



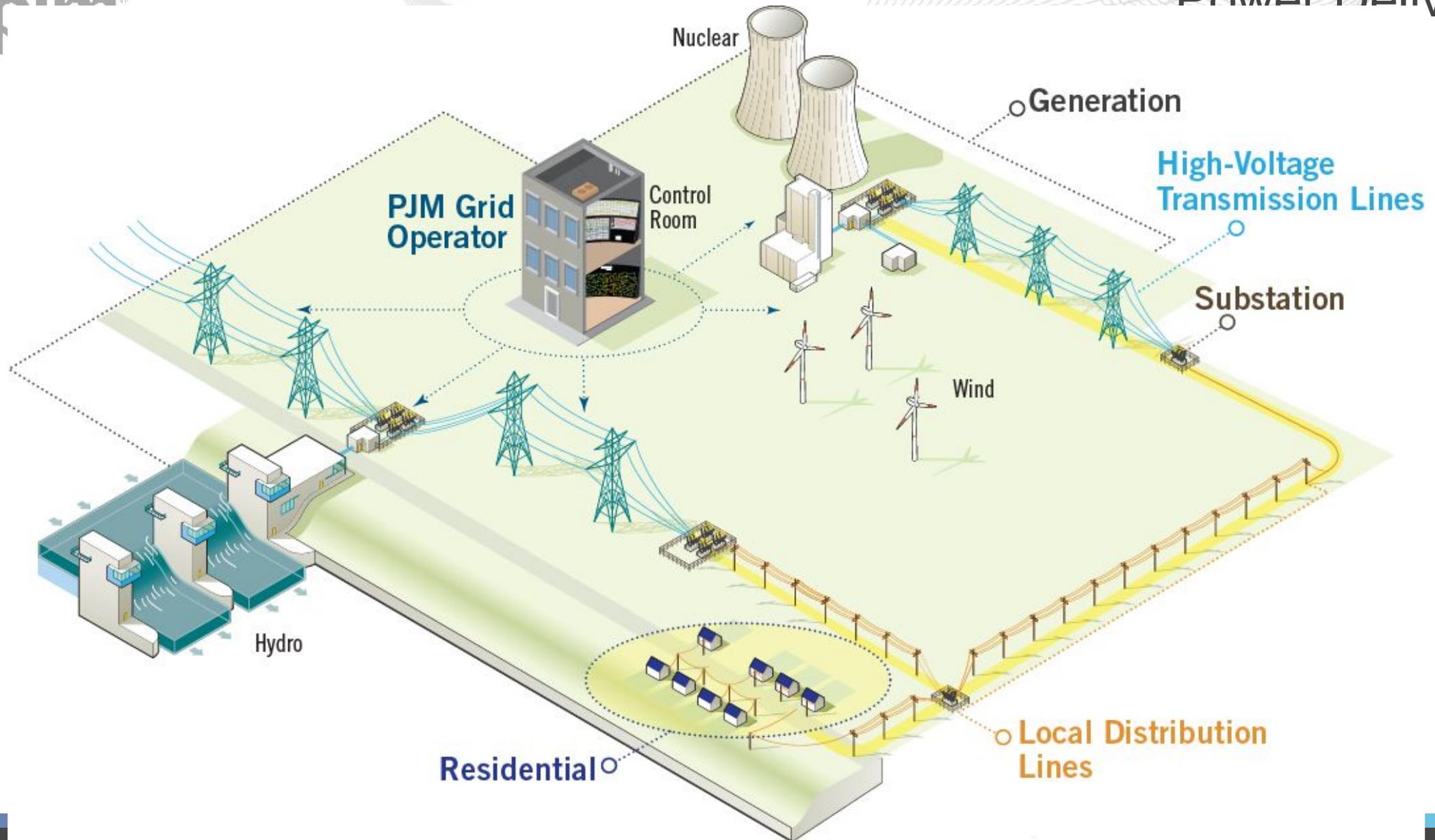
# **PJM Introduction and Ensuring A Reliable Energy Transition**

## **West Virginia Energy Summit**

***Asim Z. Haque***

SVP, State Policy and Member Services

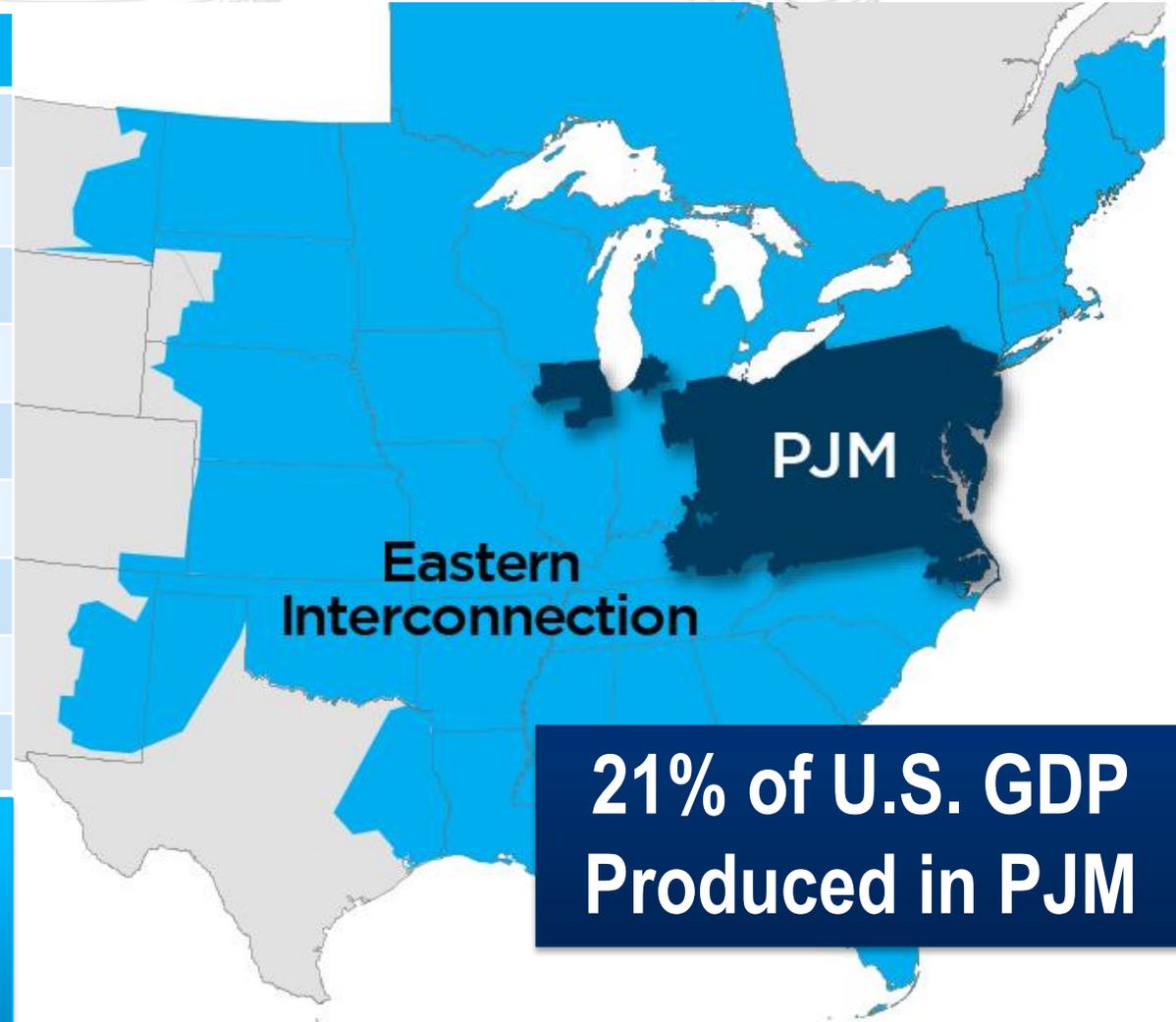
**October 24, 2023**



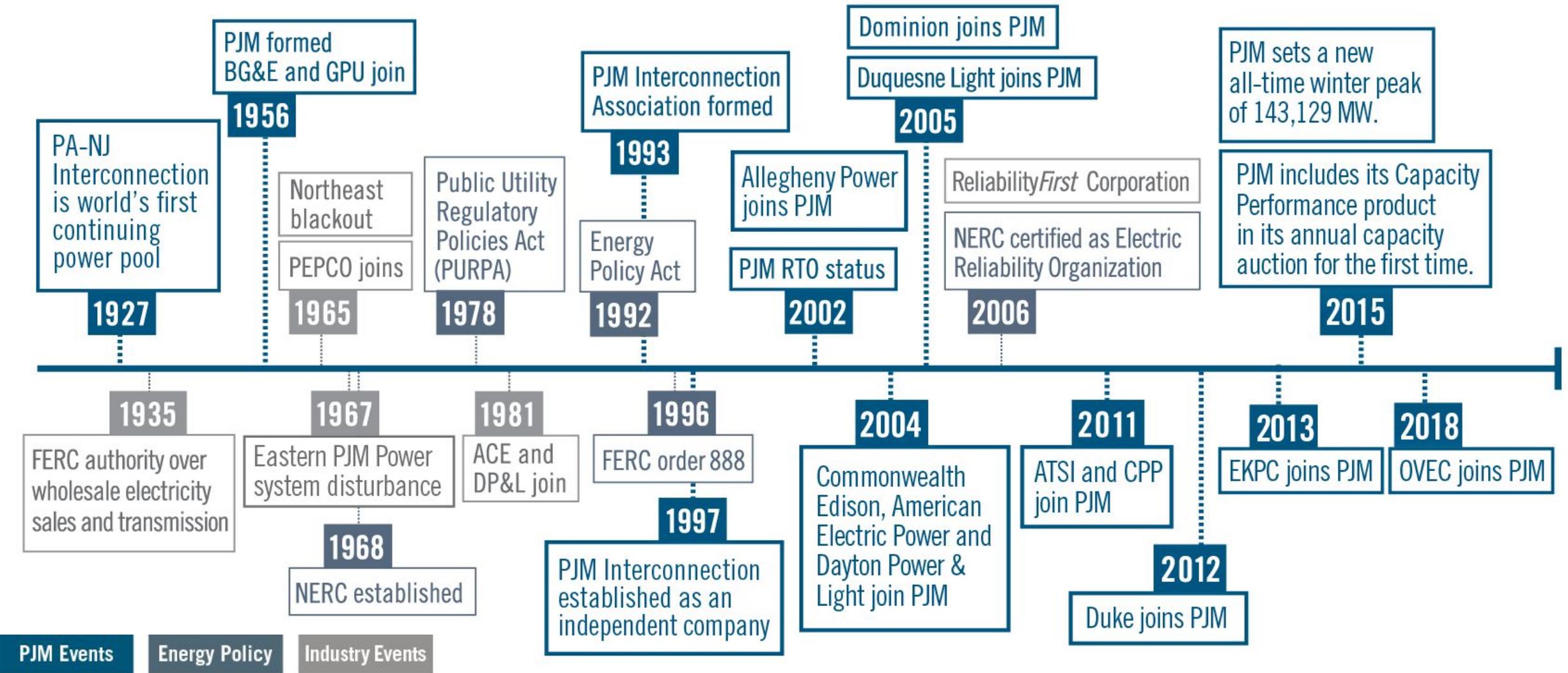
## Key Statistics

Member companies	1,060+
Millions of people served	65
Peak load in megawatts	165,563
Megawatts of generating capacity	185,442
Miles of transmission lines	85,103
2020 gigawatt hours of annual energy	782,683
Generation sources	1,436
Square miles of territory	368,906
States served	13 + DC

- 26% of generation in Eastern Interconnection
- 25% of load in Eastern Interconnection
- 20% of transmission assets in Eastern Interconnection



As of 2/2022



# How Is PJM Different from Other Utility Companies?

## PJM Does:

- Direct operation of the transmission system
- Remain profit-neutral
- Maintain independence from PJM members
- Coordinate maintenance of grid facilities

## PJM Does *NOT*:

- Own any transmission or generation assets
- Function as a publicly traded company with shareholders and concerns around “earnings”
- Perform maintenance on generators or transmission systems (e.g., repair power lines)
- Serve or direct any end-use customers (retail)

PJM  
Open Access  
Transmission  
Tariff (OATT)

Reliability  
Assurance  
Agreement

Transmission  
Owner (TO)  
Agreement

PJM Operating  
Agreement

# RELIABILITY

## Markets

- Energy
- Capacity
- Ancillary services

## Operations

- Grid operations
- Supply/demand balance
- Transmission monitoring

## Regional Planning

- 15-year outlook



## PLANNING



Planning for the future like...



## OPERATIONS



Matches supply with demand like...

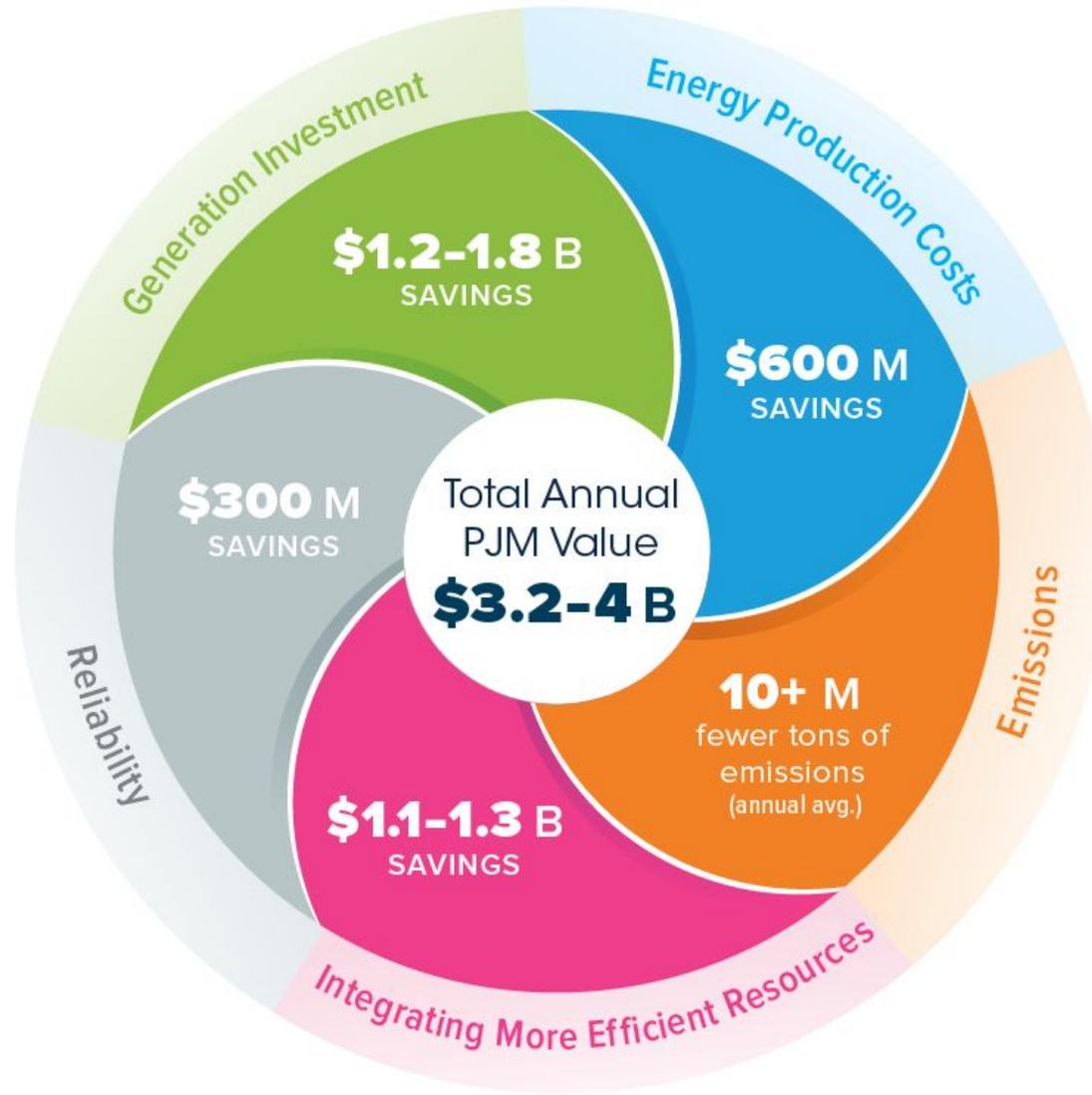


## MARKETS



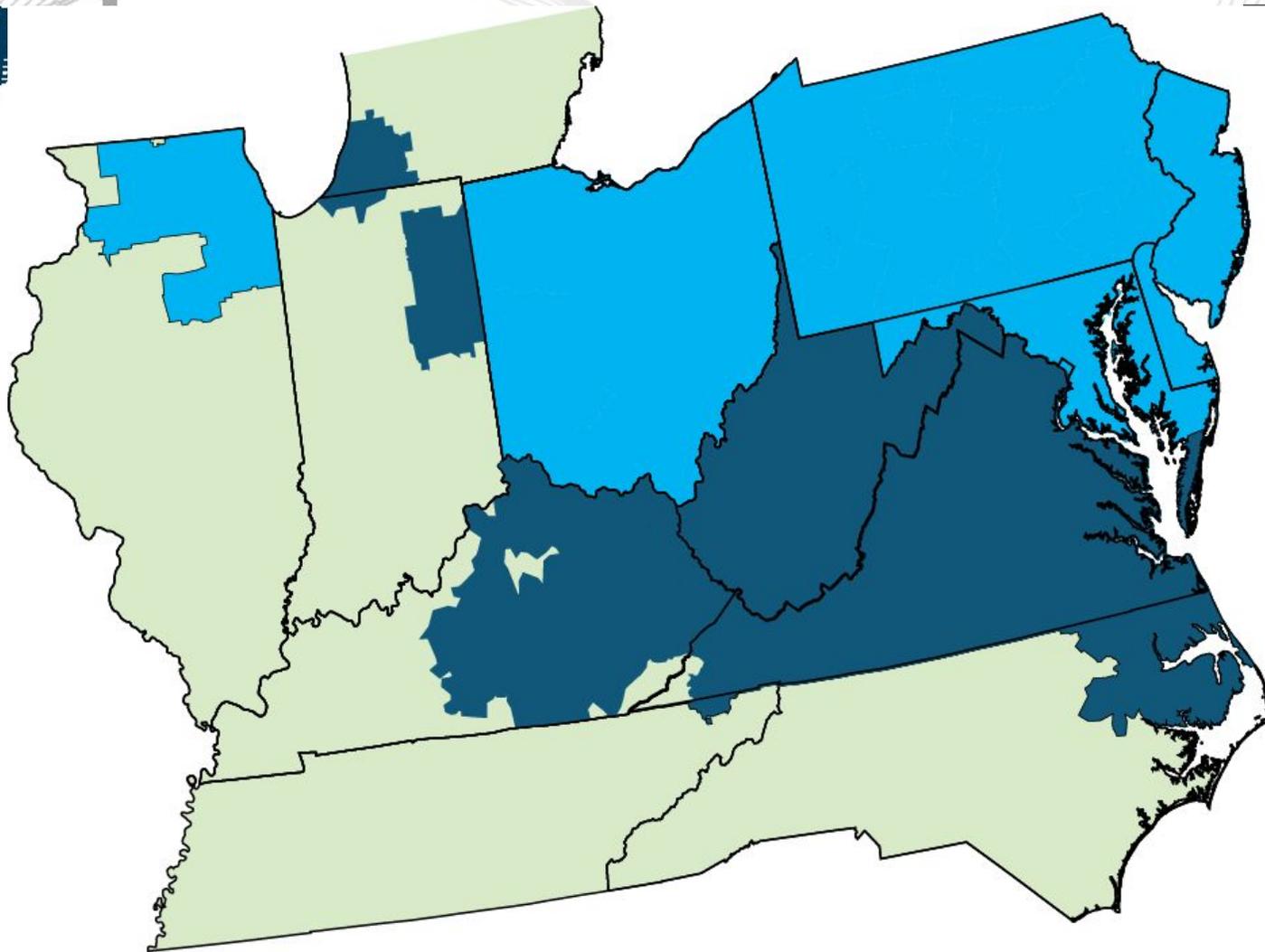
Energy Market Pricing like...





— All numbers are estimates. —

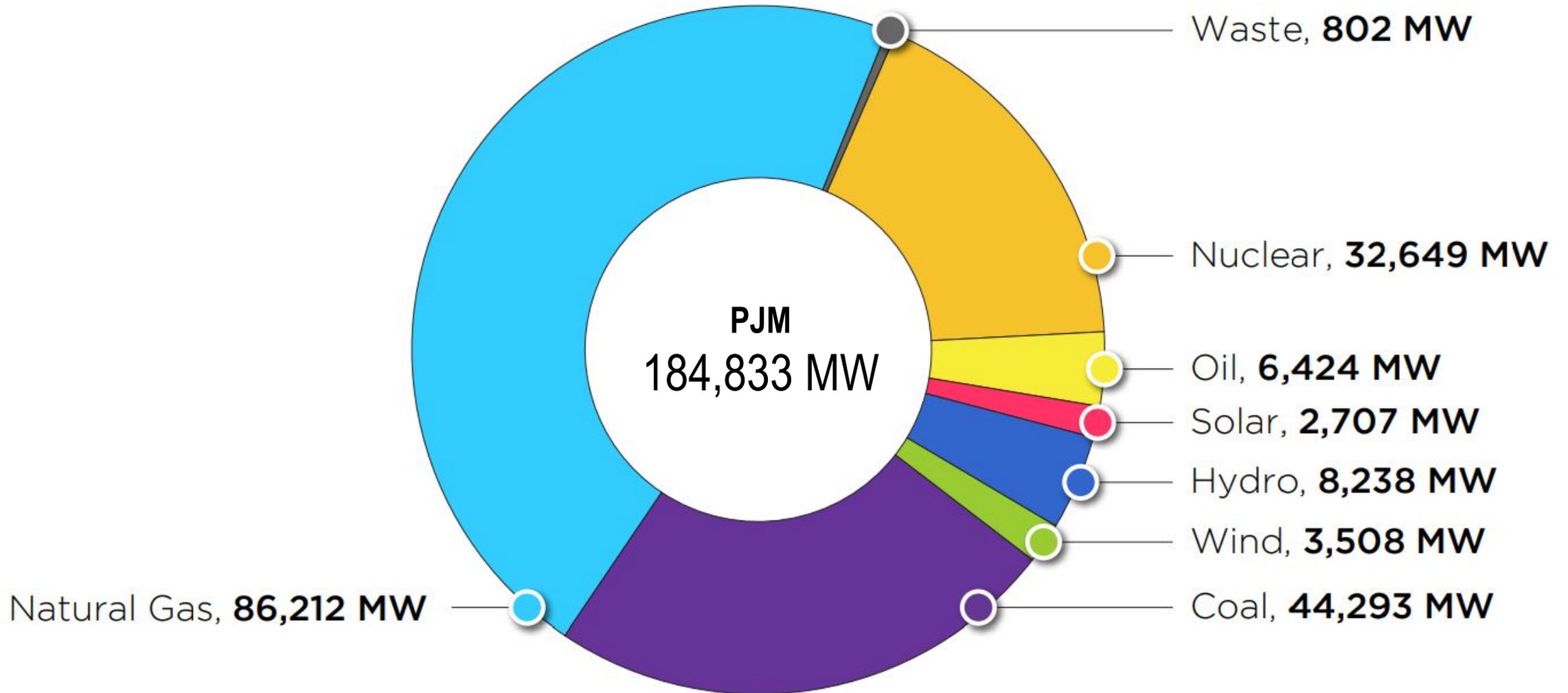
# Retail Regulatory Construct



**Note:** In the non-PJM portion of the PJM region, *Michigan* allows up to 10% of retail customers to choose their electricity suppliers.

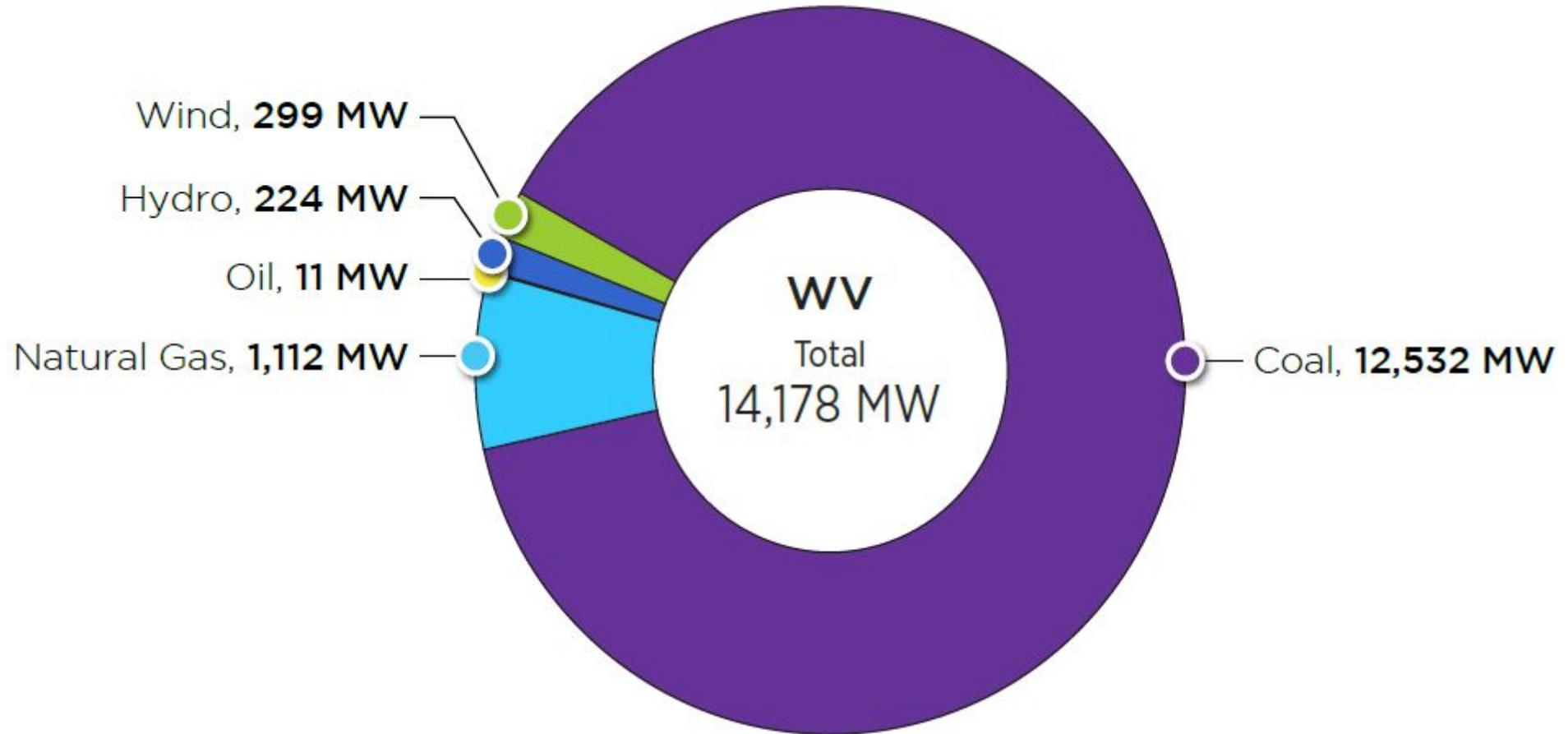
# PJM – Existing Installed Capacity

(CIRs – as of Dec. 31, 2022)



# West Virginia – Existing Installed Capacity

(CIRs – as of Dec. 31, 2022)

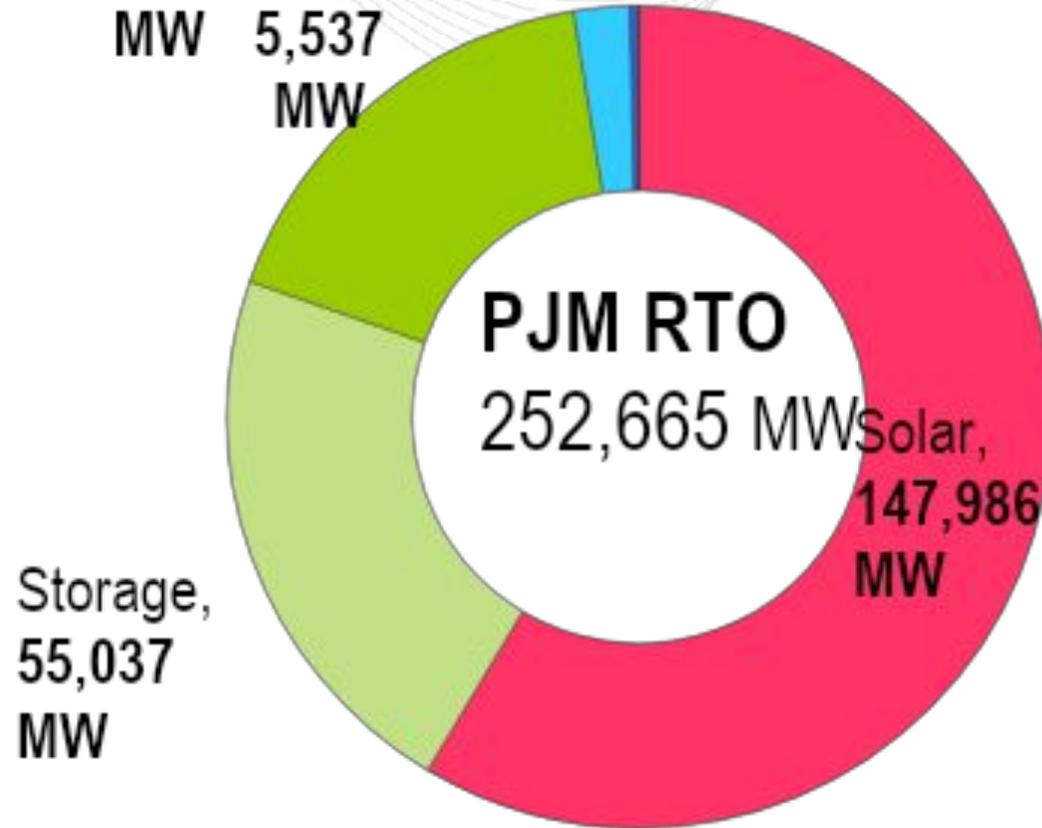




# PJM Queued Capacity (Nameplate) by Fuel Type

("Active" in the PJM Queue as of April 1, 2023)

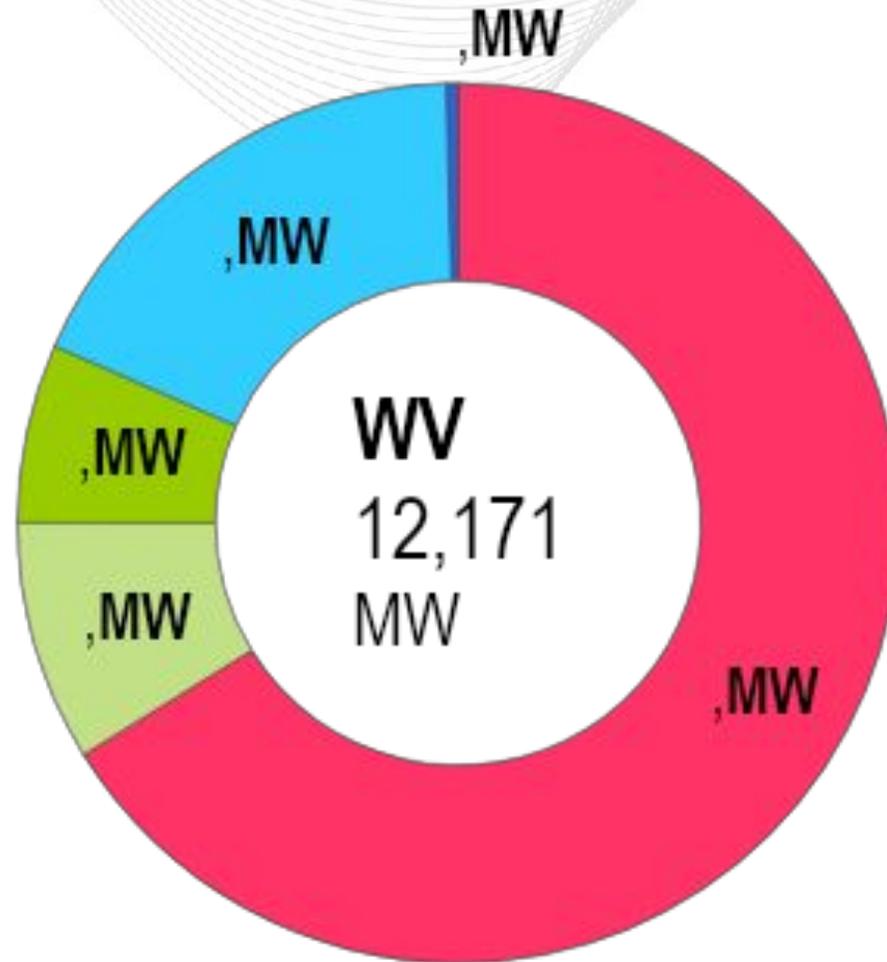
Wind\*, Natural Hydro, Other,  
43,221 MW Gas, 824 MW  
60 MW  
5,537 MW



\*Wind includes both onshore and offshore wind

# West Virginia Queued Capacity (Nameplate) by Fuel Type

("Active" in the PJM Queue as of April 1, 2023)



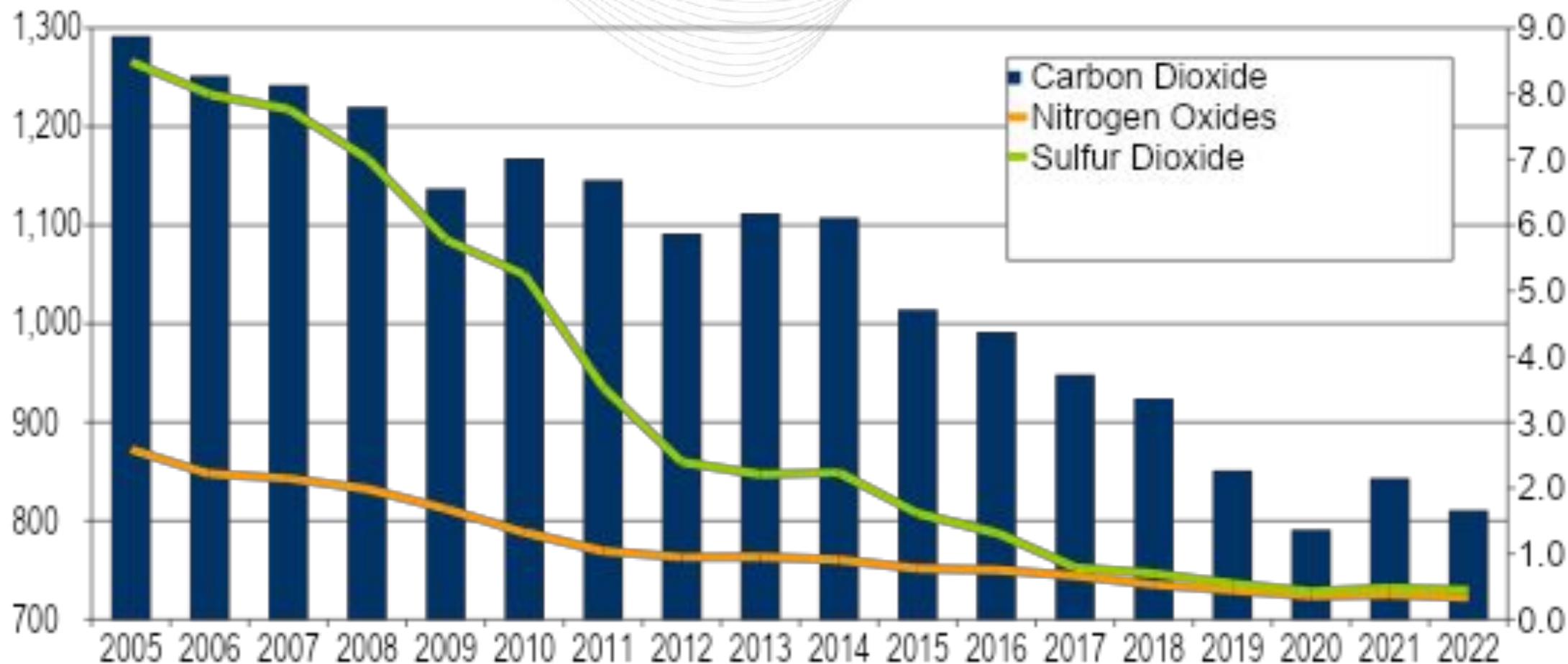


# 2005 – 2022 PJM Average Emissions

(March 2023)

CO2 (lbs/MWh)

SO2 and NOx(lb)



**Reliability in PJM: Today and Tomorrow**  
 PJM Interconnection  
 March 11, 2021  
 For Public Use

**Energy Transition in PJM:  
 Resource Retirements, Replacements & Risks**  
 Feb. 24, 2023  
 For Public Use

**Energy Transition in PJM: Emerging Characteristics of a Decarbonizing Grid – Addendum**

**Introduction**  
 This document contains supporting information for the PJM white paper, *Emerging Characteristics of a Decarbonizing Grid* (ECG), based on stakeholder questions described below were used in the second phase of analysis, which began in 2021. Future phases of the study will include updates to core assumptions and addendums.

**Scenario Development**

**State and Corporate Policy Analysis**  
 In order to inform scenario development, PJM analyzed goals and policies of states and potential generation retirements. PJM used two time frames to inform its referenced medium-term policy goals through 2035, and the Accelerated scenario through 2021. The goals and policies of states and utilities described below were updated to reflect changes that began in 2021. As these policies and goals continue to evolve, PJM will continue to inform the assumptions in future phases of the study.

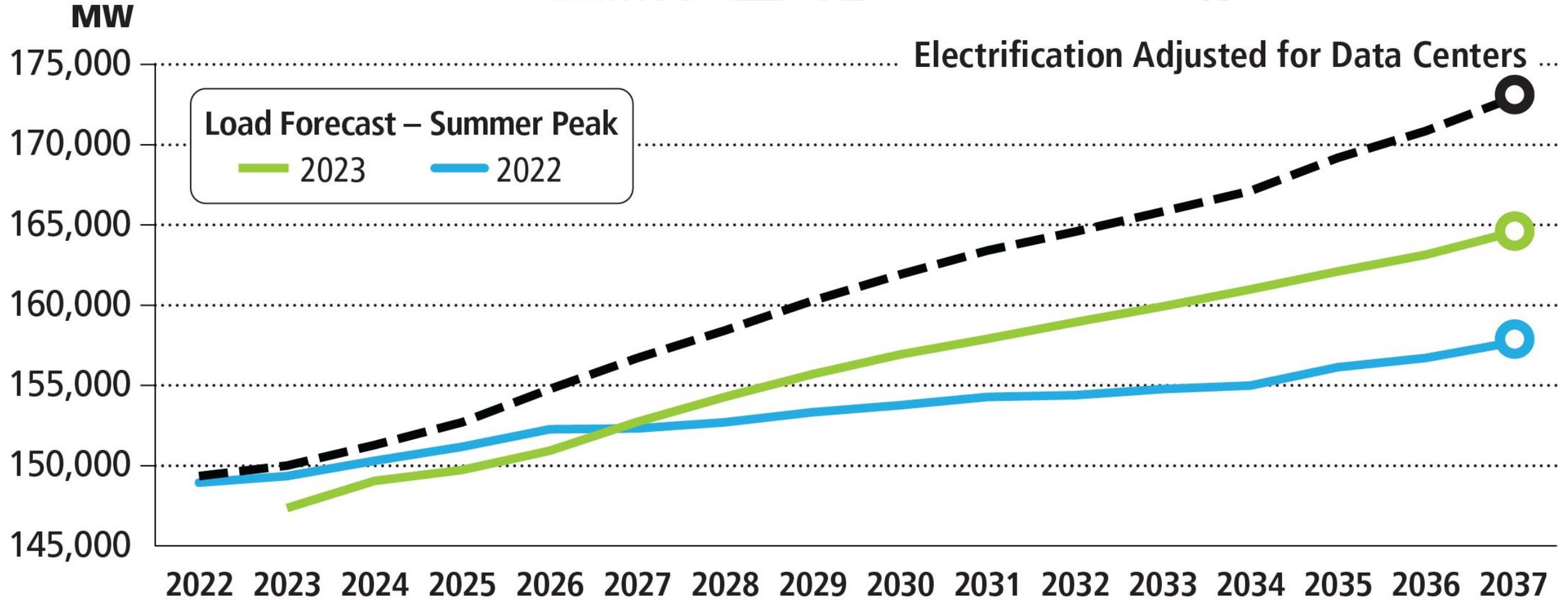
**State Goals**  
 State Renewable Portfolio Standards (RPS) require suppliers to use wind, solar, and other renewable sources to serve increasing percentages of total demand. The following RPS policies are included in this phase of analysis:

<b>NJ</b> ■ 50% by 2030	<b>DC</b> ■ 100% by 2032	<b>VA</b> ■ 100% by 2050
<b>MD</b> ■ 50% by 2030	<b>PA</b> ■ ■ 18% by 2021	<b>NC</b> ■ 12.5% by 2021
<b>DE</b> ■ 40% by 2035	<b>IL</b> ■ 25% by 2026 <small>(This phase of the study was conducted prior to CEJA, which will be incorporated in the next phase of analysis.)</small>	<b>OH</b> ■ 8.5% by 2026

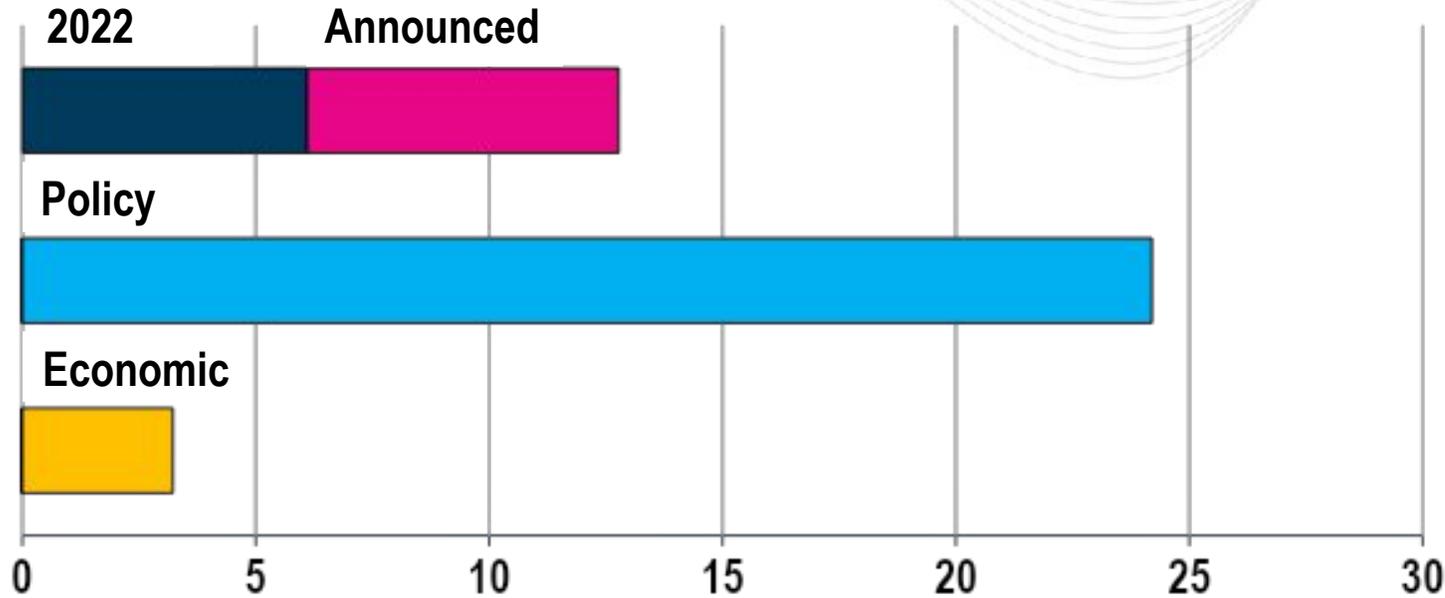
Includes: ■ Minimum solar requirement ■ Non-renewable alternative

CEJA stands for Illinois' Climate and Equitable Jobs Act.  
[www.pjm.com](http://www.pjm.com) | For Public Use

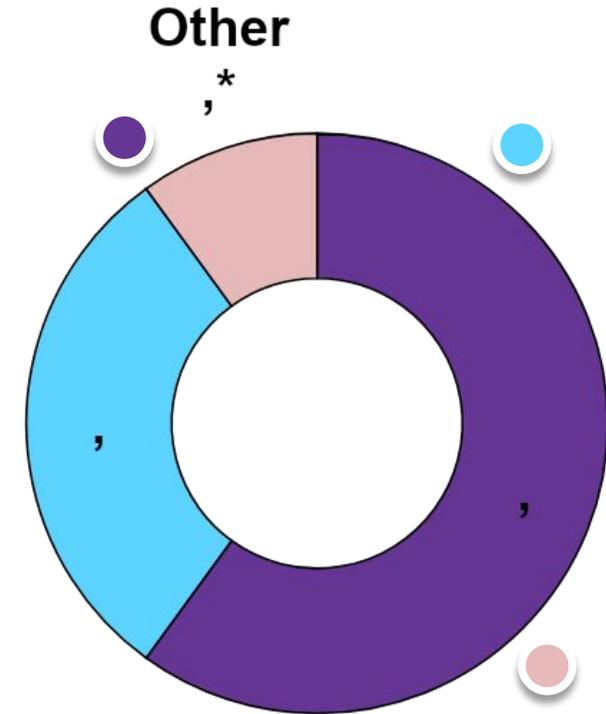
**Energy Transition in PJM:  
 Frameworks for Analysis**  
 Dec. 15, 2021  
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## Total Forecasted Retirement Capacity (GW)



This 40 GW represents  
**21% of PJM's current**  
 192 GW of installed generation

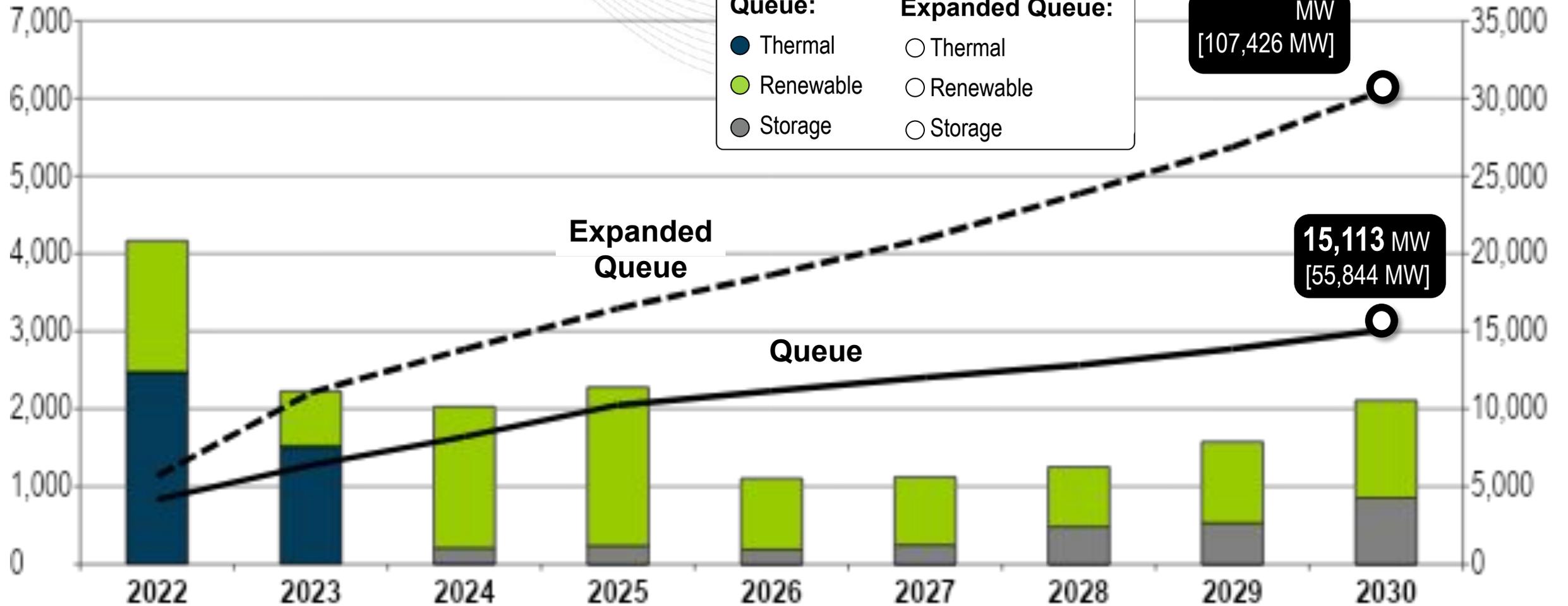


\*Other includes diesel, etc.

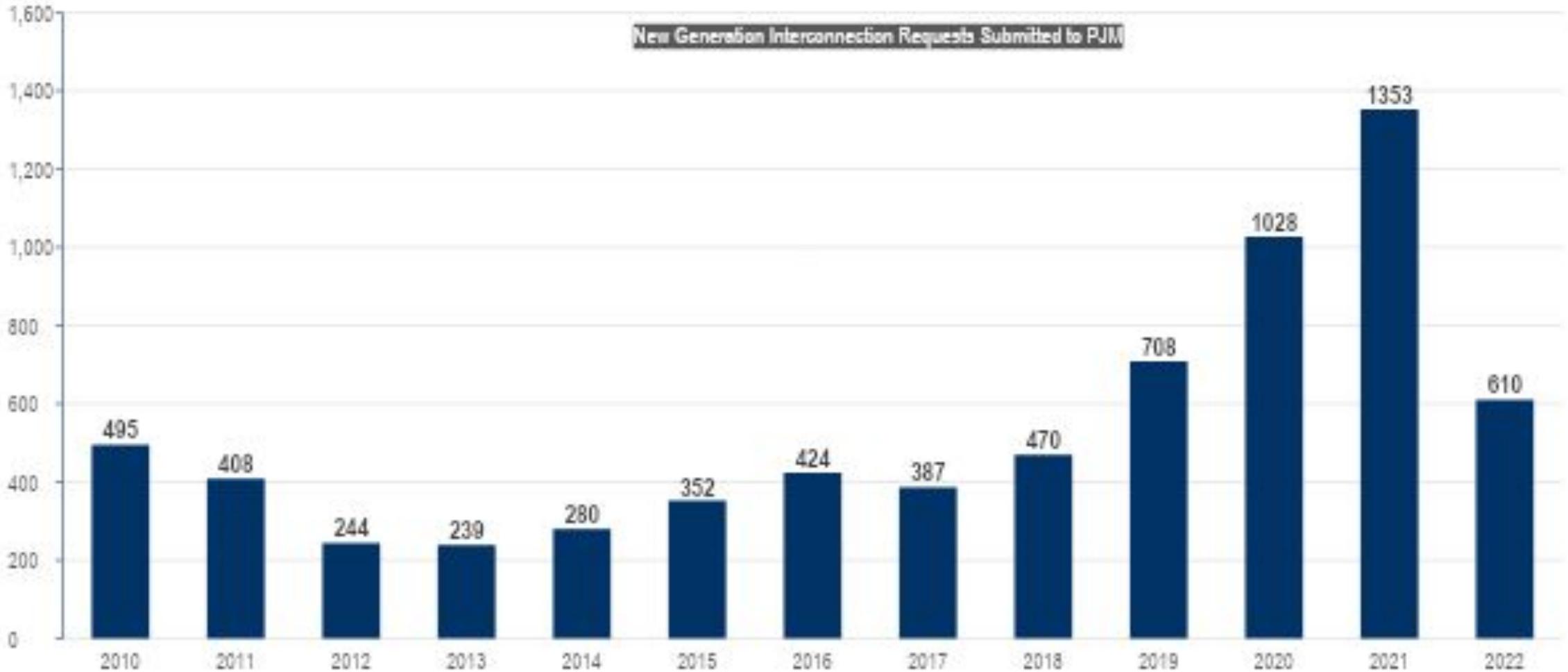
# PJM Forecasted New Entry (2022–2030)

**Total Added Capacity [Nameplate]**

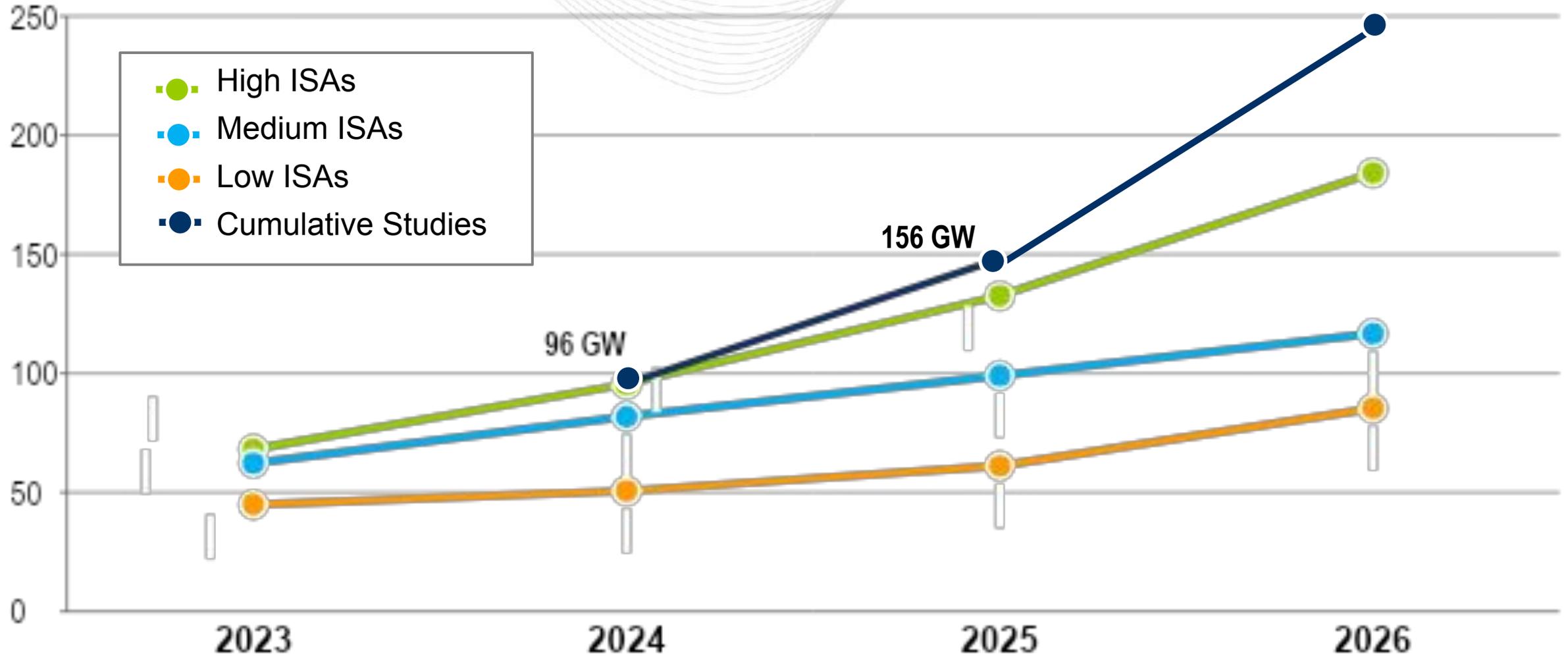
**Annual Added Capacity (MW)**



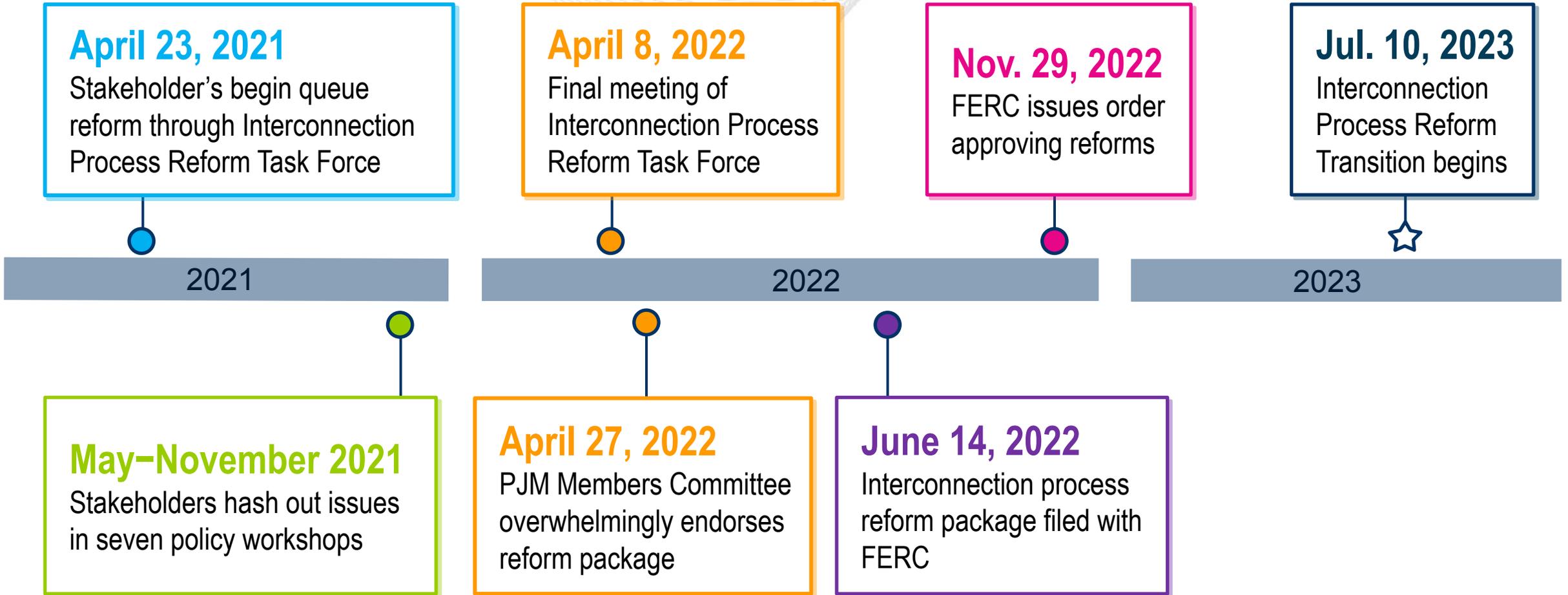
# Interconnection Queue Projects By Year



GW



# Interconnection Process Reform Timeline



## RELIABILITY



The PJM fleet has adequate resources and enough essential reliability services, but we need our generators to perform when called upon.

### Energy Transition in PJM: Resource Retirements, Replacements & Risks

Feb. 24, 2023

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Generation retirements may outpace new entry with a simultaneous likelihood of load increasing, thereby creating resource adequacy concerns.

### Energy Transition in PJM: Frameworks for Analysis

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We will continue to need some amount of thermal generation to provide certain essential reliability services until a replacement technology is deployable at scale.

## The Immediate Concern



**Support**  
Resource  
Performance

## The Near-Term Concern

**Energy Transition in PJM:**  
Resource Retirements, Replacements & Risks

Feb. 24, 2023

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**Ensure**  
Resource  
Adequacy

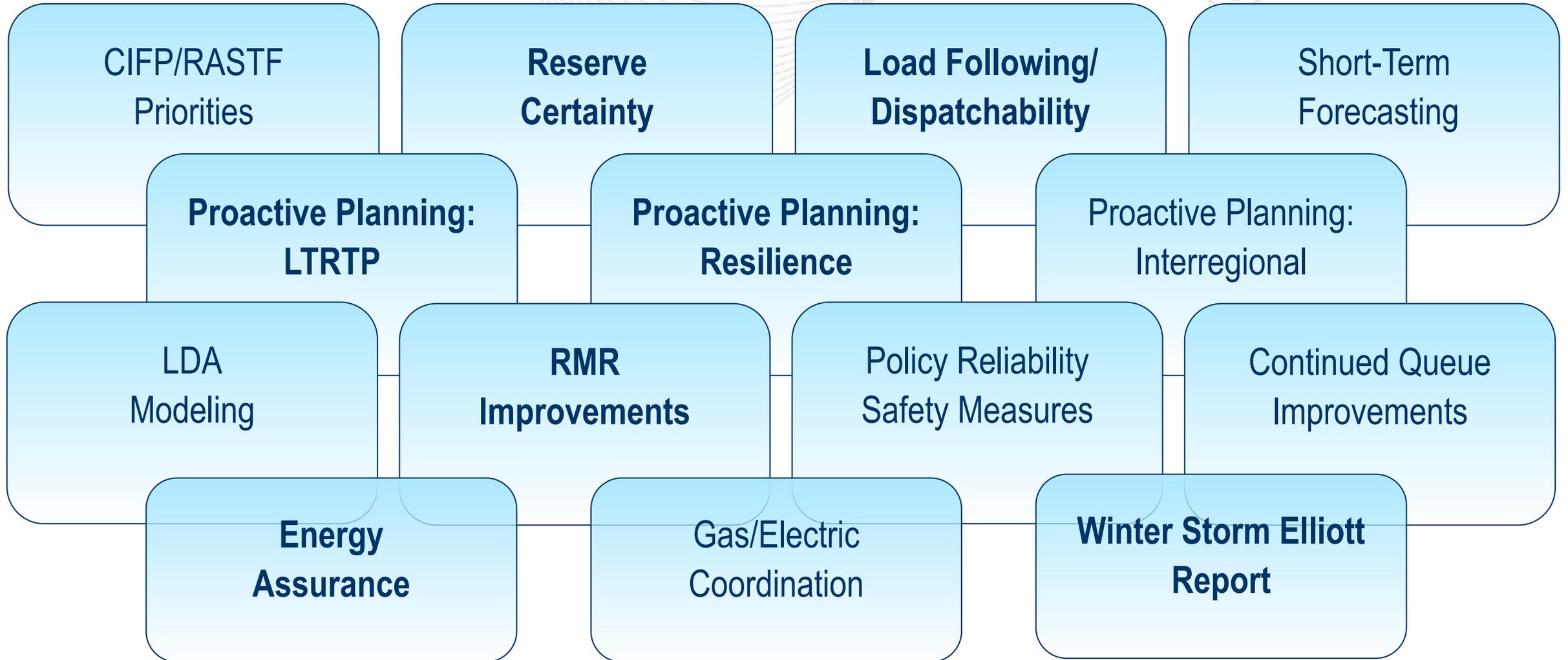
## The Upcoming Concern

**Energy Transition in PJM:**  
Frameworks for Analysis

Dec. 15, 2021

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**Maintain & Attract**  
Essential Reliability  
Services





# Thank You! and Questions