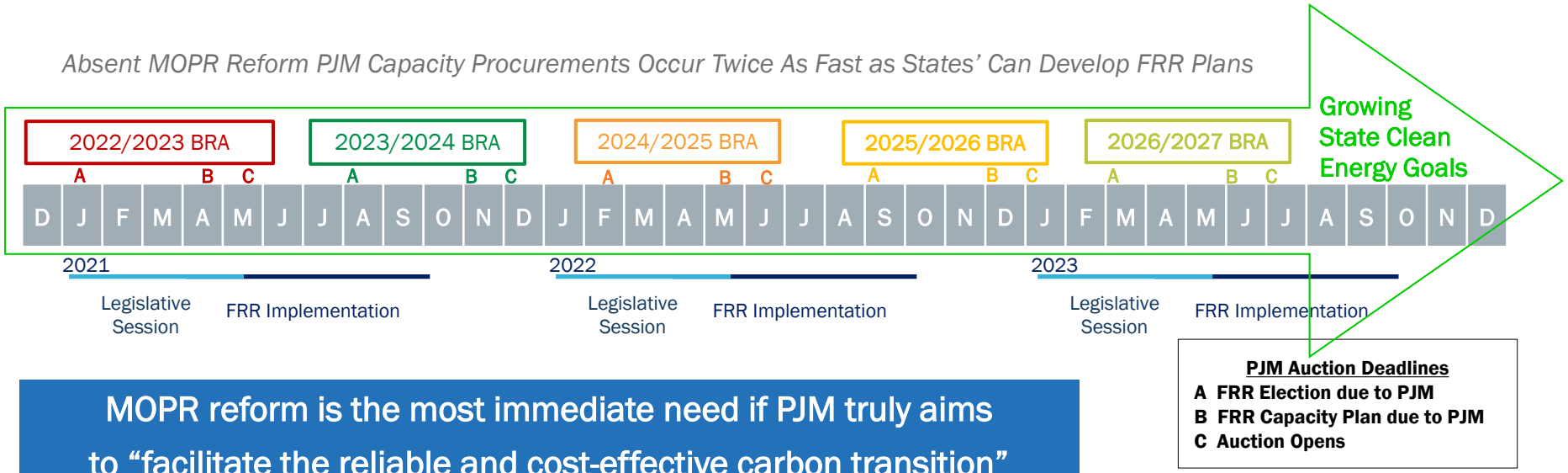
Existing MOPR Must Be Replaced to Harmonize State Policy Choices and Environmental Goals with PJM Market Design

Priority: Immediate

PJM market rules are presently undermining state policy and increasing consumer cost

- PJM's MOPR targets state environmental policy choices instead of buy-side market power
- PJM's MOPR does not facilitate state decarbonization goals, it undermines them
- PJM's MOPR may result in hundreds of millions in consumer costs increases in the next BRA
- PJM's MOPR will drastically increase consumer costs as state clean energy targets increase
- PJM's MOPR should not be applied discriminately among technologies satisfying state choices

Absent MOPR Reform PJM Capacity Procurements Occur Twice As Fast as States' Can Develop FRR Plans



MOPR reform is the most immediate need if PJM truly aims to "facilitate the reliable and cost-effective carbon transition"

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Carbon Externalities Should Be Internalized in PJM Markets

Priority: 1 year

PJM should give states technology-neutral options that they cannot achieve acting on their own

- Meaningful carbon pricing through the energy market is the most economically efficient way to achieve least-cost emission reductions, providing several benefits
  - ✓ Price signals that are time- and locationally-differentiated
  - ✓ Technology-neutral
  - ✓ Compatible with both targeted and fungible state clean energy procurement approaches
  - ✓ Revenue creation from emissions charges that can offset consumer costs or be reinvested in other programs

- PJM development of model tariff provisions that address carbon leakage can facilitate effective carbon pricing by one or more states

- Clean capacity credit concepts appear redundant to tools states already employ
  - Integrating a fungible clean capacity credit is redundant - states can already procure clean energy through competitive Tier I REC programs and align program requirements
  - Integrating multiple, non-fungible clean capacity credits will make capacity markets more complex and opaque (c.f., former demand response classes)
  - Non-discrimination requirements of the Federal Power Act must be honored

RPM Must Evolve to Address Changing System Needs

Priority: 1 year

Leverage Quadrennial Review process

Observations

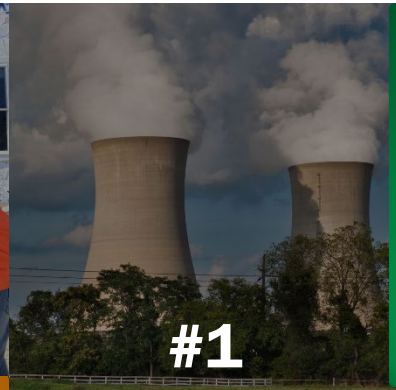
- Most states prefer electric supply that is reliable, least-cost and carbon-free
- PJM energy market should be primary driver of investment
- Systemic capacity over-supply is muting energy price signals
- Clean energy resources – Nuclear, Wind, Solar – obtain greatest value from energy market
- Emitting resources – esp. older, low-capacity-factor steam turbines with long dispatch notice requirements– get "life-support" from the capacity market yet are of diminishing value to the changing grid

Capacity Market Reforms

- Capacity market solves for resource adequacy at annual peak load, instead of periods of greatest stress - when supply and demand are tightest
- Current design does not address common mode failure
- Load Forecasting must continue to improve
- Evolving resource mix should inform choice of Reference Resource and CONE
- Consider vitality of three-year forward procurement

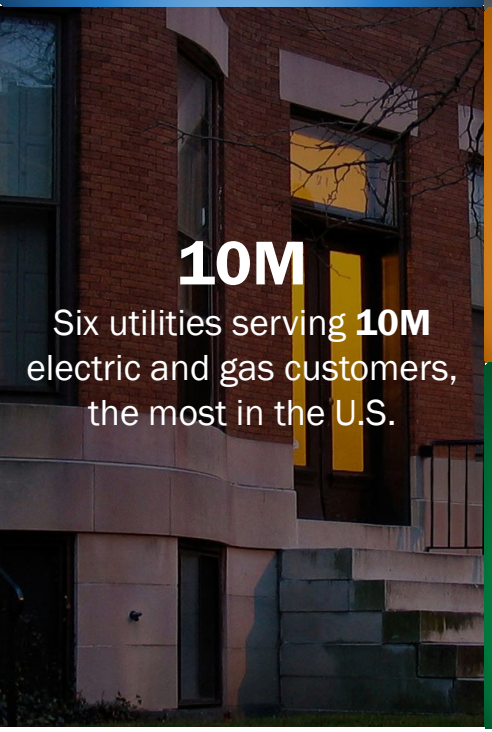
Exelon: An Industry Leader

$26B
Being invested in utilities through 2023



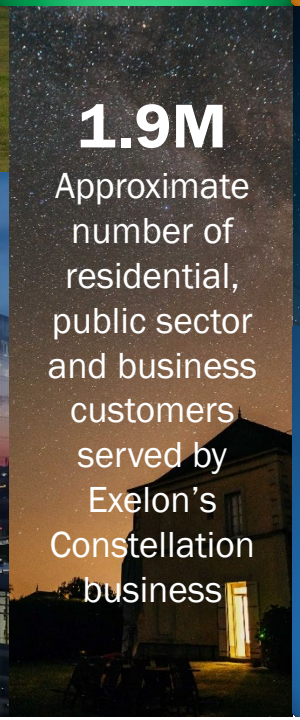
210 TWh
Customer load served

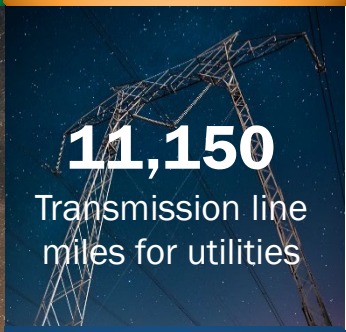
31,600
Megawatts of total power generation capacity



Nearly
251,000
Employee volunteer hours

$34.4B
Operating revenue in 2019





32,700
Employees

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