



# 2023 Pennsylvania State Infrastructure Report (January 1, 2023 – December 31, 2023)

June 2024

## Planning

- Generation Portfolio Analysis
- Transmission Analysis
- Load Forecast

## Markets

- Market Analysis
- Net Energy Import/Export Trend

## Operations

- Generator Production
- Emissions Data

## In the Pennsylvania service territory:



### Existing Capacity:

- In Pennsylvania, natural gas represents 52% of the total installed capacity while nuclear represents 20% and coal 17%.
- In PJM, natural gas and coal are 48% and 22% of total installed capacity, while nuclear represents 18%.



### Interconnection Requests:

- Solar represents 74% of new interconnection requests while storage represents 24% of new requests.



### Deactivations:

- 1,936.6 MW of generation deactivated in Pennsylvania in 2023.
- An additional 760 MW of generation announced its intention to deactivate in future years.



### RTEP 2023:

Pennsylvania's 2023 RTEP project total represents approximately \$898.47 million in investment.

## In the Pennsylvania service territory:



### Load Forecast:

Pennsylvania's summer peak load growth is projected to range between 0.1% and 2.0% annually over the next ten years, while the winter peak is projected to increase by 0.1% to 2.1% percent, depending on the transmission zone.



### Capacity Market:

No Base Residual Auction was conducted in 2023. For the most recent auction results please see the 2022 Pennsylvania Infrastructure Report.



### Market Performance:

Pennsylvania's average hourly LMPs were lower than the PJM average hourly LMP.



### Emissions:

Pennsylvania's average CO<sub>2</sub> emissions decreased in 2023 compared to 2022 levels.

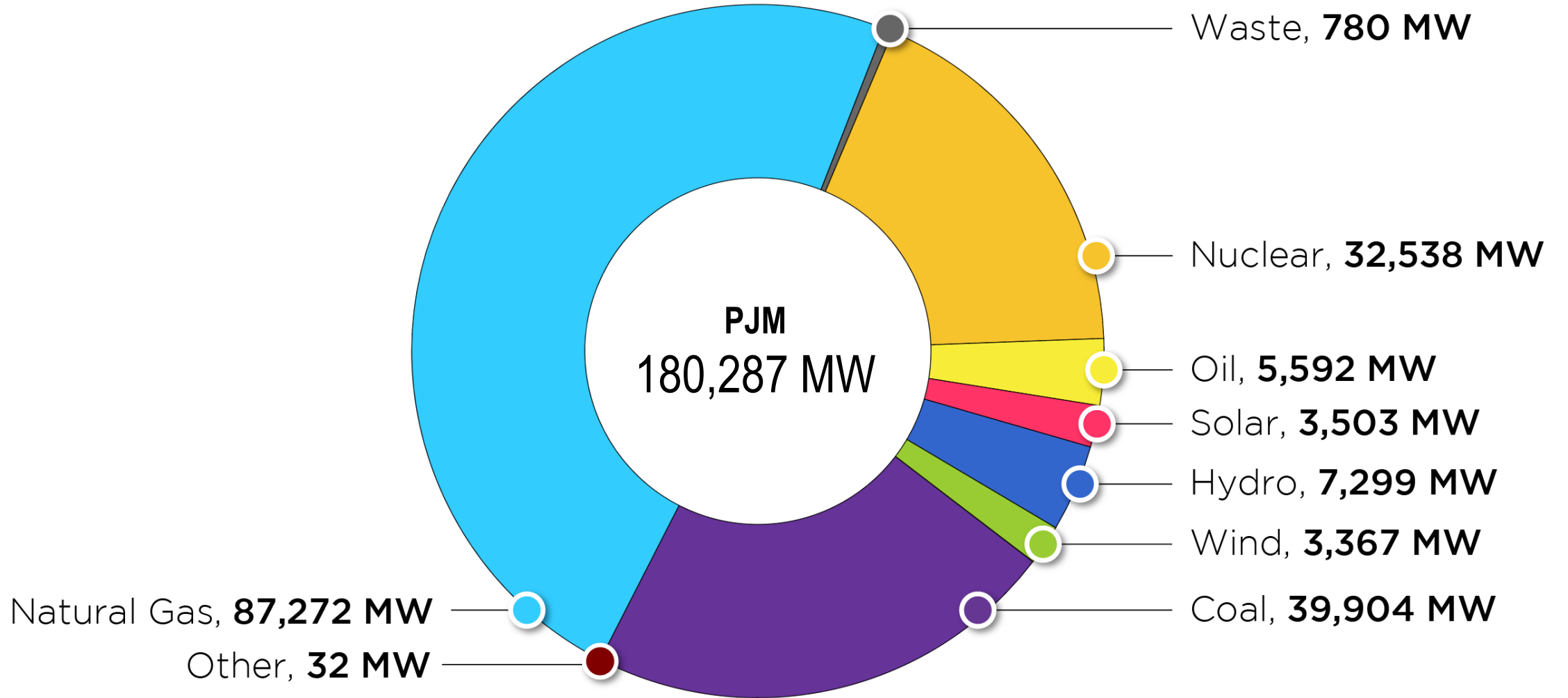


# Planning

## Generation Portfolio Analysis

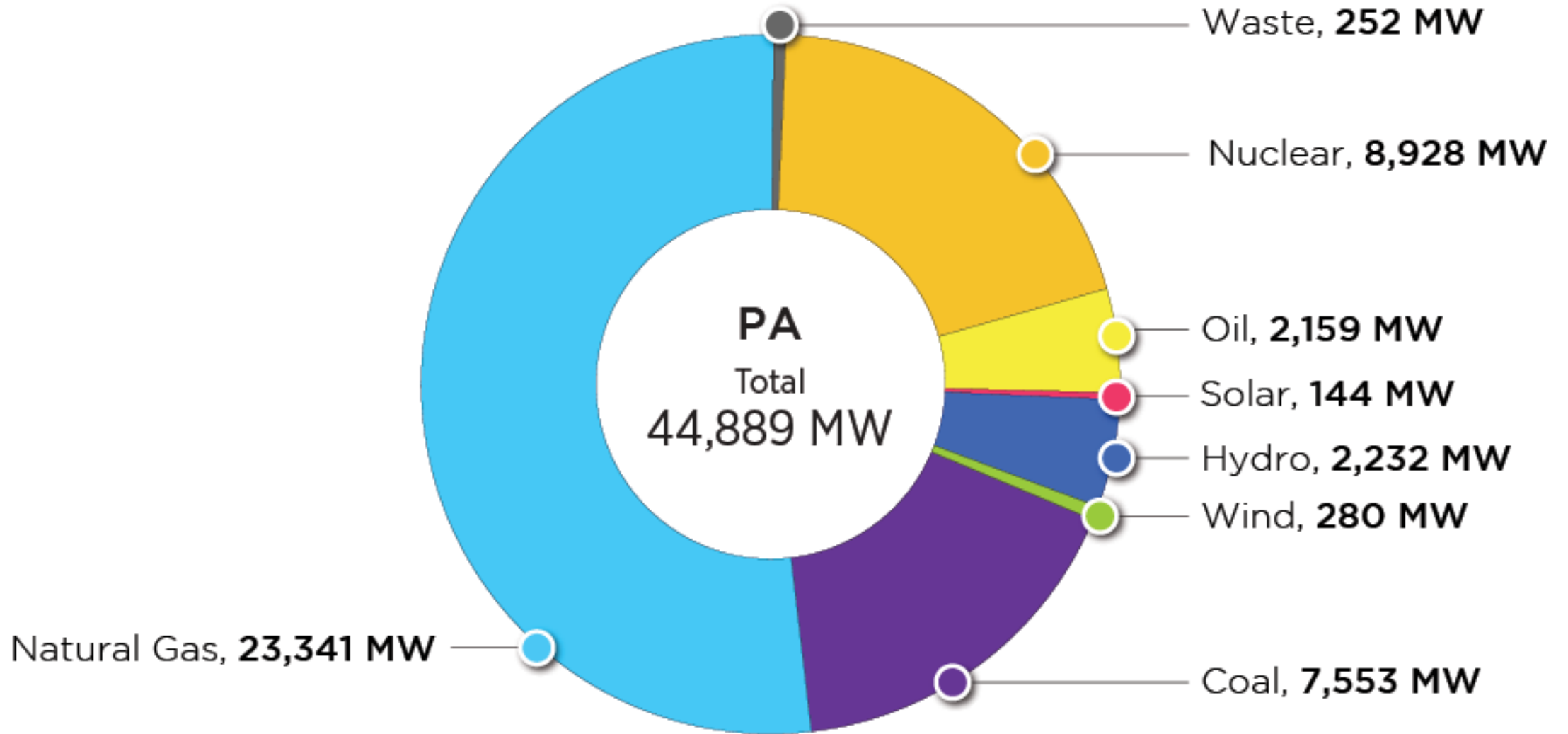
# PJM Existing Installed Capacity Mix

(CIRs – as of Dec. 31, 2023)



# Pennsylvania – Existing Installed Capacity (MW) by Fuel Type

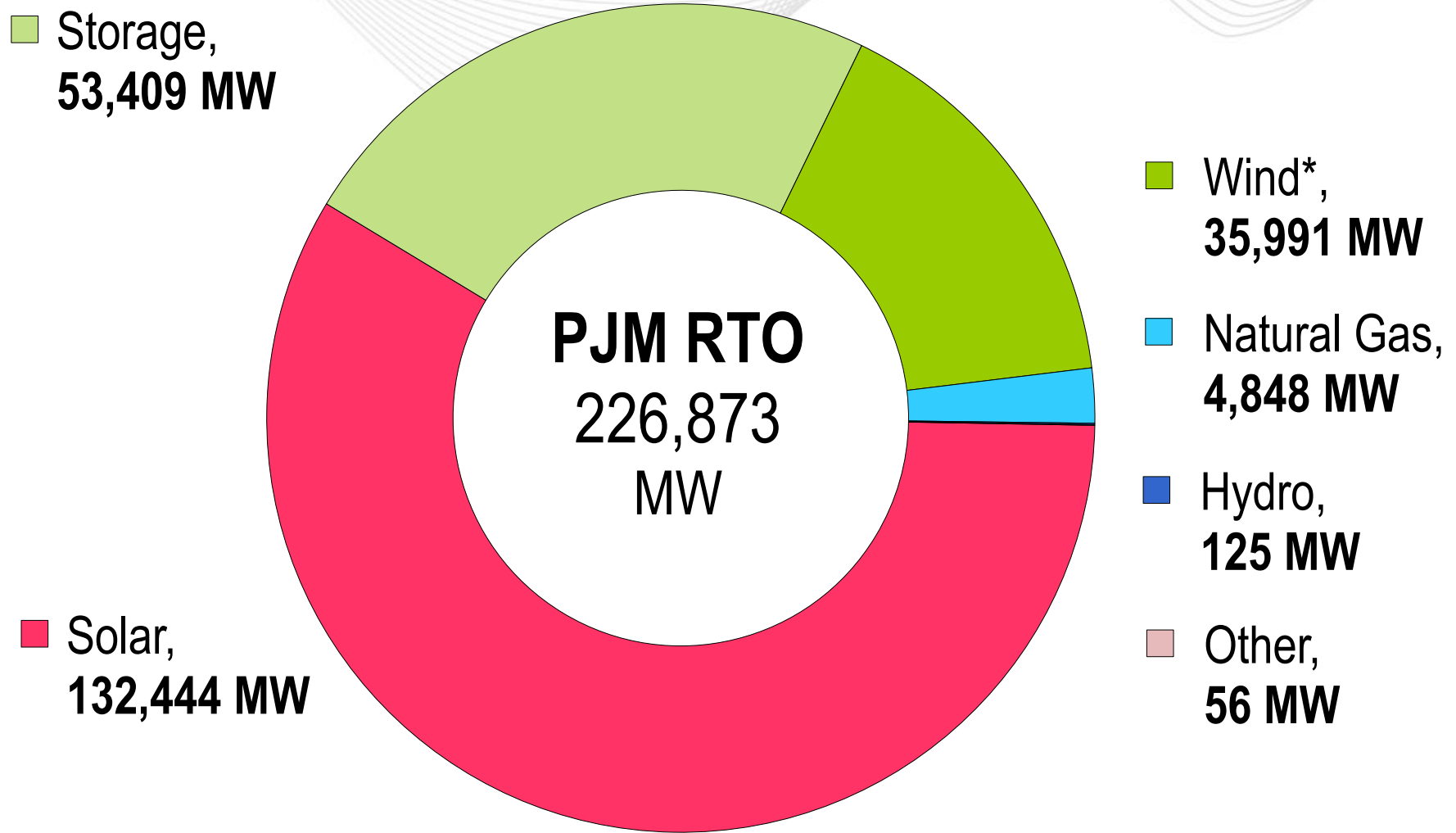
(as of Dec. 31, 2023)





# PJM Queued Capacity (Nameplate) by Fuel Type

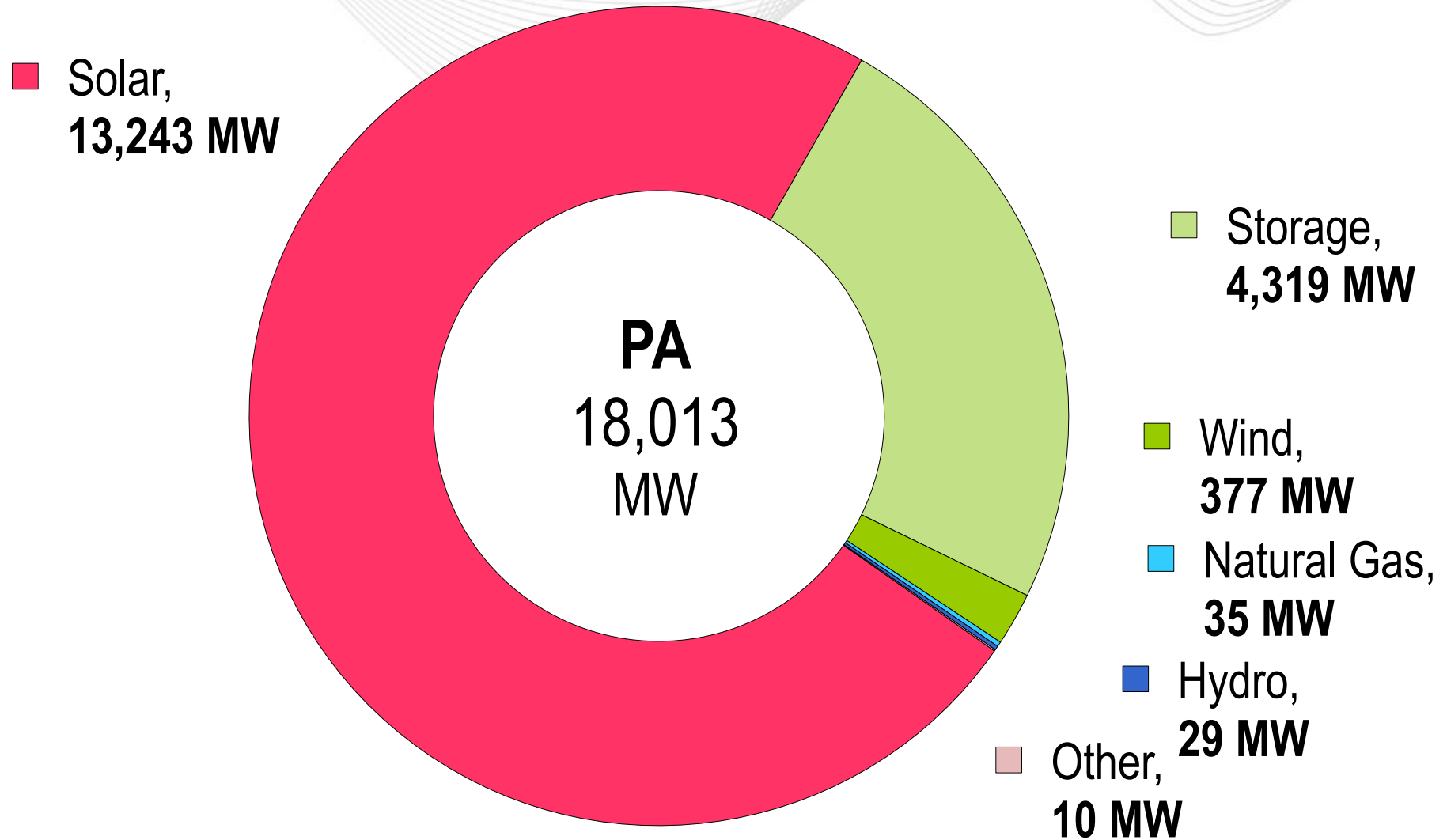
("Active" in the PJM Queue as of April 1, 2024)

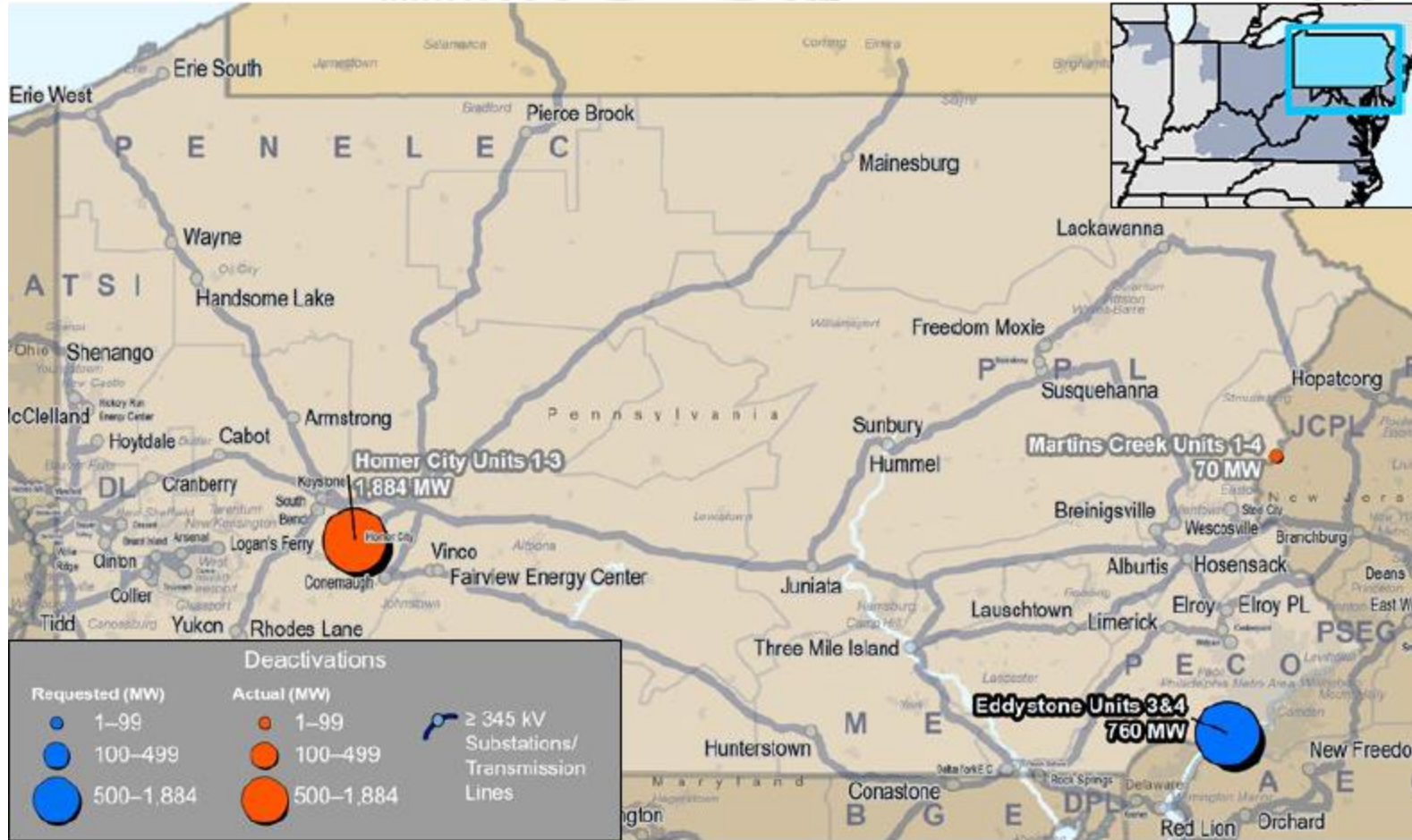


\*Wind includes both onshore and offshore wind

# Pennsylvania Queued Capacity (Nameplate) by Fuel Type

("Active" in the PJM Queue as of April 1, 2024)







# Pennsylvania – 2023 Generator Deactivations

Unit	TO Zone	Fuel Type	Request Received to Deactivate	Actual or Projected Deactivation Date	Age (Years)	Capacity (MW)	
EDDYSTONE 4	PECO	Oil	12/1/23	5/31/2025	53	380	
EDDYSTONE 3						380	
HOMER CITY 3	PENELEC	Coal	3/31/23	7/1/2023	46	650	
HOMER CITY 2						54	614
HOMER CITY 1						620	
Martins Creek CT 1	PPL	Oil	2/10/2022	6/1/2023	50	18	
Martins Creek CT 2						17.3	
Martins Creek CT 4						PPL	Natural Gas

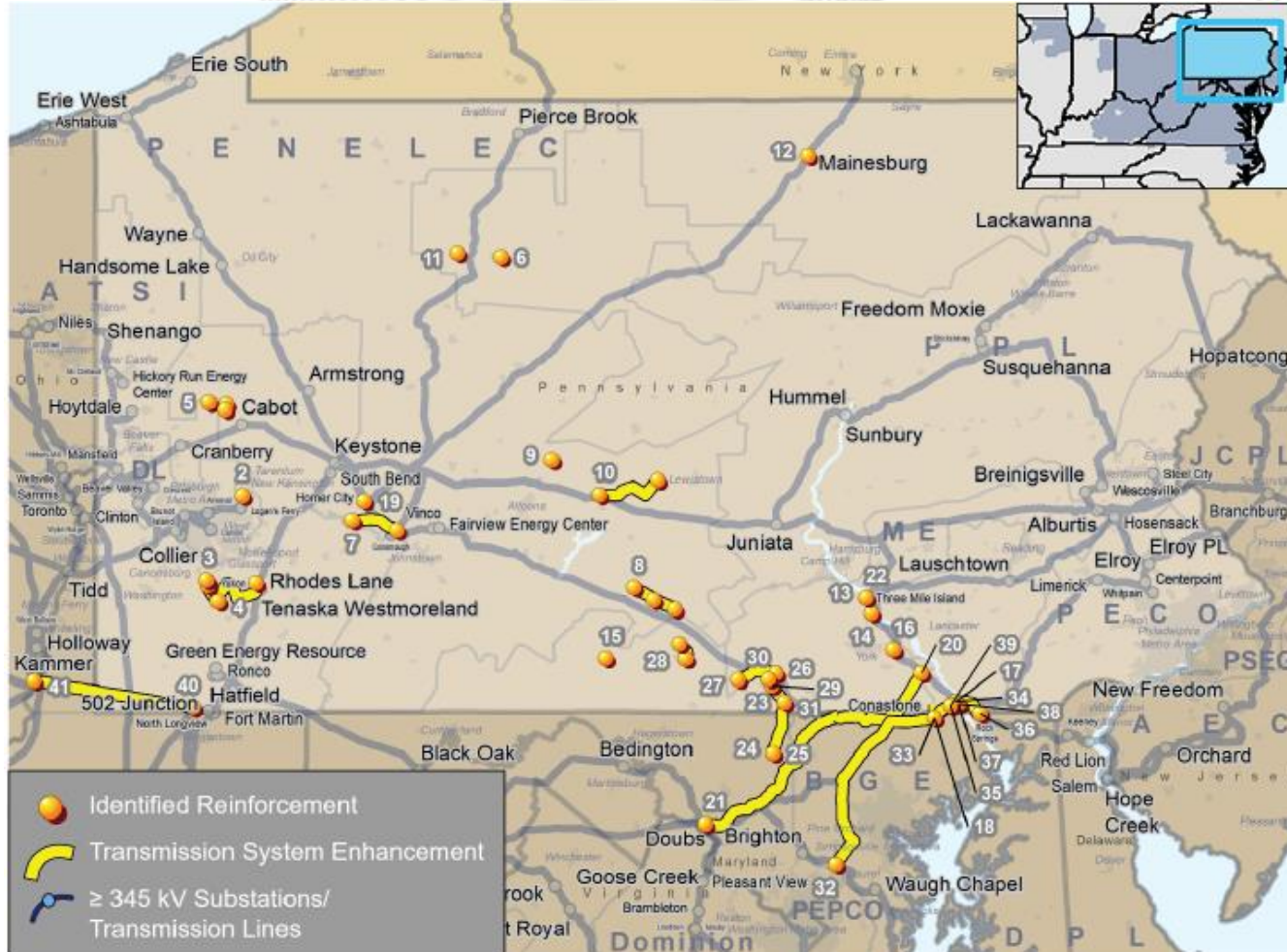
# Planning

## Transmission Infrastructure Analysis

For reporting purposes, the 2023 state infrastructure reports provide maps displaying all baseline, network, and supplemental projects for the respective state. The reports also include aggregated project costs for each type of project within each state. The costs listed in the state infrastructure reports and 2023 Annual RTEP Report are not indicative of each project's cost allocation.

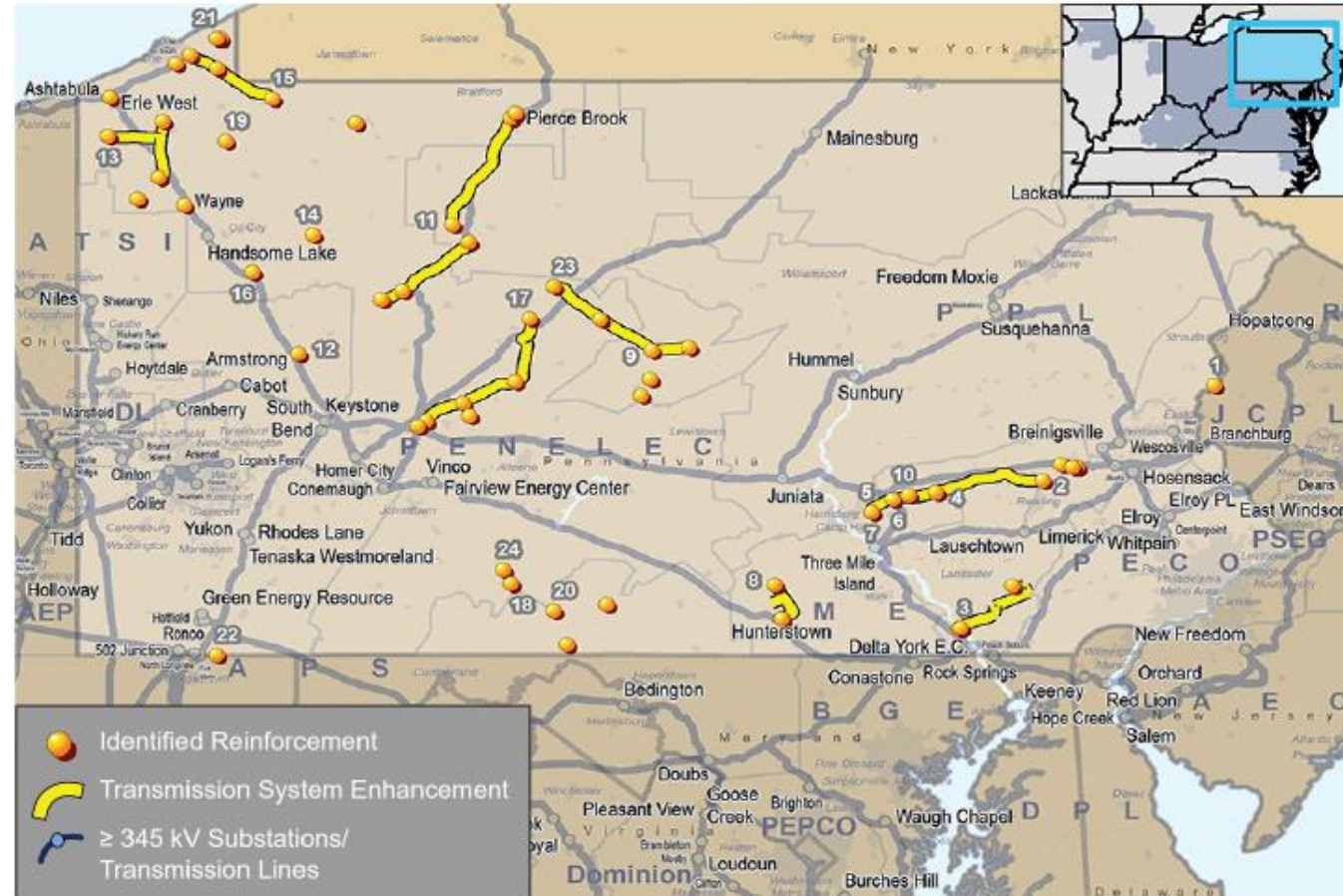
For a detailed list of each project shown on a state's project map, please see that state's section in the **2023 Annual RTEP Report** on PJM.com: <https://pjm.com/-/media/library/reports-notices/2023-rtep/2023-rtep-report.ashx>.

The complete list of all RTEP projects in PJM, including those from prior years, can be found at the **RTEP Upgrades & Status – Transmission Construction Status** page on PJM.com: <https://www.pjm.com/planning/m/project-construction>.



The 2023 RTEP has \$501.68 million in baseline projects located in Pennsylvania.

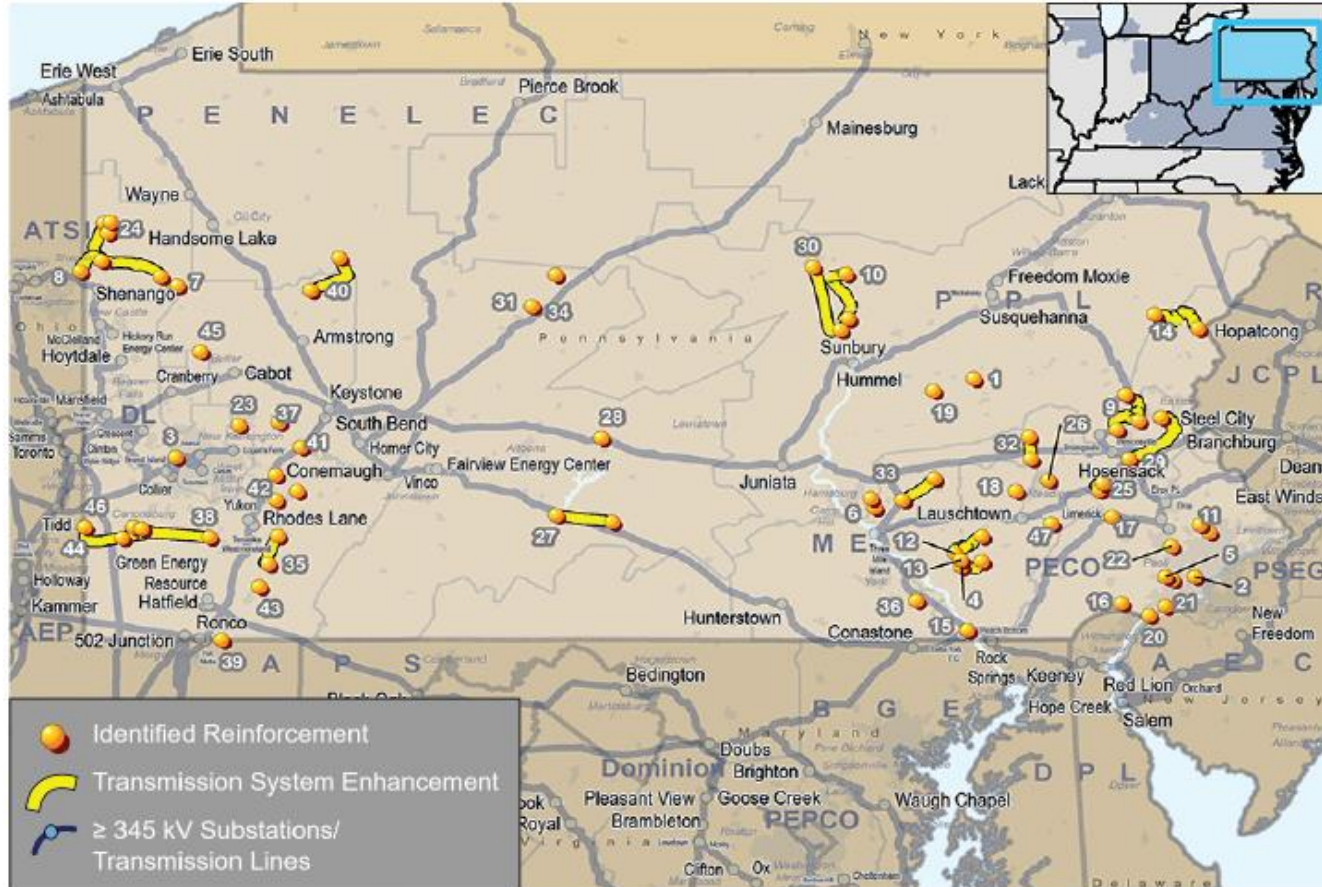
Note: Baseline upgrades are those that resolve a system reliability criteria violation. Baseline projects listed in the annual RTEP report reflect project costs within a specific location and are not indicative of the project's cost allocation.



The 2023 RTEP has \$75.13 million in network upgrades located in Pennsylvania.

Note: Network projects are new or upgraded facilities required primarily to eliminate reliability criteria violations caused by proposed generation, merchant transmission or long-term firm transmission service requests, as well as certain direct connection facilities required to interconnect proposed generation projects. The costs of network projects are borne by the interconnection customer.





The 2023 RTEP has \$321.66 million in supplemental projects located in Pennsylvania.

Note: Supplemental projects are transmission expansions or enhancements that are not required for compliance with PJM criteria and are not state public policy projects according to the PJM Operating Agreement. These projects are used as inputs to RTEP models, but are not required for reliability, economic efficiency or operational performance criteria, as determined by PJM.

# Planning Load Forecast



# PJM Electricity Demand Growth

Load (MW)

195,000

185,000

175,000

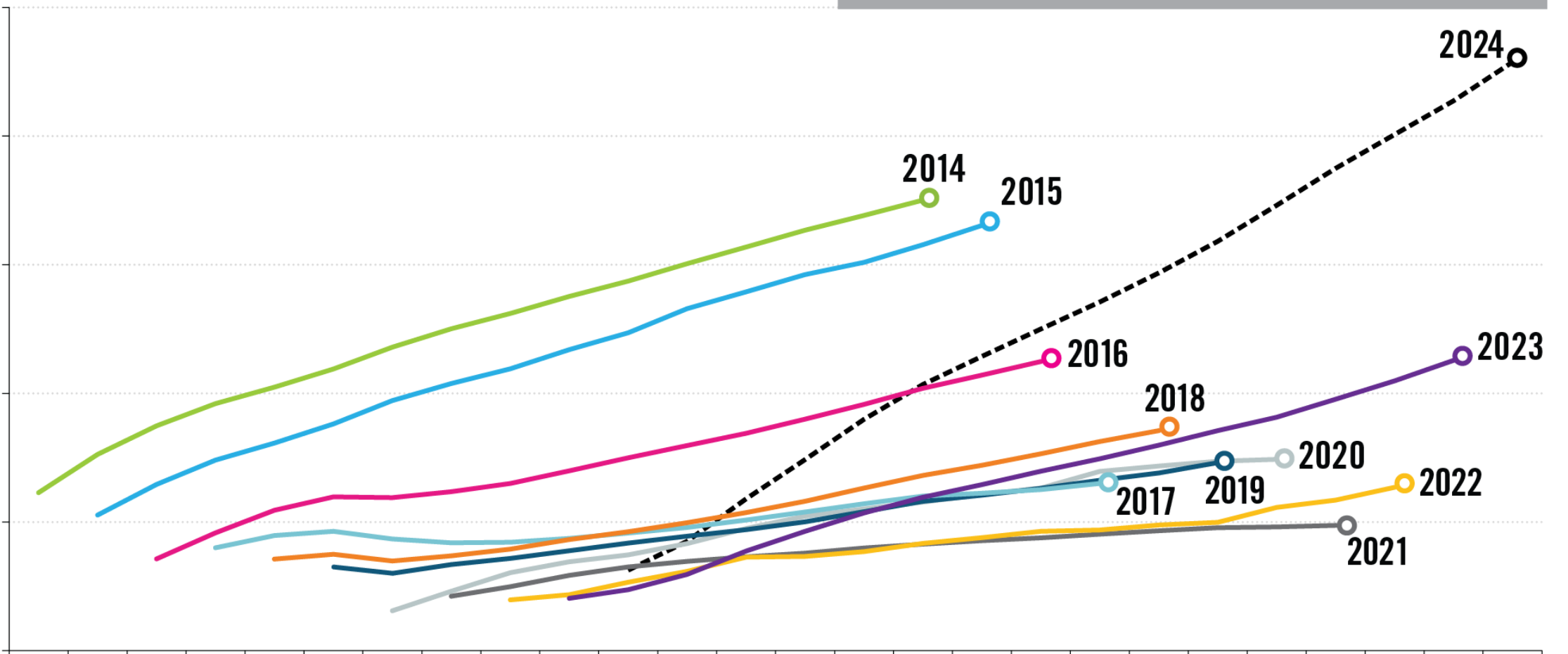
165,000

155,000

145,000

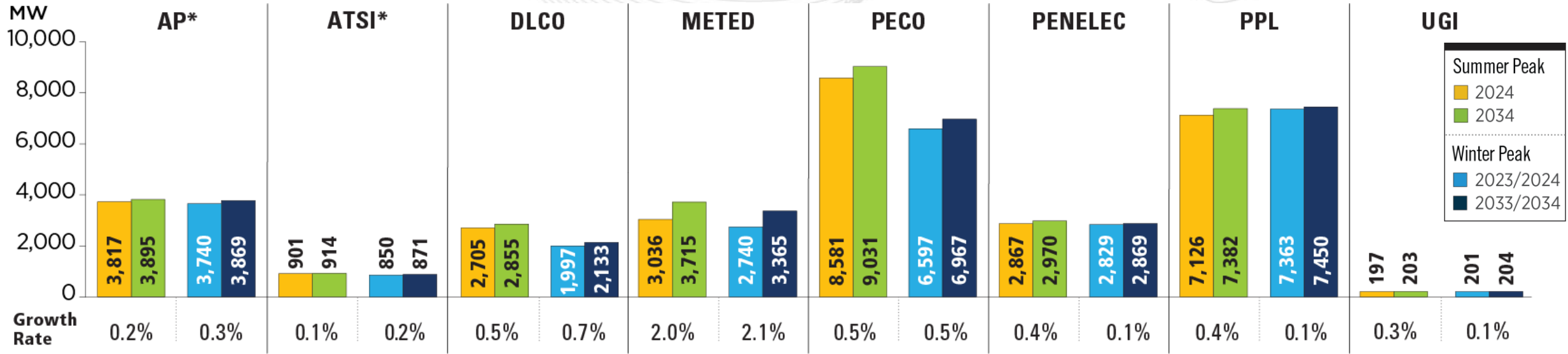
PJM RTO Summer Peak Demand Forecast

2015 2017 2019 2021 2023 2025 2027 2029 2031 2033 2035 2037 2039





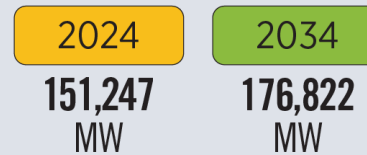
# Pennsylvania – 2024 Load Forecast Report



\*Serves load outside PA

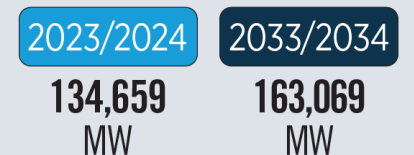
The summer and winter peak megawatt values reflect the estimated amount of forecast load to be served by each transmission owner in the noted state/district. Estimated amounts were calculated based on the average share of each transmission owner's real-time summer and winter peak load in those areas over the past five years.

### PJM RTO Summer Peak



Growth Rate 1.6%

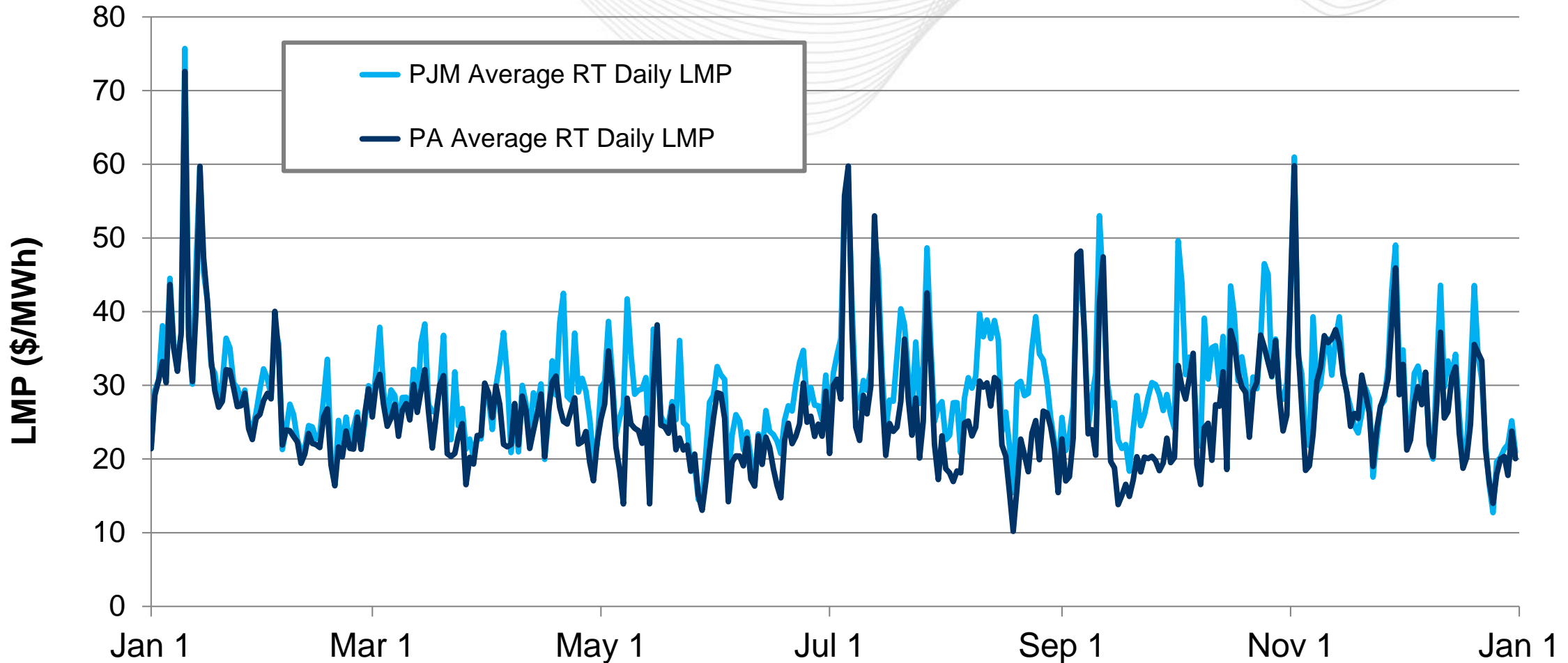
### PJM RTO Winter Peak



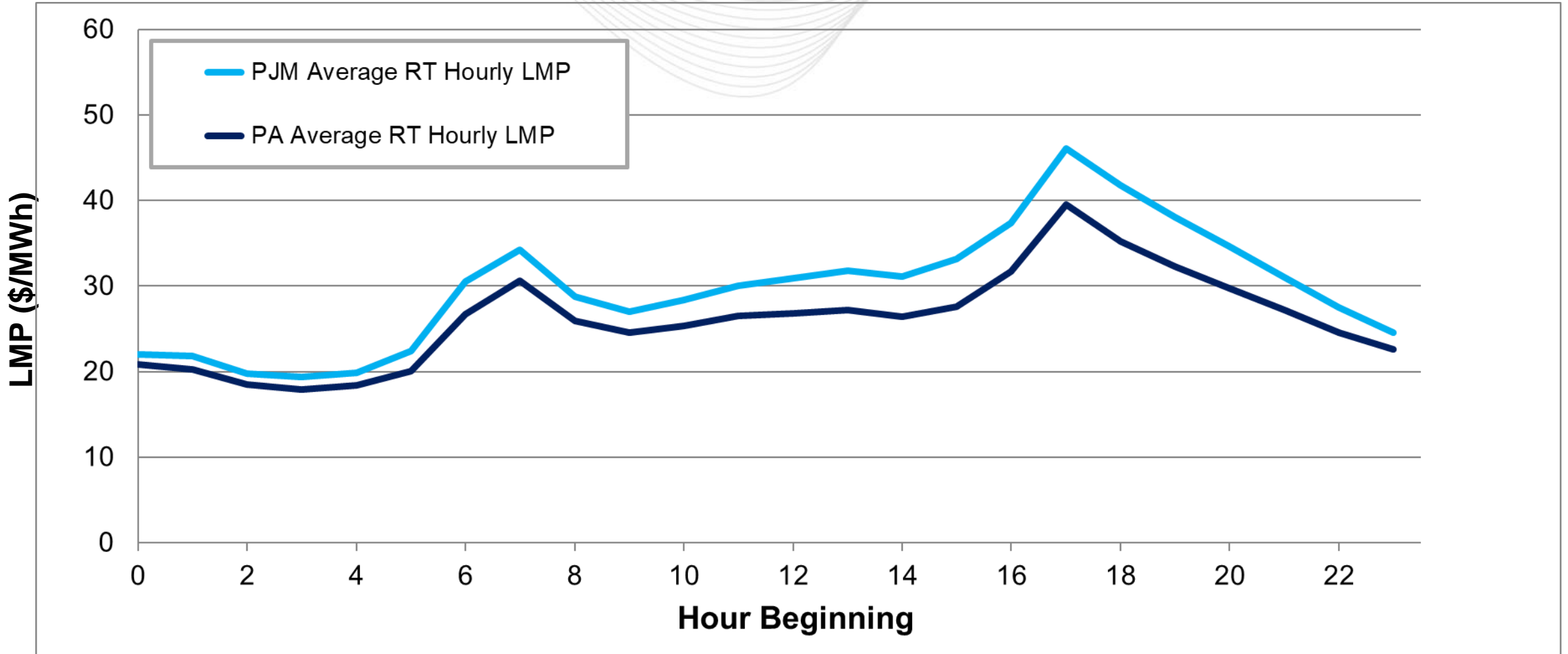
Growth Rate 1.9%

# Markets

## Market Analysis



Pennsylvania's average hourly LMPs were lower than the PJM average hourly LMP.

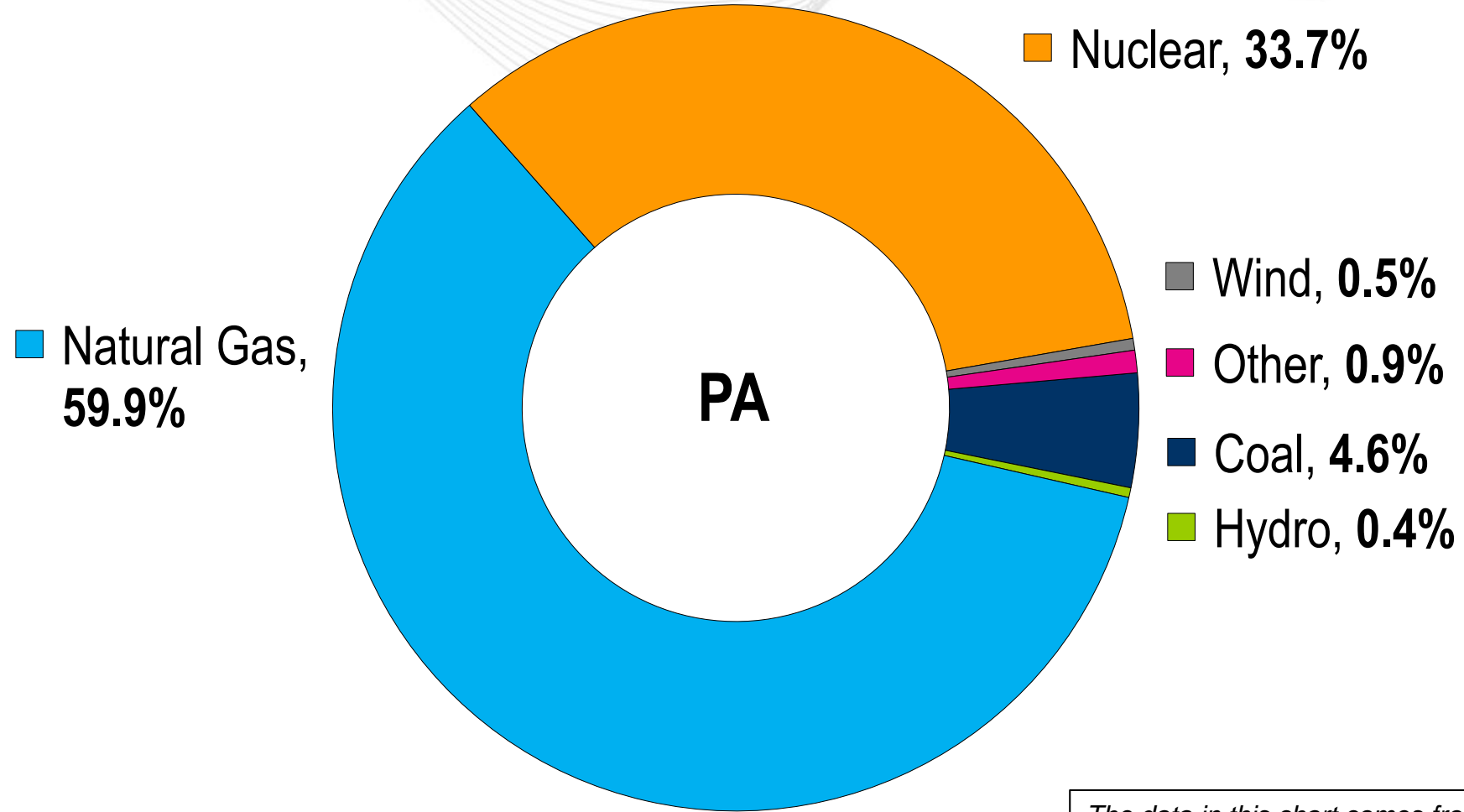




Positive values represent exports and negative values represent imports.



# Operations



The data in this chart comes from EIA Form 923 (2023).

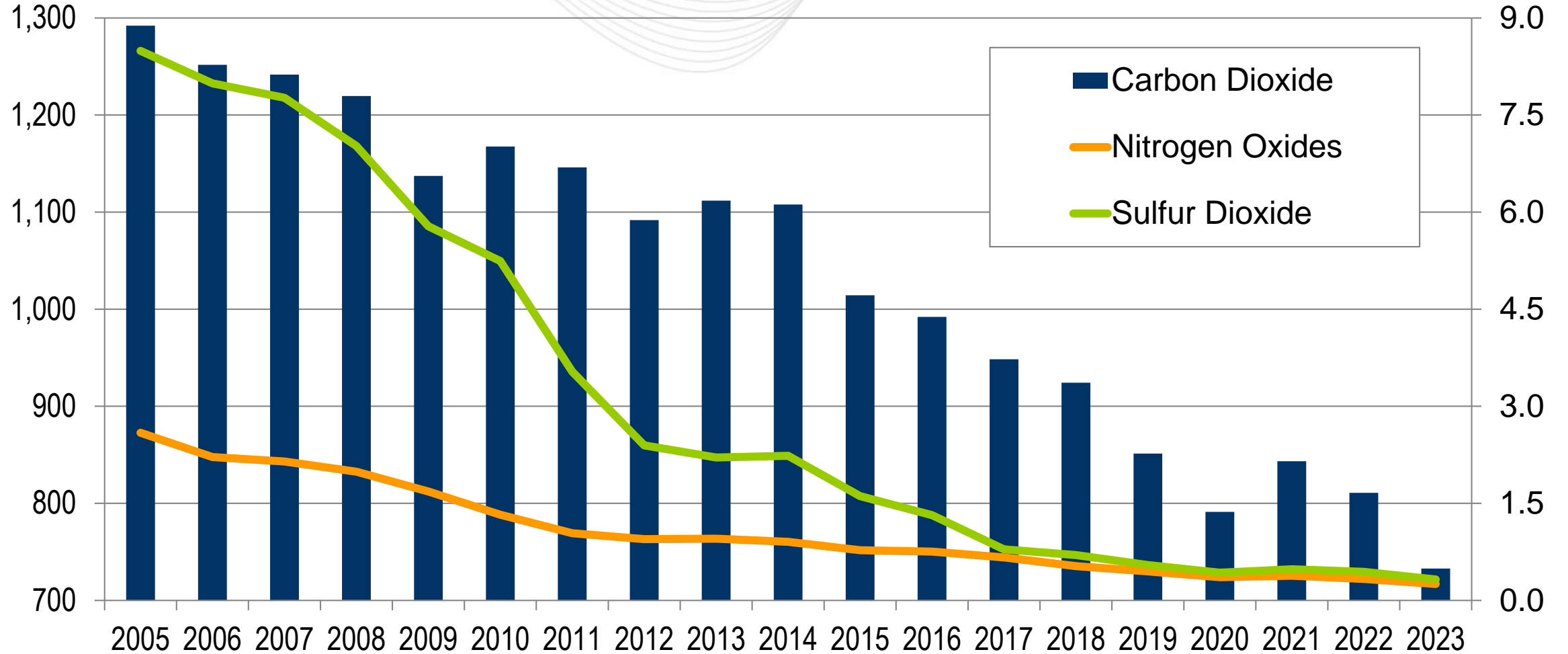


# 2005–2023 PJM Average Emissions

(March 2024)

**CO<sub>2</sub>**  
(lbs/MWh)

**SO<sub>2</sub> and NO<sub>x</sub>**  
(lbs/MWh)





# Pennsylvania – Average Emissions (lbs/MWh)

(March 2024)

**CO<sub>2</sub>**  
(lbs/MWh)

**SO<sub>2</sub> and NO<sub>x</sub>**  
(lbs/MWh)

