Reliability in the Balance – PJM and PA

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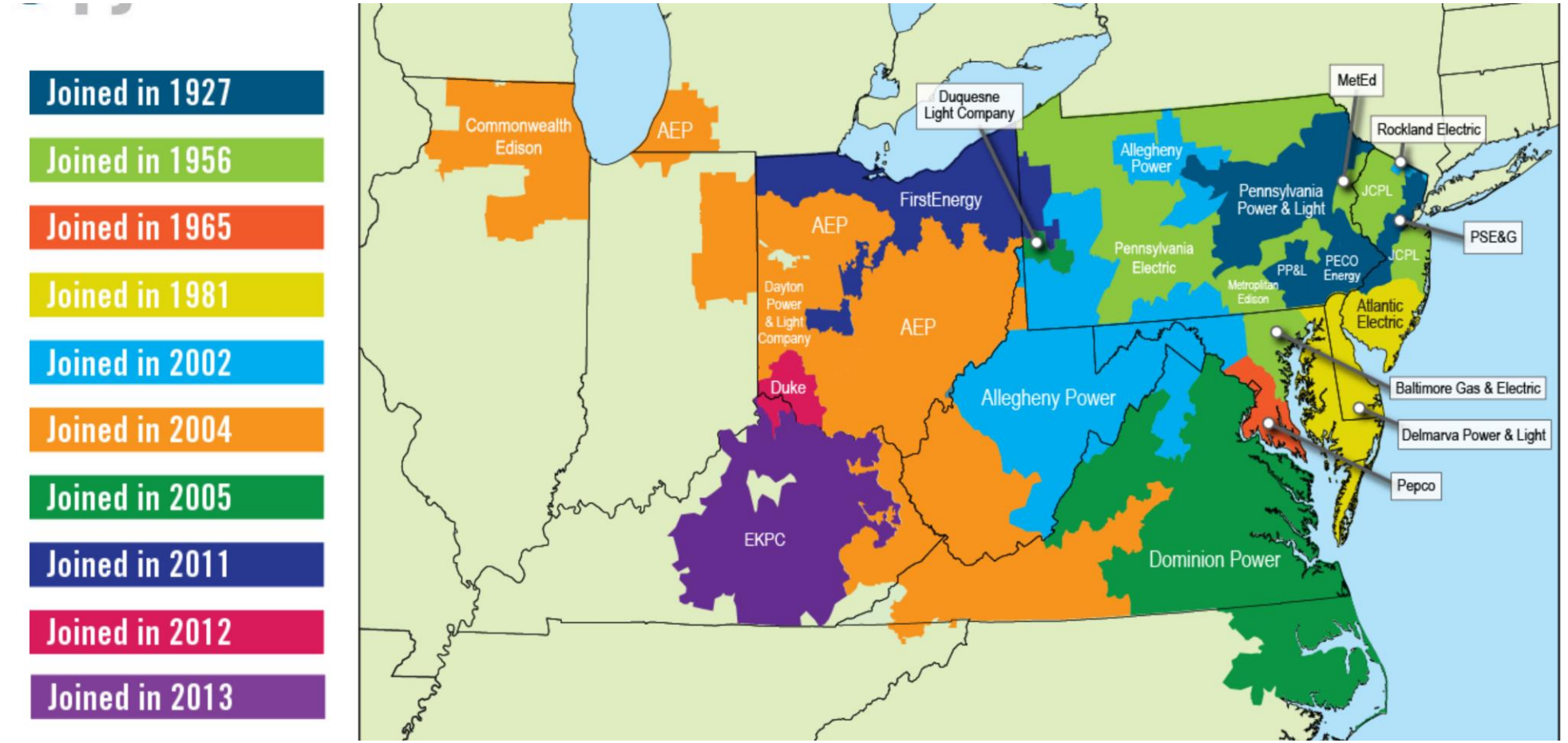
May 1, 2023

What is PJM?


Joined in 1927
Joined in 1956
Joined in 1965
Joined in 1981
Joined in 2002
Joined in 2004
Joined in 2005
Joined in 2011
Joined in 2012
Joined in 2013
Commonwealth Edison
AEP
Duquesne Light Company
FirstEnergy
AEP
Dayton Power & Light Company
AEP
Duke
EKPC
Allegheny Power
Pennsylvania Electric
Allegheny Power
Pennsylvania Power & Light
PP&L
Metropolitan Edison
PECO Energy
JCPL
JCPL
Atlantic Electric
Dominion Power
MetEd
Rockland Electric
PSE&G
Baltimore Gas & Electric
Delmarva Power & Light
Pepco

What trends are we seeing in the PJM Market?

- Demand is rising faster than historic rates.
- Retirements are happening faster than anticipated - PJM projects that 20% of its existing capacity will retire between now and 2030 – approximately 40 GW.
- Replacement capacity is not of the quality and quantity necessary to sustain reliability.
- As a result, at the current trajectory, PJM is not going to have sufficient power to meet the demands of consumers and prices are likely to increase.

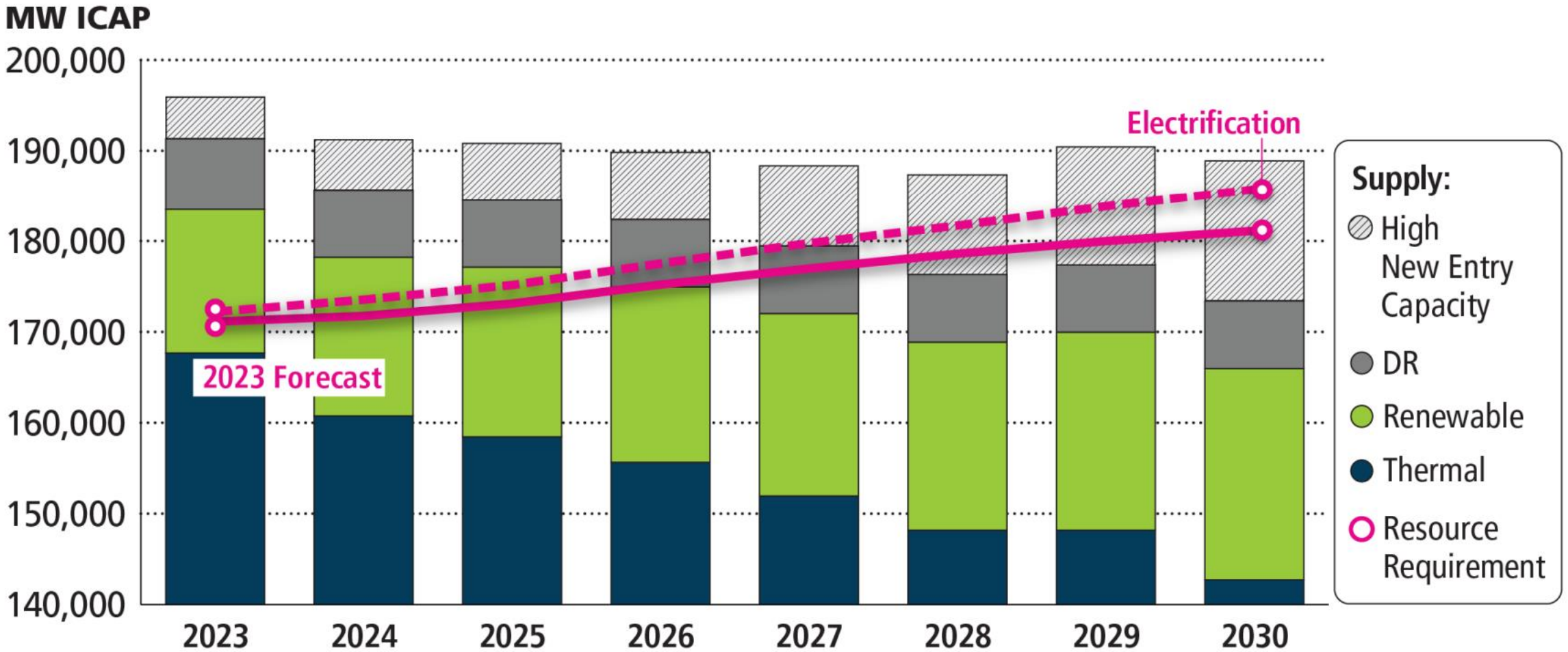
Why is demand increasing?

- Electric vehicle proliferation.
- Electric building proliferation.
- Data centers and crypto-mining.

Why are baseload resources retiring?

- Economic Pressure - PJM's Capacity Market is clearing at historically low levels. Last auction cleared at $28/MwDay versus Cost of New Entry at $293/MwDay
- Pressure from federal and state environmental regulations.
- State mandated closures.

The Balance Sheet

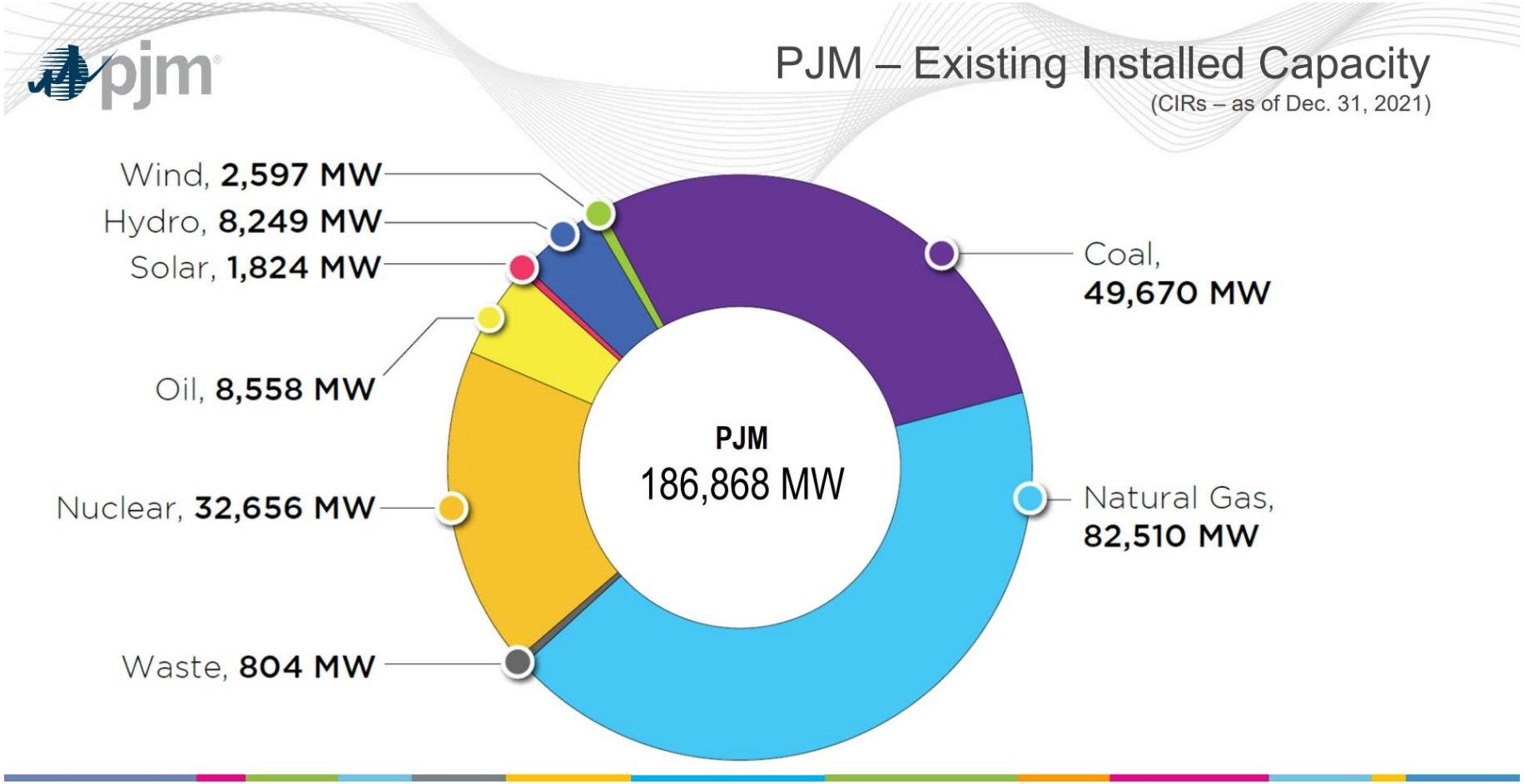


Reserve Margin Projections Under Study Scenarios

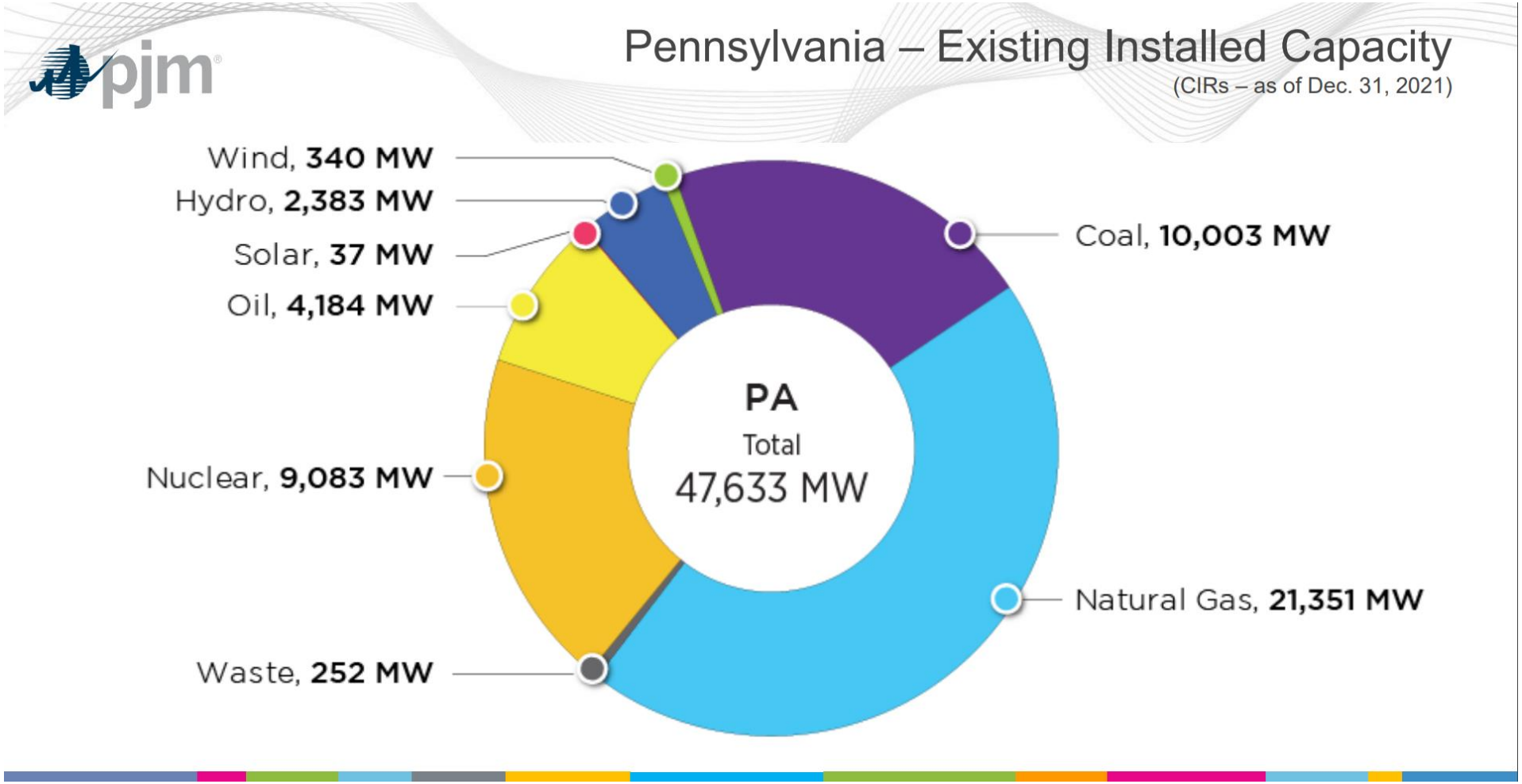
For the first time in recent history, PJM could face decreasing reserve margins should trends of high load growth, increasing rates of generator retirements, and slower entry of new resources continue.

Reserve Margin	2023	2024	2025	2026	2027	2028	2029	2030
Low New Entry								
2023 Load Forecast	23%	19%	17%	15%	11%	8%	8%	5%
Electrification	22%	18%	16%	13%	10%	7%	6%	3%
High New Entry								
2023 Load Forecast	26%	23%	21%	19%	17%	16%	17%	15%
Electrification	25%	22%	20%	18%	15%	14%	14%	12%

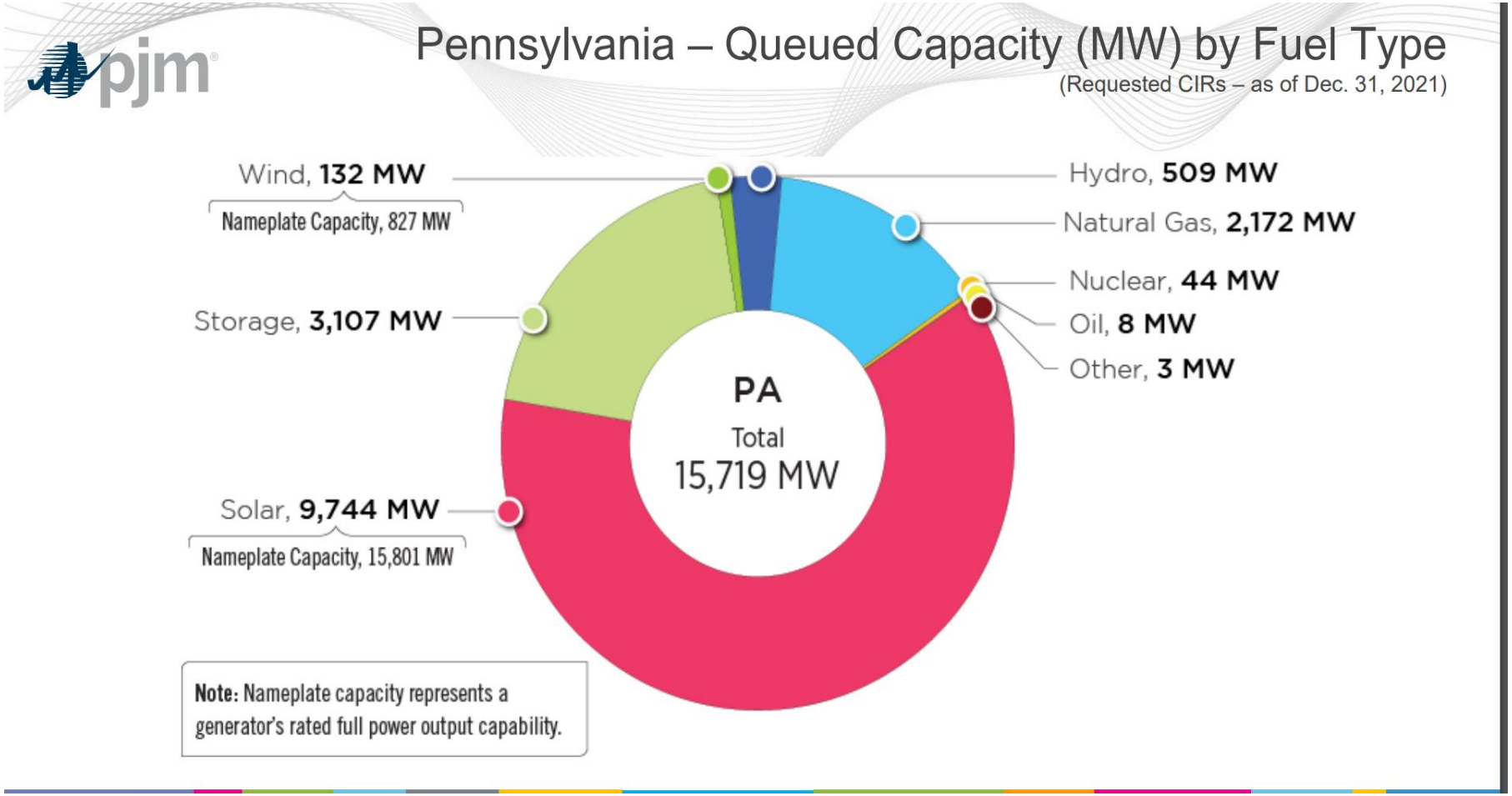
PJM Generation Mix



PA Generation Mix



PA Queue


Pennsylvania – Queued Capacity (MW) by Fuel Type
(Requested CIRs – as of Dec. 31, 2021)
Wind, 132 MW
Nameplate Capacity, 827 MW
Storage, 3,107 MW
Solar, 9,744 MW
Nameplate Capacity, 15,801 MW
Hydro, 509 MW
Natural Gas, 2,172 MW
Nuclear, 44 MW
Oil, 8 MW
Other, 3 MW
PA
Total
15,719 MW
Note: Nameplate capacity represents a generator's rated full power output capability.

How did we get here?

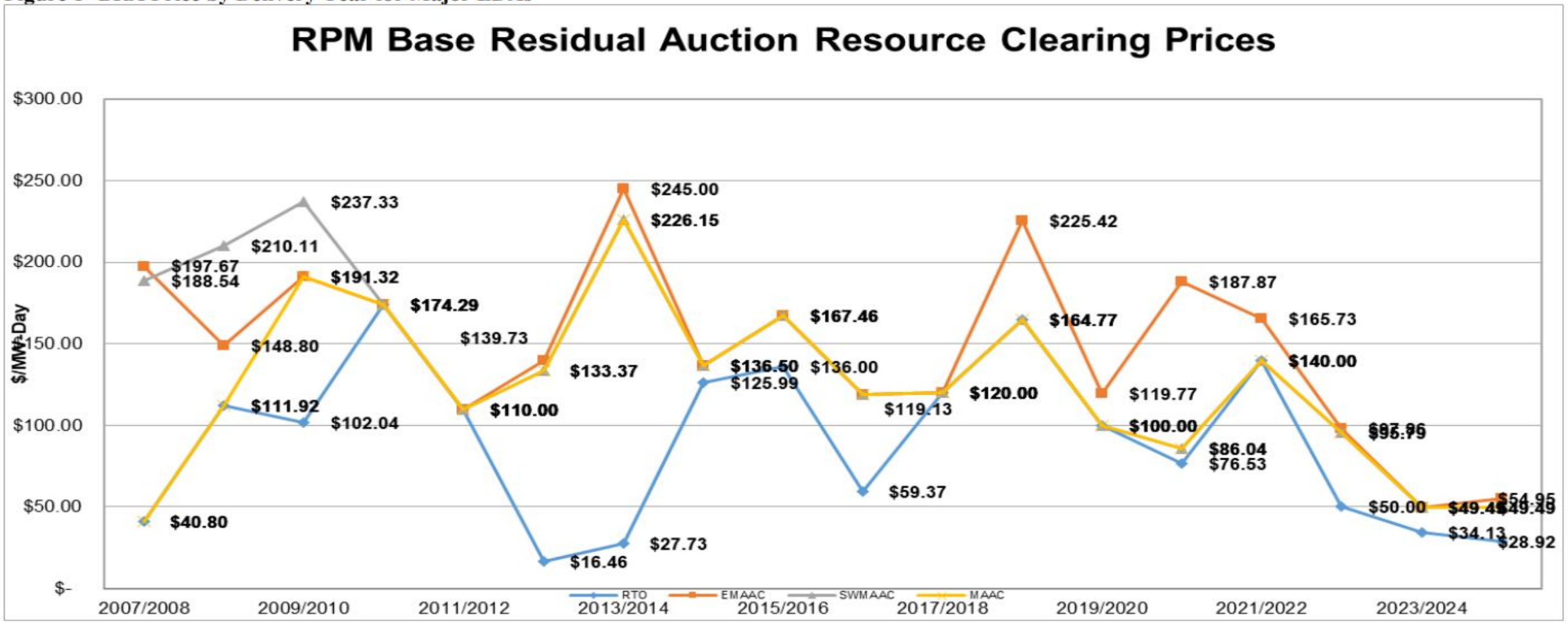
- A series of misguided decisions by PJM and FERC have made PJM a less attractive place to invest capital and encouraged existing resources to retire.
- Historically low energy and capacity prices.
- State and federal policies have led to the closure of facilities.

PJM and FERC Decisions/ Events

- Repeal of Minimum Offer Price Rule (2019)
- Imposition of onerous Capacity Market Seller Offer Caps (2021)
- Reversal of Operating Reserve Demand Curve (2022)
- Revised Capacity Market Demand Curve Parameters that discourage investment (2023)
- Change of rules in the middle of an auction to get a desired result (2023)
- Winter Storm Elliot (2022)

Historically Low Capacity Prices

Figure 1- BRA Price by Delivery Year for Major LDAs



* 2014/2015 through 2024/2025 Prices reflect the Annual Resource Clearing Prices.

State Policy - New Jersey

- Under current law and executive order:
  - New Jersey's nuclear units (3500 MW), that are directly competing with PA nuclear units, are receiving a subsidy of $300 million through at least 2025.
  - New Jersey plans to support 11,000 MW of offshore wind by 2040 with out of market subsidies. Transmission costs are still being evaluated.
  - New Jersey has a goal of 2000 MWs of energy storage by 2030 (financing has yet to be determined)
  - On Feb 15, 2023, Governor Murphy set goal for NJ to provide for 100% of the electricity sold in the State to be derived from “clean” sources by 2035.

State Policy - Maryland

- Maryland will require that 50% of electricity consumed in the state be from renewable energy resources by 2030.
- Maryland has contracted for 2000 MWs of offshore wind and Governor Moore has a stated goal of 8500 MW’s of offshore wind.
- Governor Moore has set a goal of 100% “clean” energy by 2035.

State Policy - Illinois

- Illinois will require all private coal and natural gas-fired units to reach zero emissions by either 2030, 2035 or 2045, depending on ownership, location and rates of emissions.
- Policy of state is to be 100% “clean” by 2050.
- State goal is to be 50% renewable by 2040.
- Illinois will provide $700 million over the next 5 years to subsidize nuclear facilities in the state.
- Illinois will provide $580 million a year to support wind and solar development.

Energy Prices around PA– 2021 Average Retail Rates

Maryland – 11.48 cents/kwh

New Jersey – 14.01 cents/kwh

New York – 16.11 cents/kwh

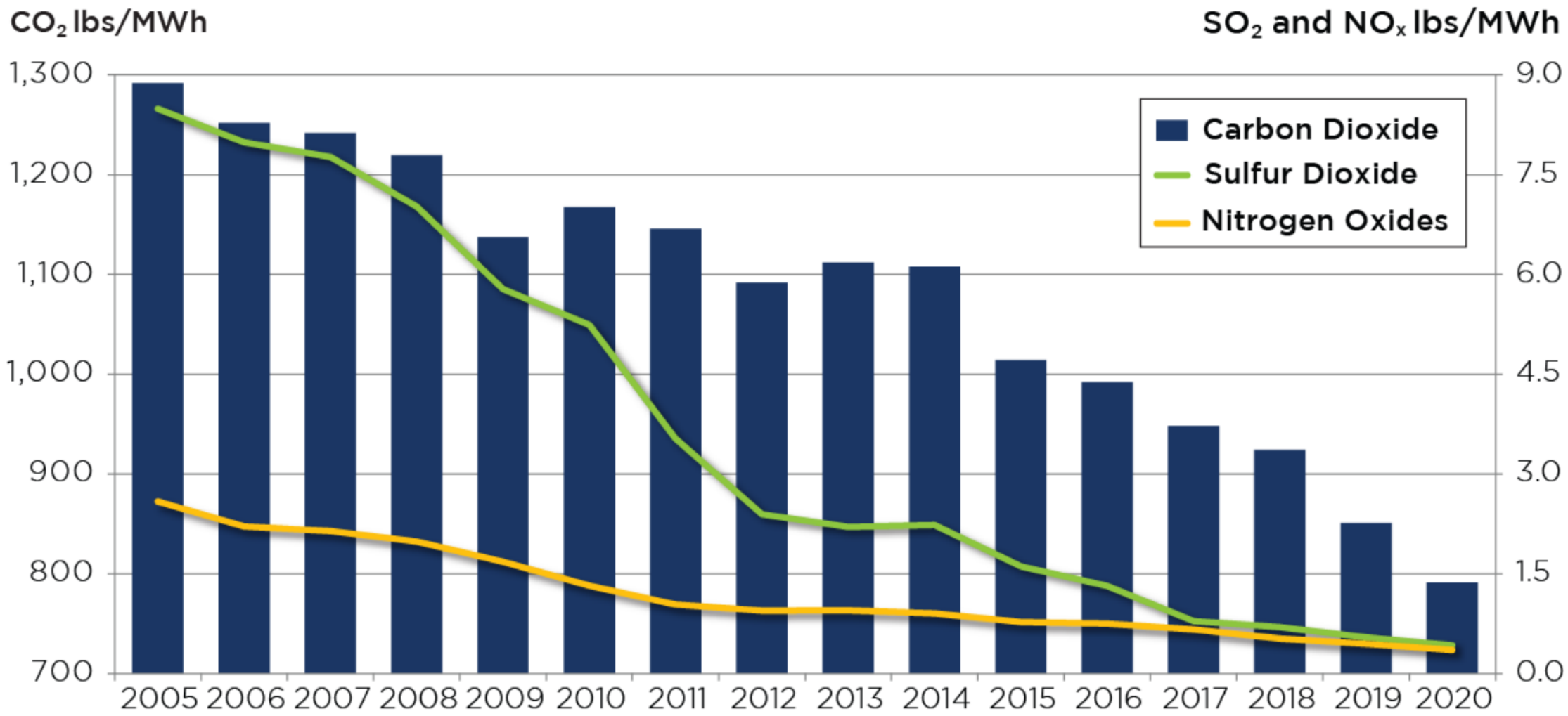
Pennsylvania – 9.97 cents/kwh

Ohio – 9.76 cents/kwh

National Average - 11.10 cents/kwh

Source: https://www.eia.gov/electricity/state/

Figure 1. PJM System Average Emission Rates



What will reverse the current trend?

- PJM and FERC change capacity market rules to encourage the retention of existing resources that are needed for reliability and the development of new resources.
- Federal and state policymakers make decisions that support and not undermine reliability.
- Federal and state policymakers consider reliability when developing environmental regulations.
- Interconnection queue reform.

What can the Committee do?

- Get educated on PJM issues.
- Advocate for Pennsylvania's interests
- Prioritize reliability and affordability.
- Talk to colleagues in other states about the importance of power reliability and affordability.
- Pressure PJM, PUC and FERC to make decisions that support Pennsylvanians competitive model which use competitive markets to drive reliability.
- Consider a Plan B.
- Be vocal!