



2022 Ohio State Infrastructure Report

(January 1, 2022 – December 31, 2022)

May 2023

1. Planning

- Generation Portfolio Analysis
- Transmission Analysis
- Load Forecast

2. Markets

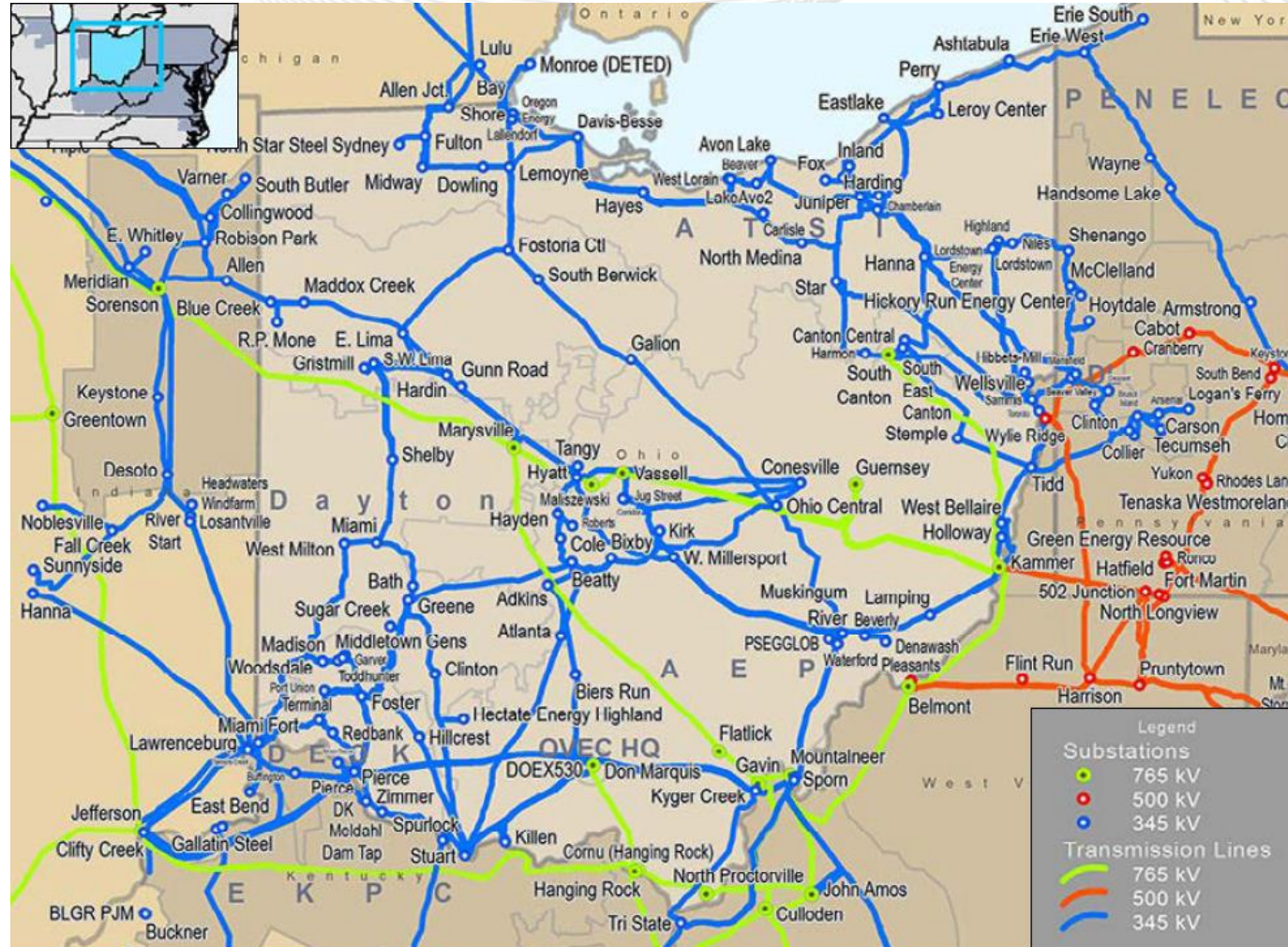
- Capacity Market Results
- Market Analysis
- Net Energy Import/Export Trend

3. Operations

- Generator Production
- Emissions Data

- **Existing Capacity:** Natural gas represents approximately 53.9 percent of the total installed capacity in Ohio while coal represents approximately 33.4 percent. Comparatively, in PJM natural gas and coal are 46.6 and 24.0 percent of total installed capacity.
- **Interconnection Requests:** Solar represents 76.9 percent of new interconnection requests in Ohio, while storage represents approximately 18.8 percent of new requests.
- **Deactivations:** 1,989 MW of generation deactivated and 1,518.3 MW gave a notice of deactivation in Ohio during 2022.
- **RTEP 2022:** Ohio's 2022 RTEP project total represents approximately \$761.97 million in investment.

- **Load Forecast:** Ohio's summer peak load is projected to grow between -0.3 and 0.1 percent annually over the next ten years, depending on the service territory. Comparatively, the overall PJM RTO projected summer peak load growth rate is 0.8 percent.
- **2023/24 Capacity Market:** Ohio's service territory cleared at the RTO price of \$34.13/MW-day for the 2023/2024 Base Residual Auction.
- **2024/25 Capacity Market:** Ohio's service territory cleared at the RTO price of \$28.92/MW-day and at \$96.24 within DEO&K for the 2024/2025 Base Residual Auction
- **1/1/22 – 12/31/22 Market Performance:** Ohio's average hourly LMPs generally aligned with the PJM average hourly LMP.
- **Emissions:** Ohio's average CO2 emissions decreased in 2022 compared to 2021 levels.

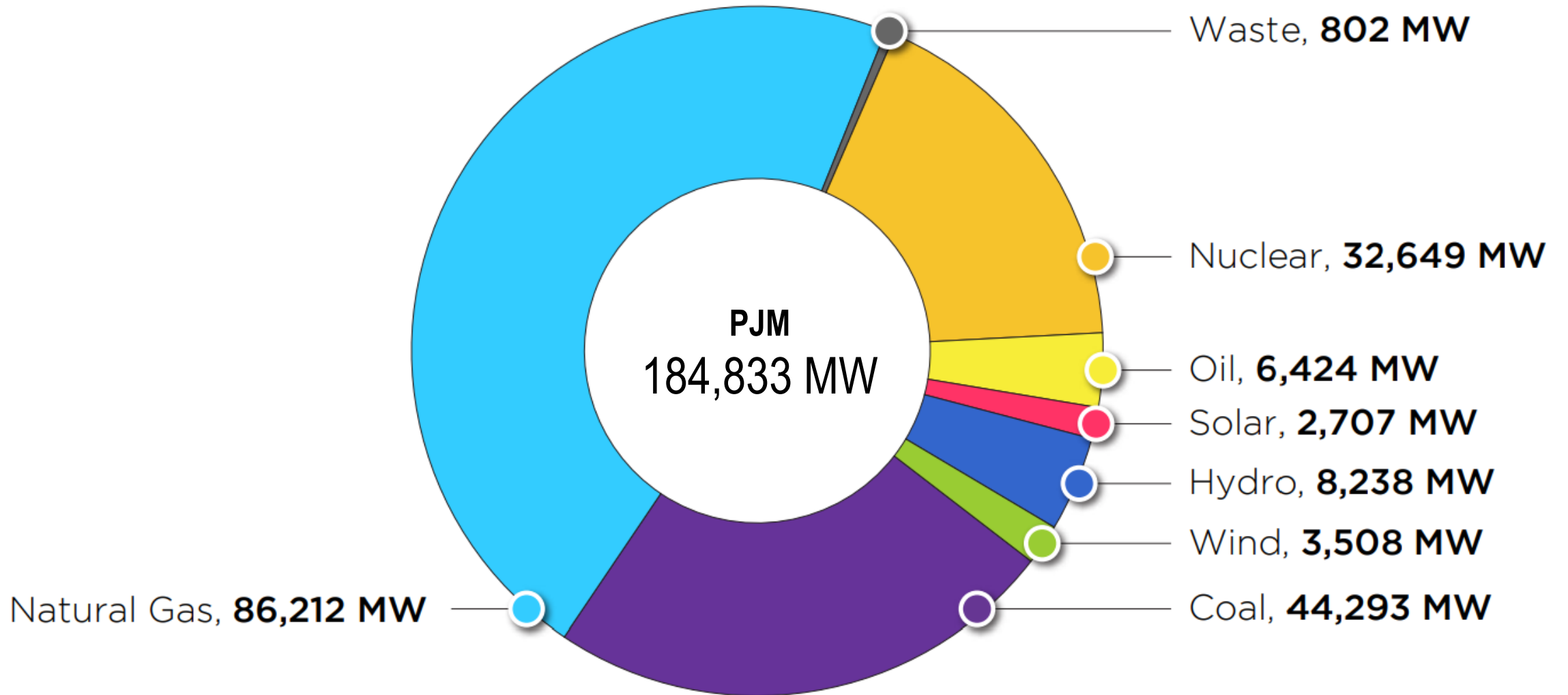


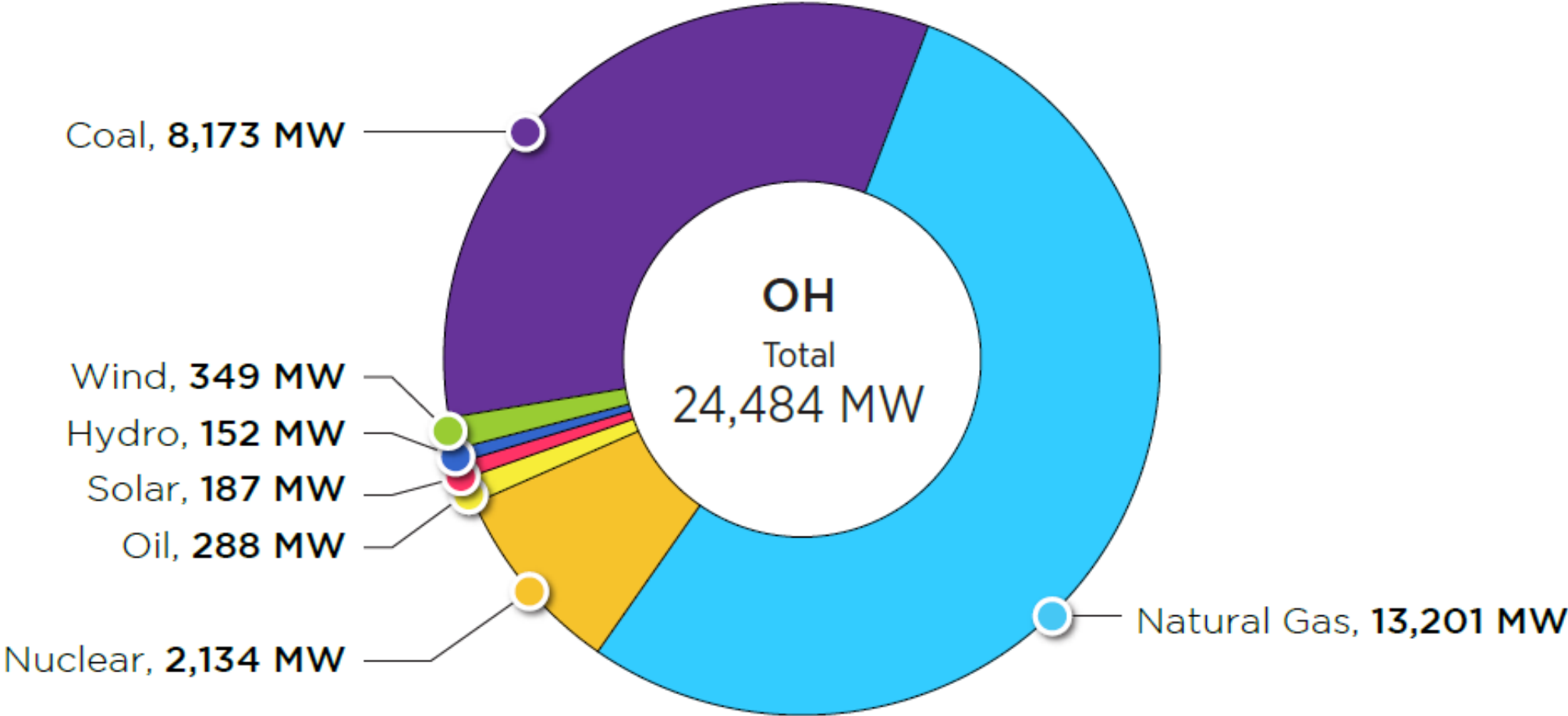
Planning

Generation Portfolio Analysis

PJM – Existing Installed Capacity

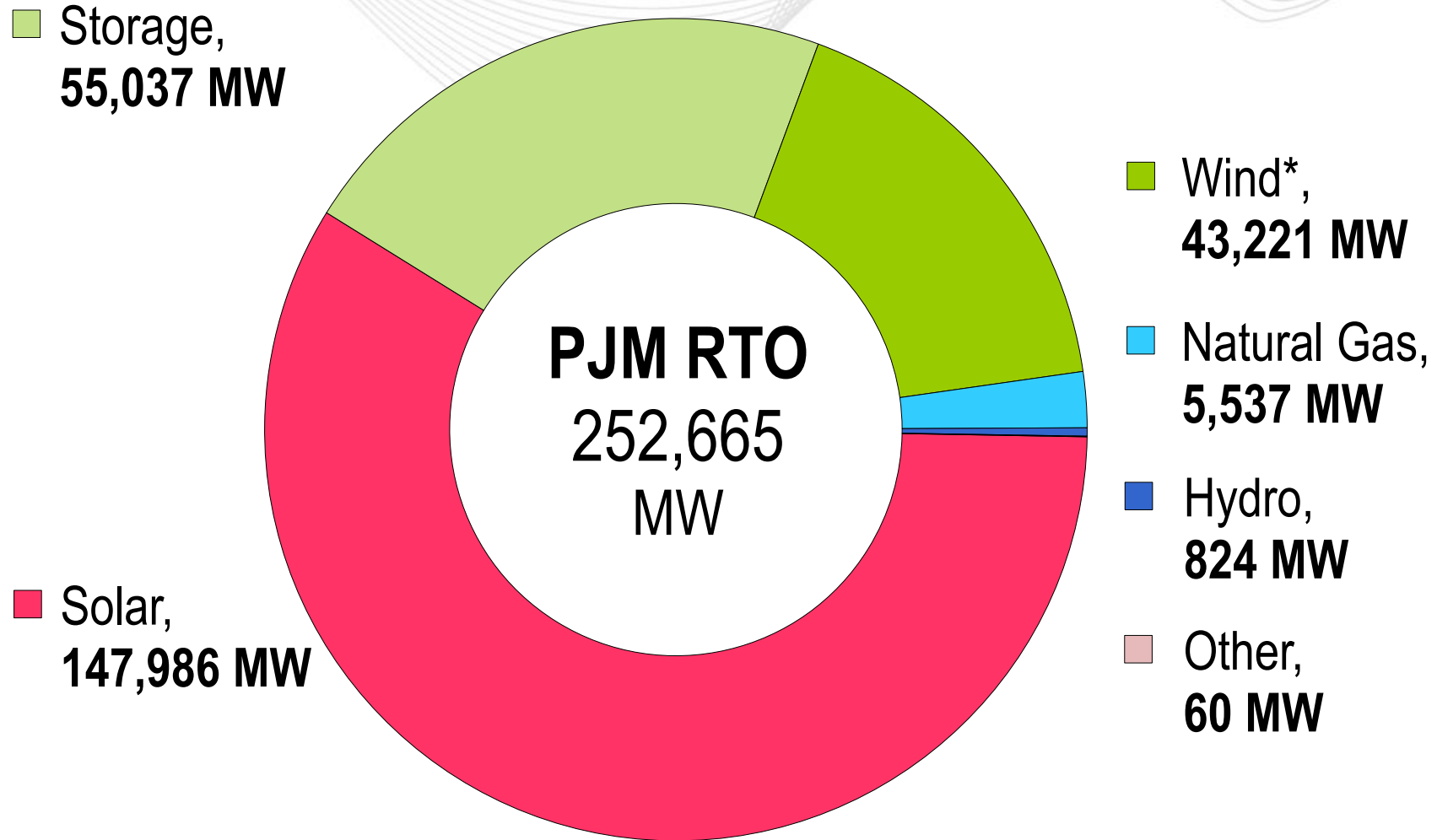
(CIRs – as of Dec. 31, 2022)





PJM Queued Capacity (Nameplate) by Fuel Type

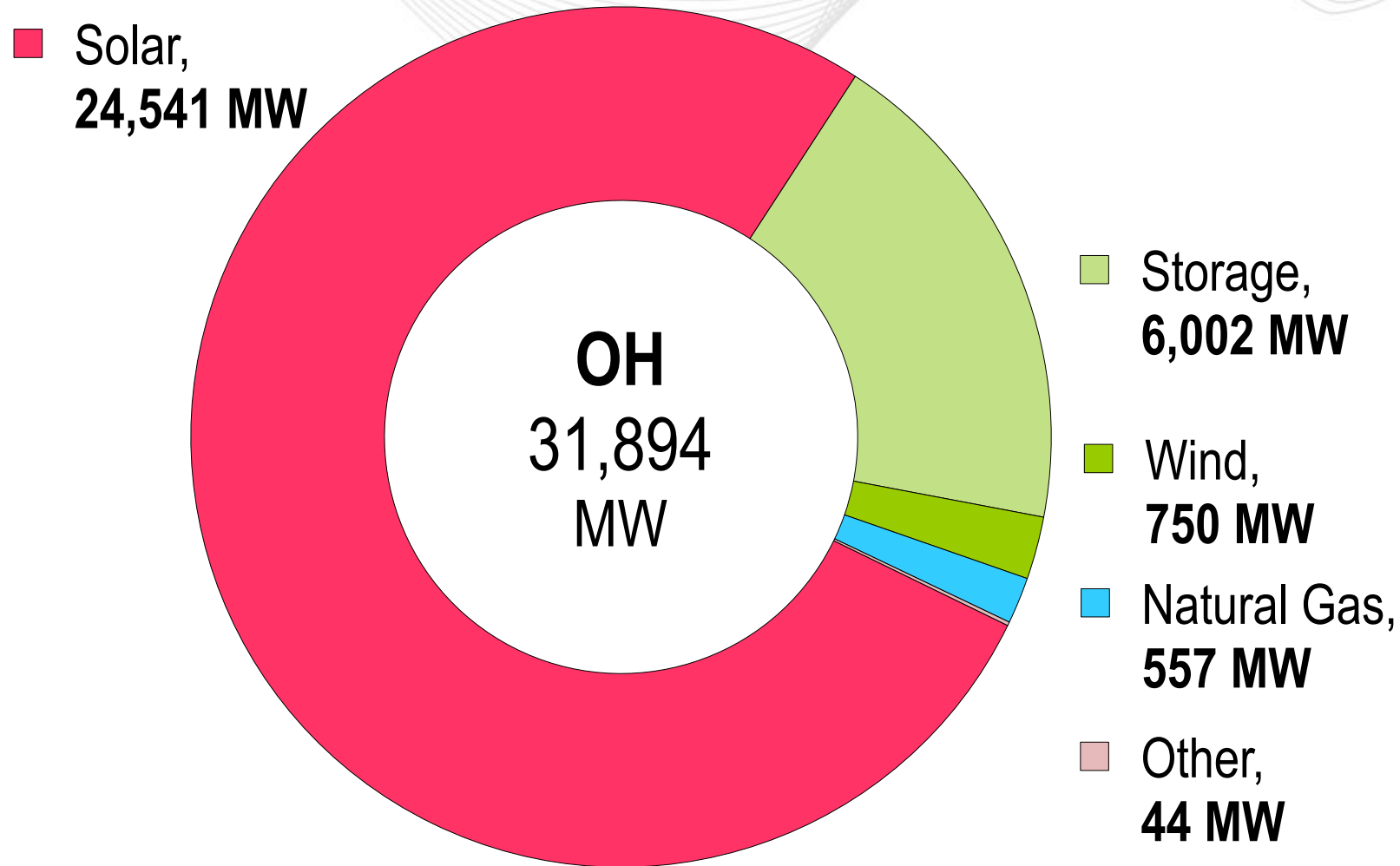
("Active" in the PJM Queue as of April 1, 2023)



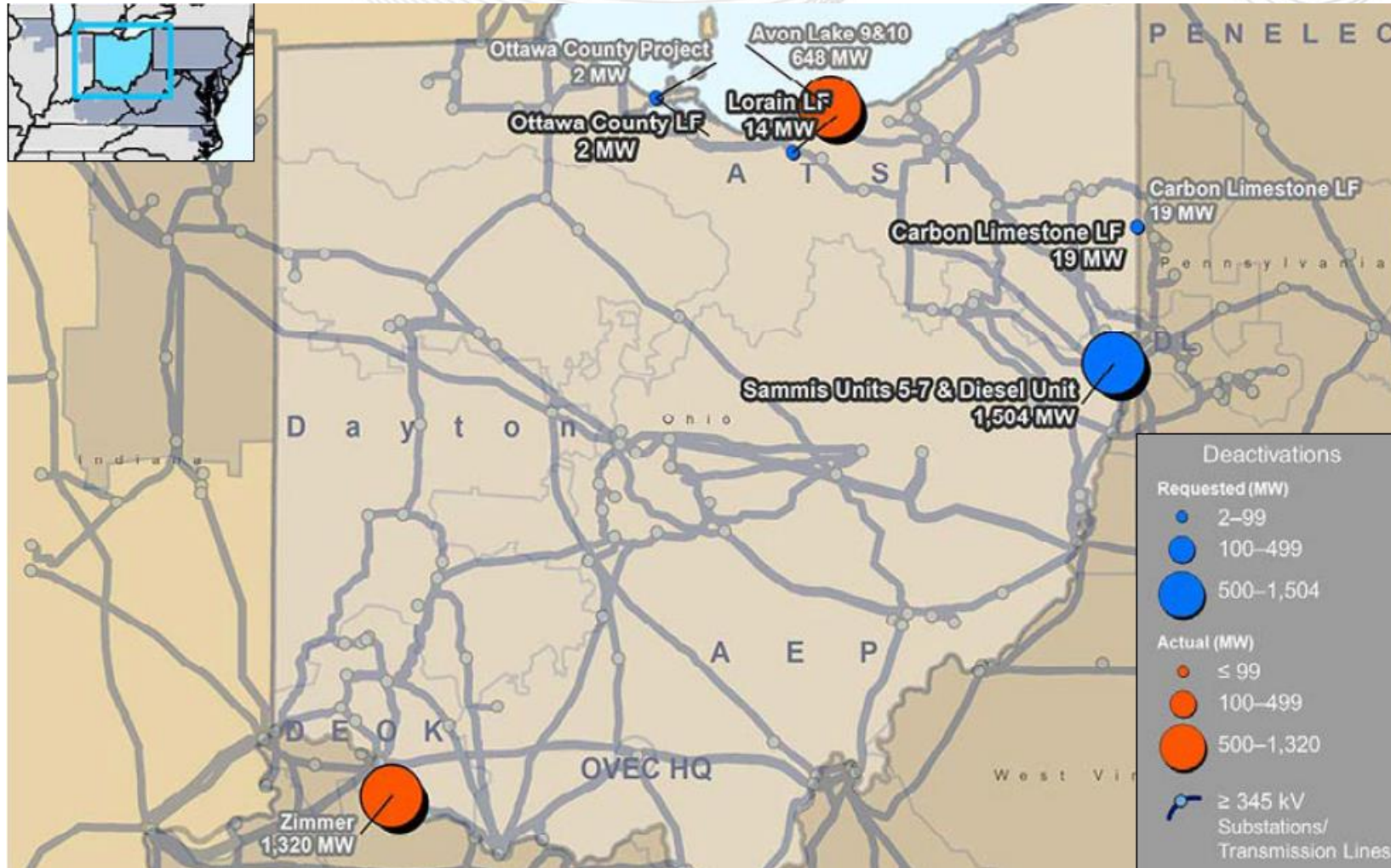
*Wind includes both onshore and offshore wind

Ohio Queued Capacity (Nameplate) by Fuel Type

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



Ohio – 2022 Generator Deactivations





Ohio – 2022 Generator Deactivations

Unit	TO Zone	Fuel Type	Request Received to Deactivate	Actual or Projected Deactivation Date	Age (Years)	Capacity (MW)
Lorain 1 LF	ATSI	Methane	10/14/2022	4/1/2023	21	14.0
Sammis Diesel Units		Coal	3/14/2022	6/1/2023	50	13.0
Sammis Unit 7					51	600.0
Sammis Unit 6					53	600.0
Sammis Unit 5					55	291.3
Carbon Limestone LF		Methane	5/2/2022	11/15/2022	21	19.3
Ottawa County Project			2/18/2022	5/31/2022	21	1.7
Zimmer 1	DEO&K	Coal	7/19/2021	5/31/2022	30	1,320.0
Avon Lake 9	ATSI		7/14/2021	3/31/2022	51	627.0
Avon Lake 10		Oil	7/14/2021	3/31/2022	53	21.0

Planning

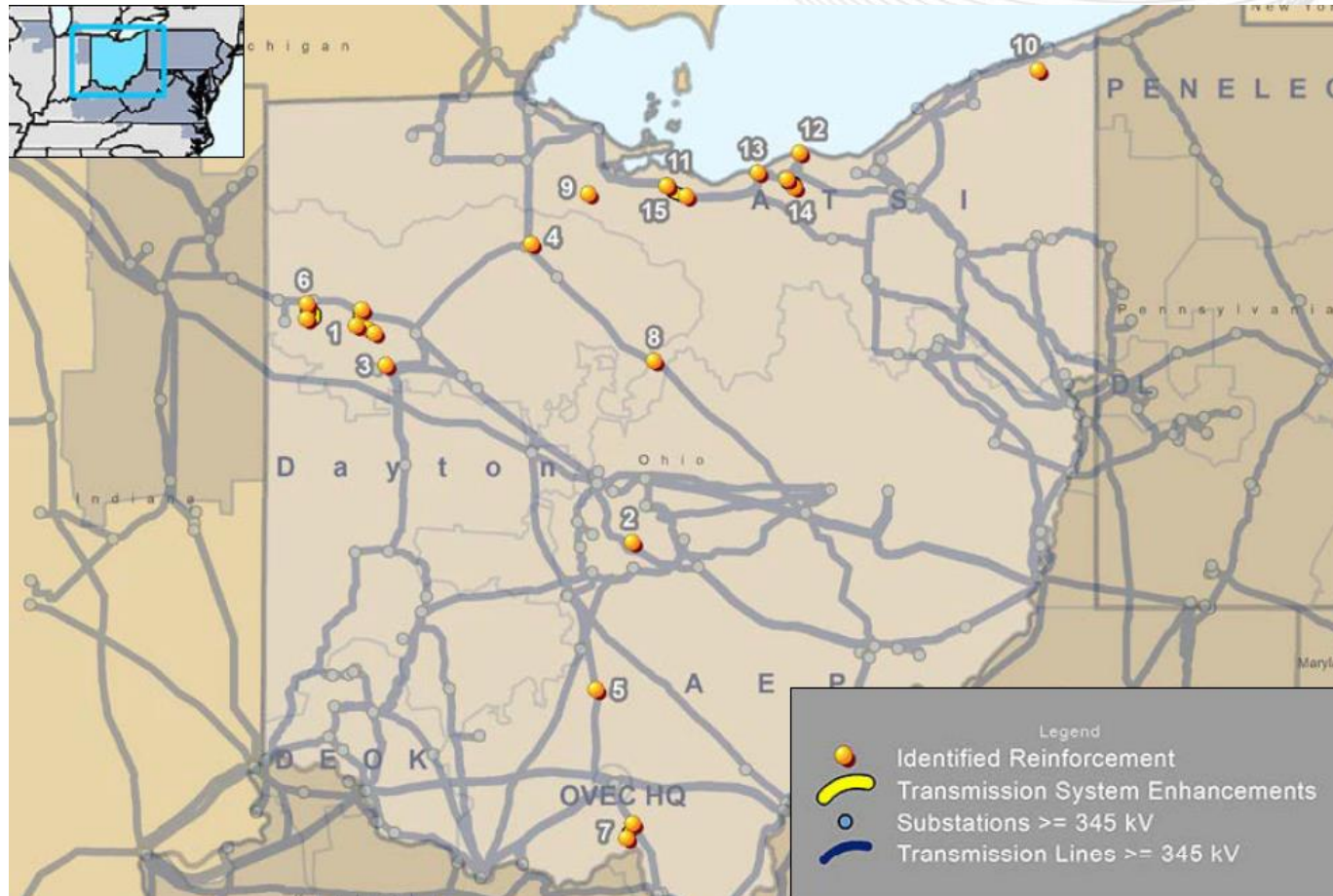
Transmission Infrastructure Analysis

For reporting purposes, the 2022 state infrastructure reports provide maps displaying all baseline, network, and supplemental projects for the respective state. The reports also include aggregated project cost tables of these projects by Transmission Owner zone. For a detailed list of each project shown on a state's project map, please see that state's section in the **2022 Annual RTEP Report** on pjm.com:

<https://www.pjm.com/-/media/library/reports-notices/2022-rtep/2022-rtep-report.ashx>

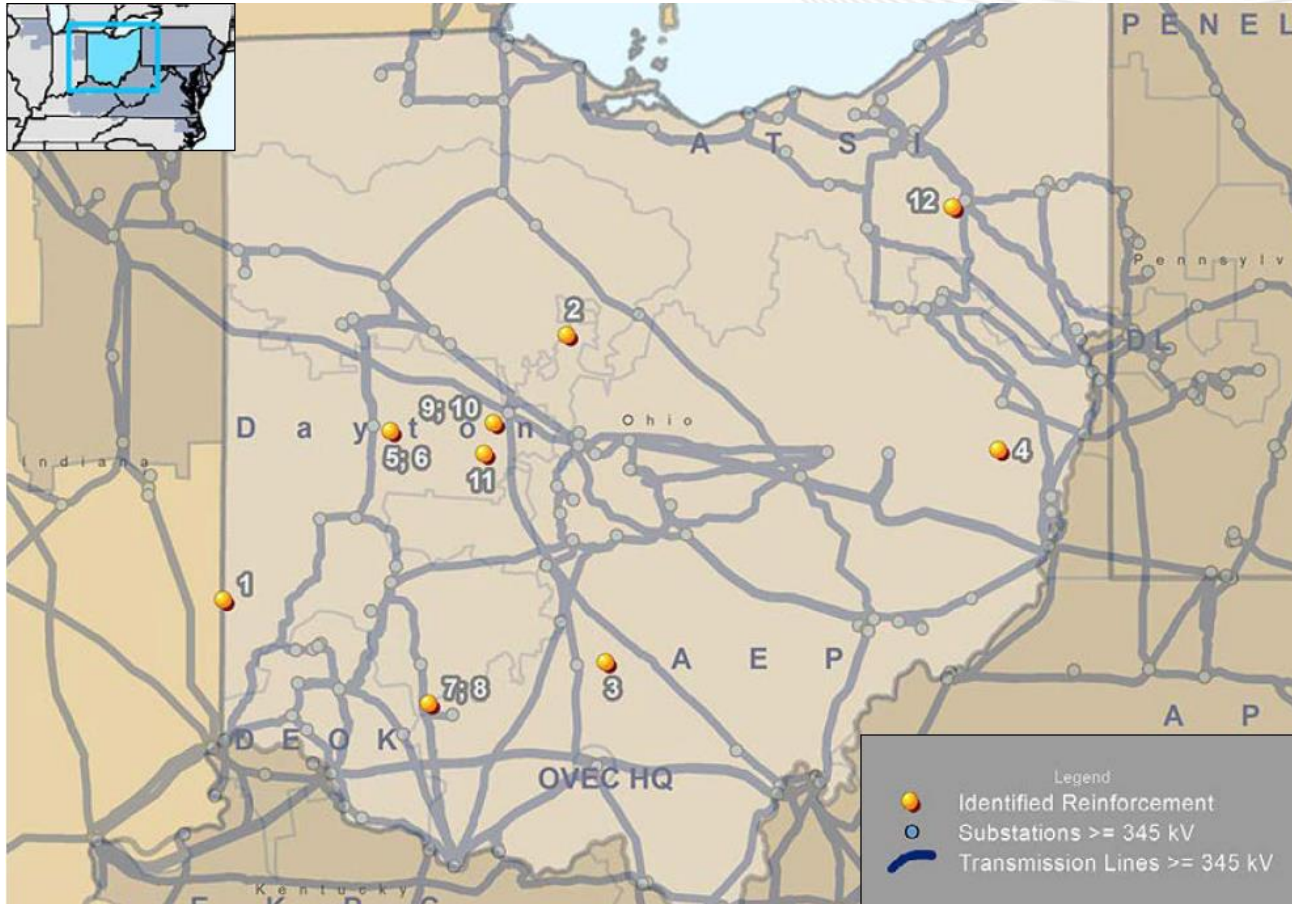
The complete list of all RTEP projects in PJM, including those from prior years, can be found at the **RTEP Upgrades & Status – Transmission Construction Status** page on pjm.com:

<https://www.pjm.com/planning/project-construction>



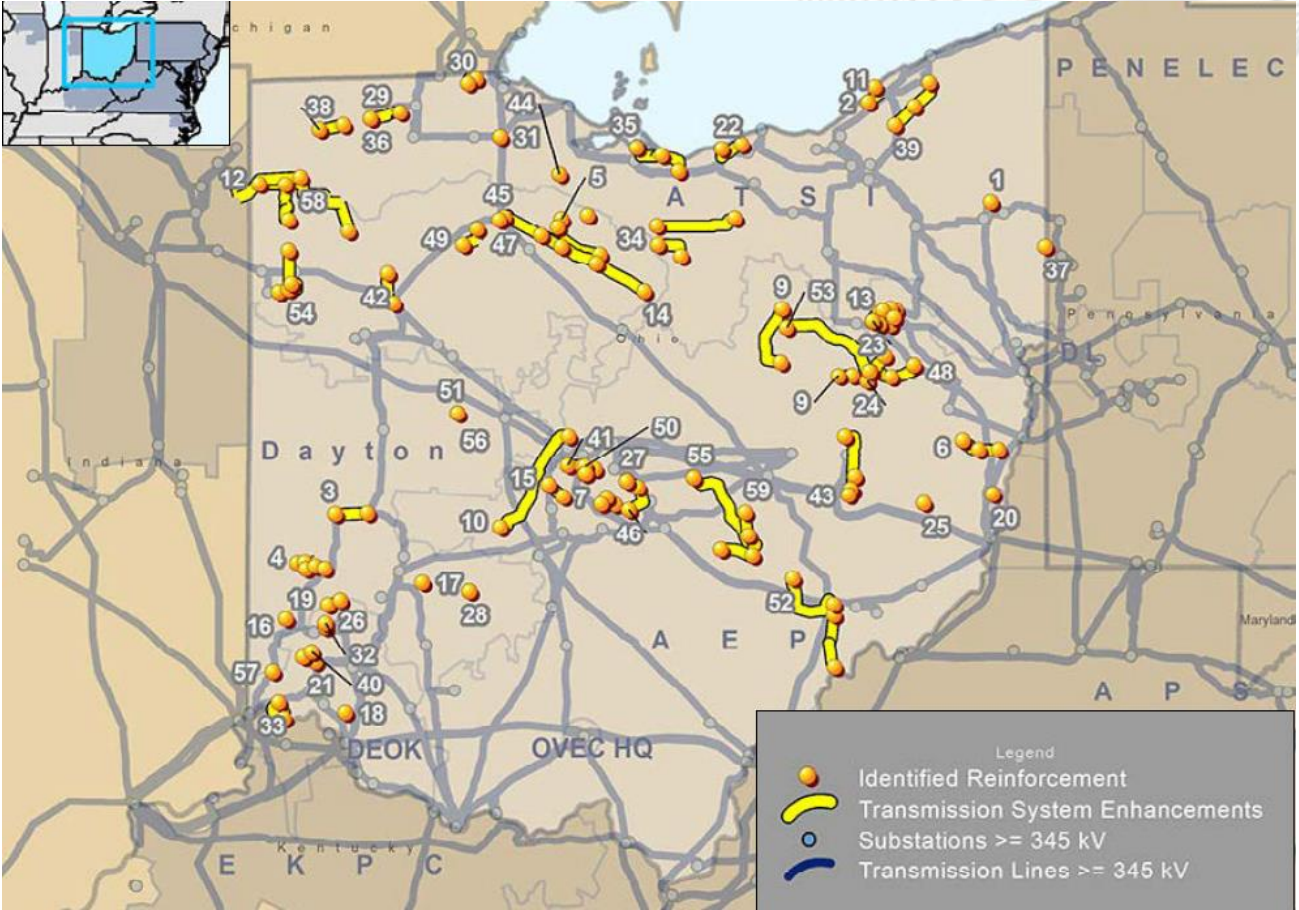
OH Baseline Projects	
TO Zone	Cost (\$M)
AEP	\$26.17
ATSI	\$38.39

Note: Baseline upgrades are those that resolve a system reliability criteria violation.



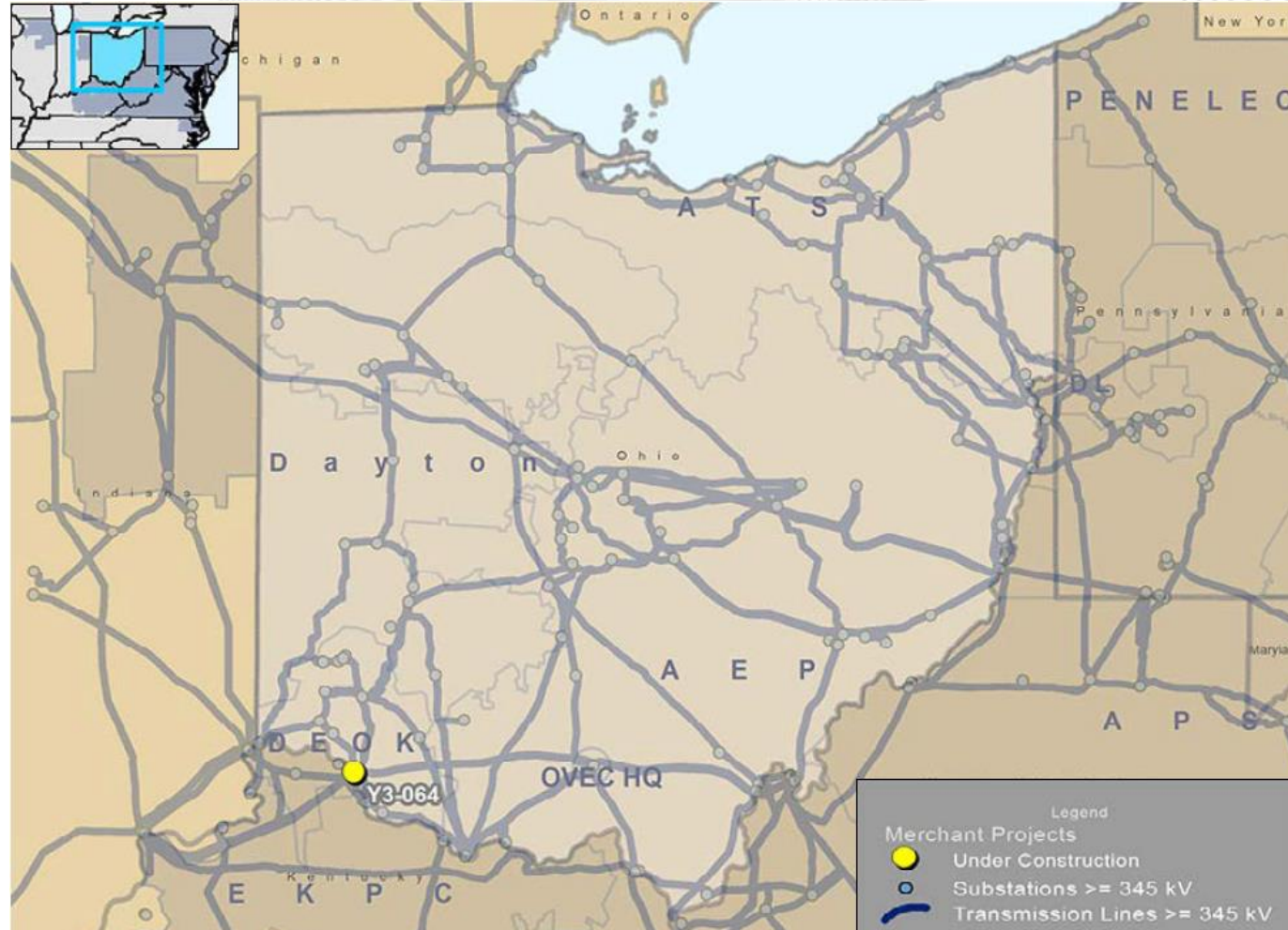
OH Network Projects	
TO Zone	Cost (\$M)
AEP	\$8.42
ATSI	\$7.31
DAYTON	\$23.34

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.



OH Supplemental Projects	
TO Zone	Cost (\$M)
AEP	\$468.68
AMPT	\$16.95
ATSI	\$70.50
DAYTON	\$50.47
DEO&K	\$51.74

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.

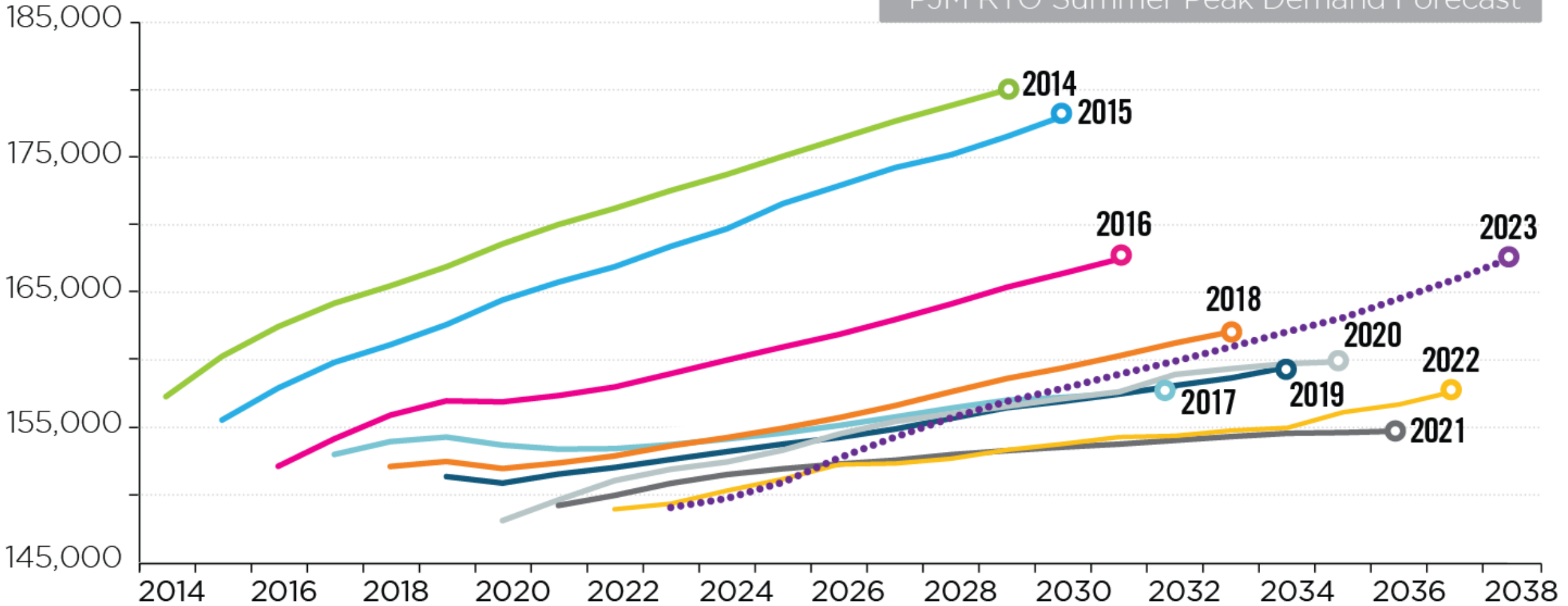


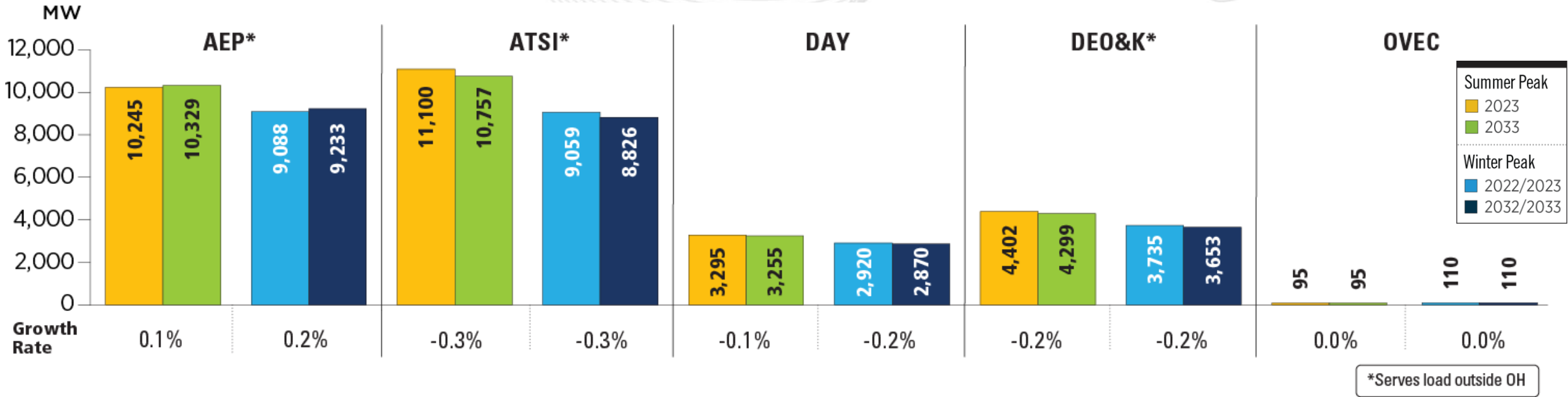
Queue Number	Queue Name	TO Zone	Status	Actual or Requested In-Service Date	Maximum Output (MW)
Y3-064	Pierce-Beckjord 138 kV	DEO&K	Under Construction	12/20/2020	160

Planning Load Forecast

Load (MW)

PJM RTO Summer Peak Demand Forecast





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

2023	2033
149,059 MW	160,971 MW
Growth Rate 0.8%	

PJM RTO Winter Peak

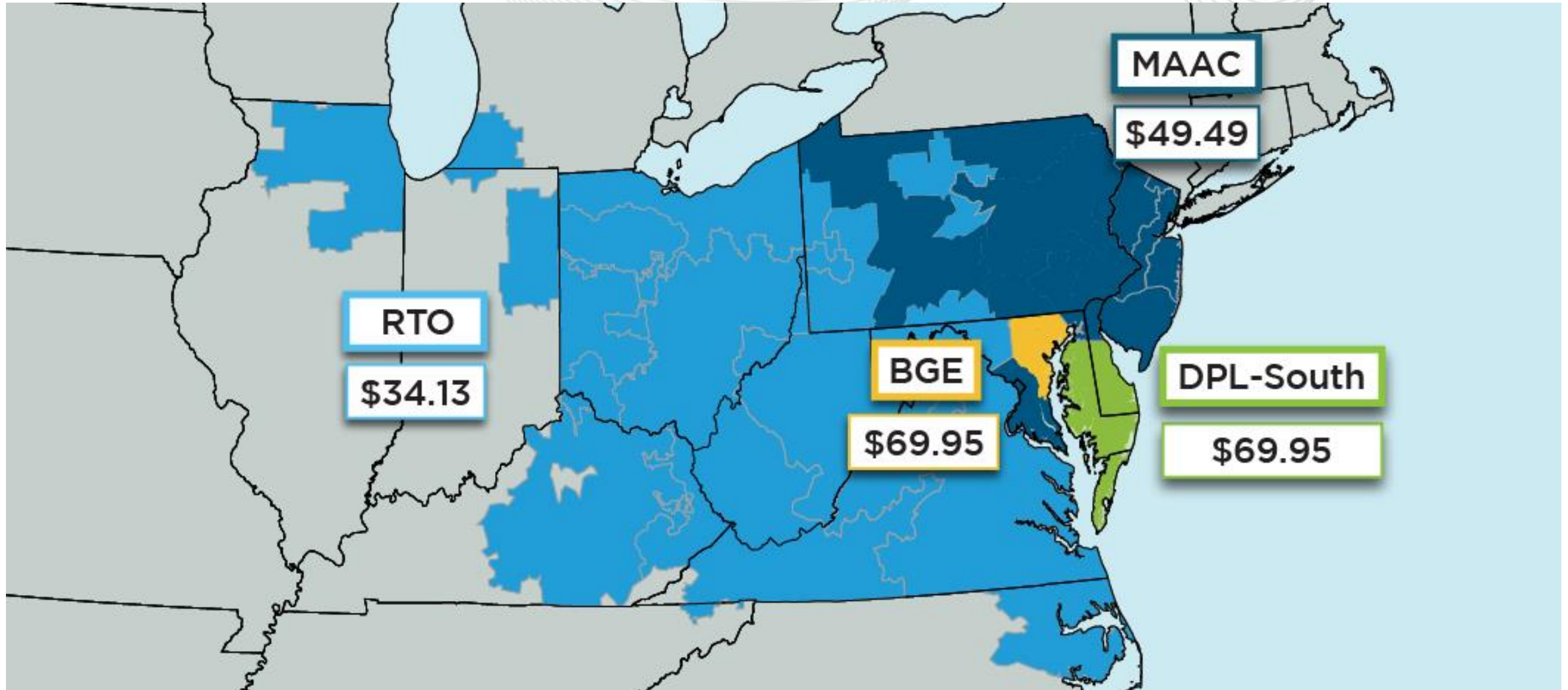
2022/2023	2032/2033
130,811 MW	144,992 MW
Growth Rate 1.0%	

Markets

Capacity Market Results



2023/24 Base Residual Auction Clearing Prices (\$/MW-Day)



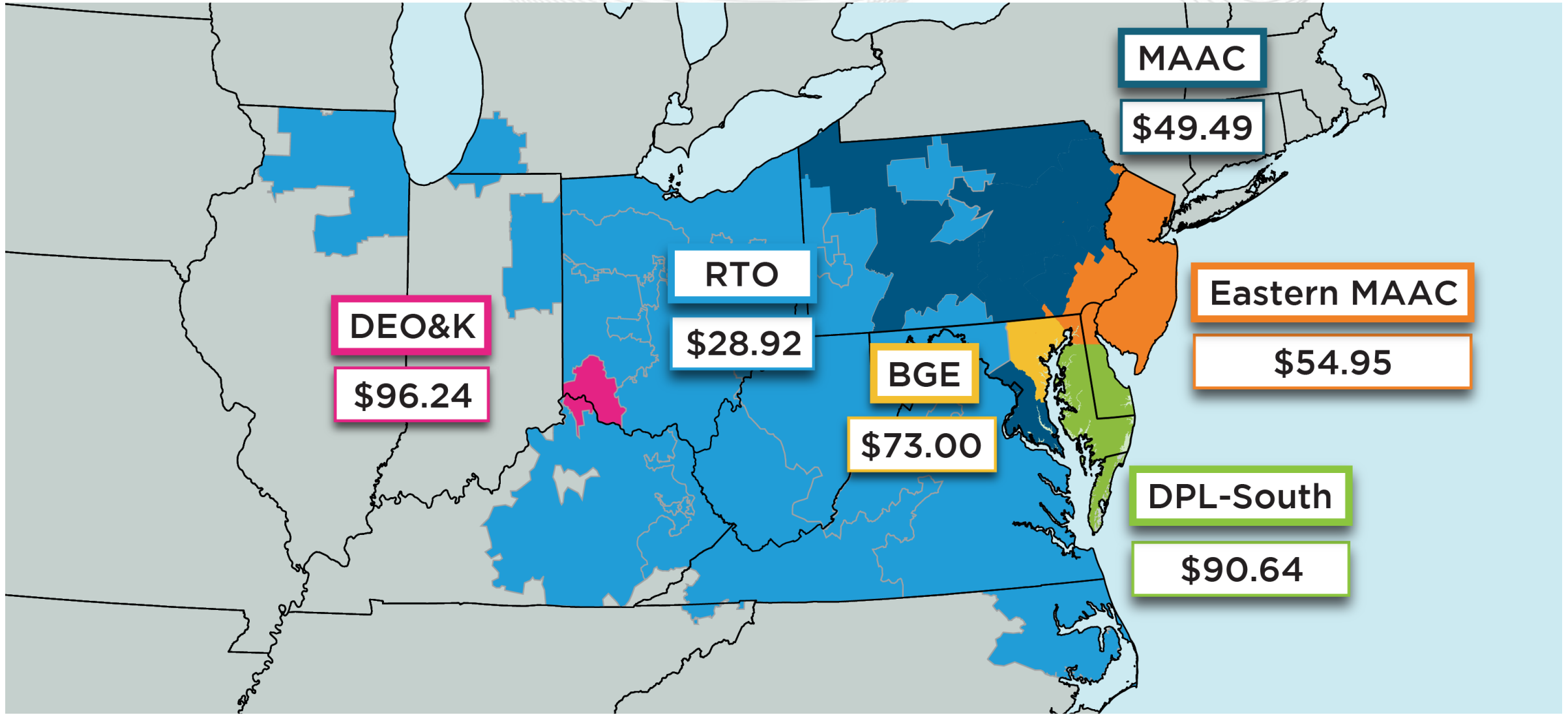


2023/24 Cleared MW (UCAP) by Resource Type

	ANNUAL	SUMMER	WINTER	Total (MW)
Generation	131,256.3	47.0	474.1	131,777.4
DR	7,919.1	177.1	0.0	8,096.2
EE	5,221.1	250.0	0.0	5,471.1
Total (MW)	144,396.5	474.1	474.1	



2024/25 Base Residual Auction Clearing Prices (\$/MW-Day)



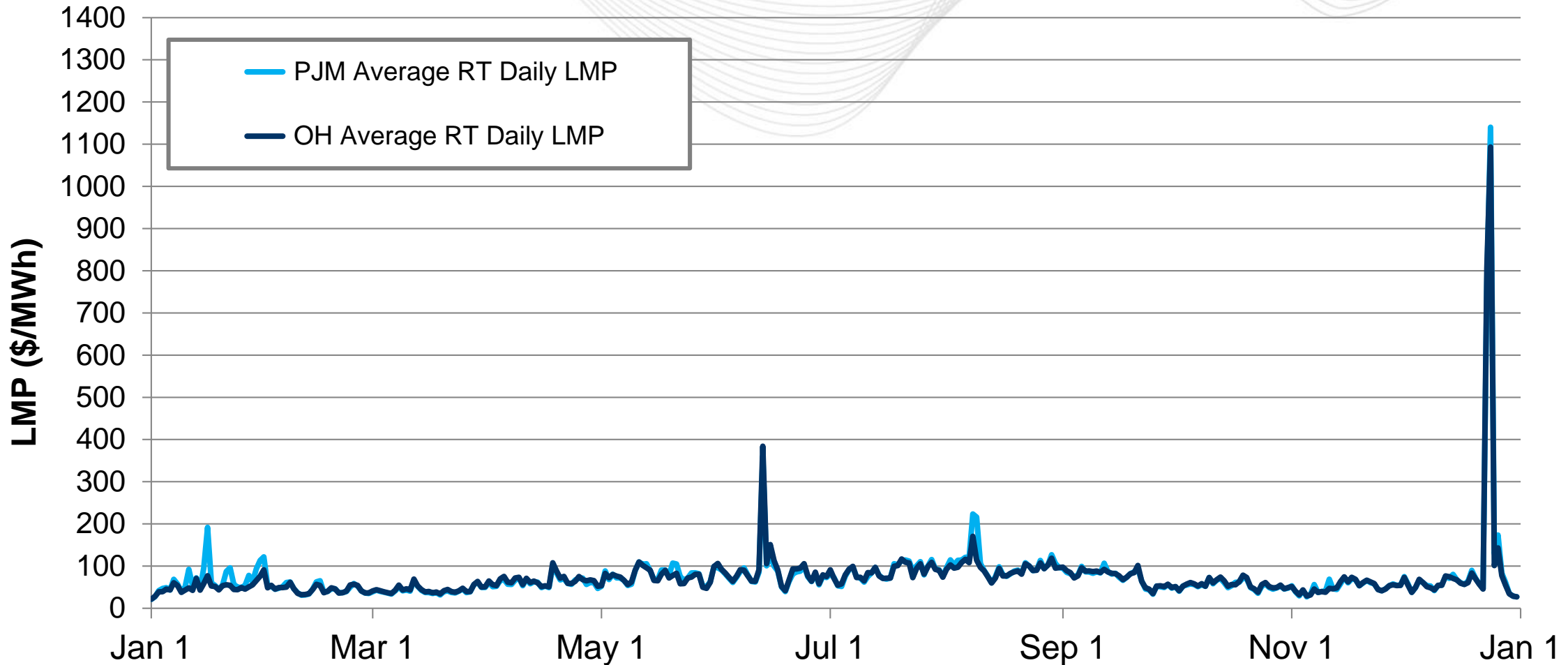


2024/2025 Cleared MW (UCAP) by Resource Type

	ANNUAL	SUMMER	WINTER	Total (MW)
Generation	131,779.3	38.2	605.6	132,423.1
DR	7,804.3	188.4	0	7,992.7
EE	7,289.7	379.0	0	7,668.7
Total (MW)	146,873.3	605.6	605.6	

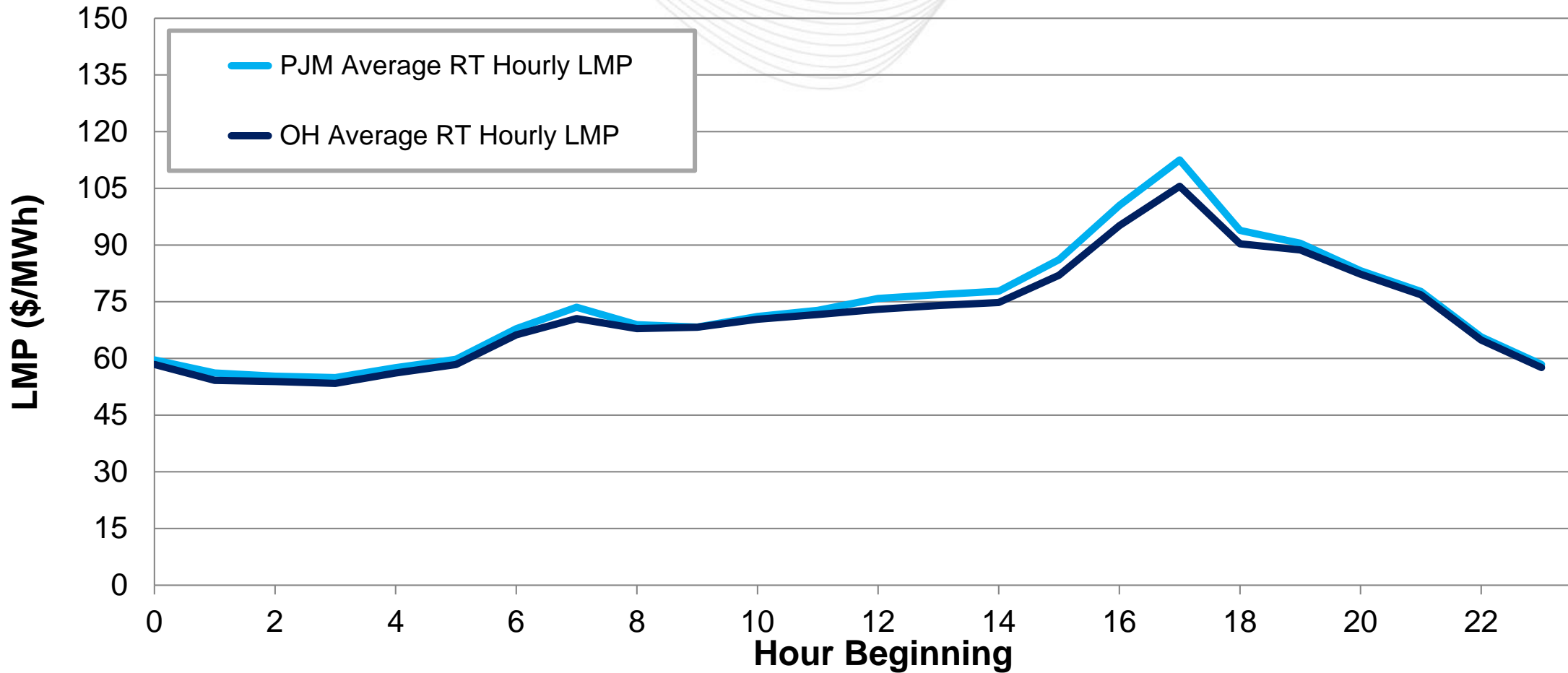
Markets

Market Analysis



Note: The significant price spike in late Dec. 2022 was a result of Winter Storm Elliott's impact on system conditions.

Ohio's average hourly LMPs generally aligned with the PJM average hourly LMP.



Ohio – Net Energy Import/Export Trend

(Jan. 2022 – Dec. 2022)



Positive values represent exports and negative values represent imports.

Operations

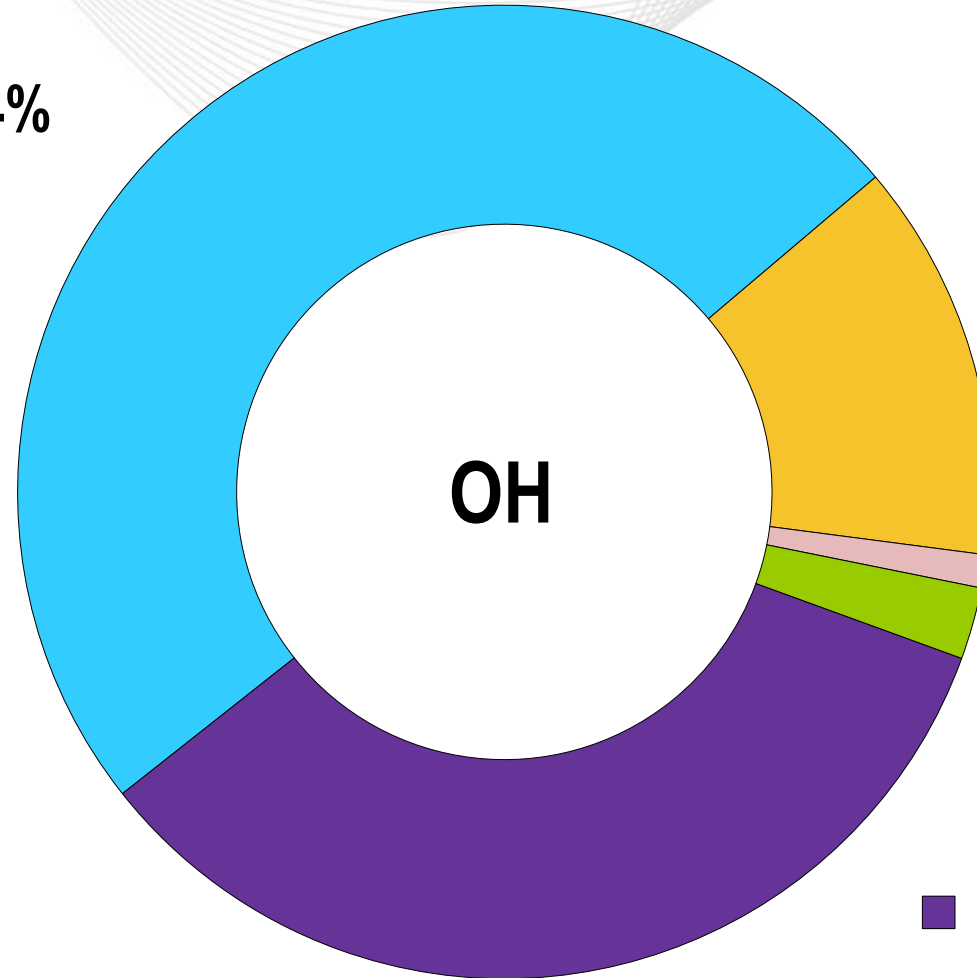
■ Natural Gas, **49.4%**

■ Nuclear, **13.3%**

■ Other, **1.1%**

■ Wind, **2.4%**

■ Coal, **33.8%**



The data in this chart comes from EIA Form 923 (2022).

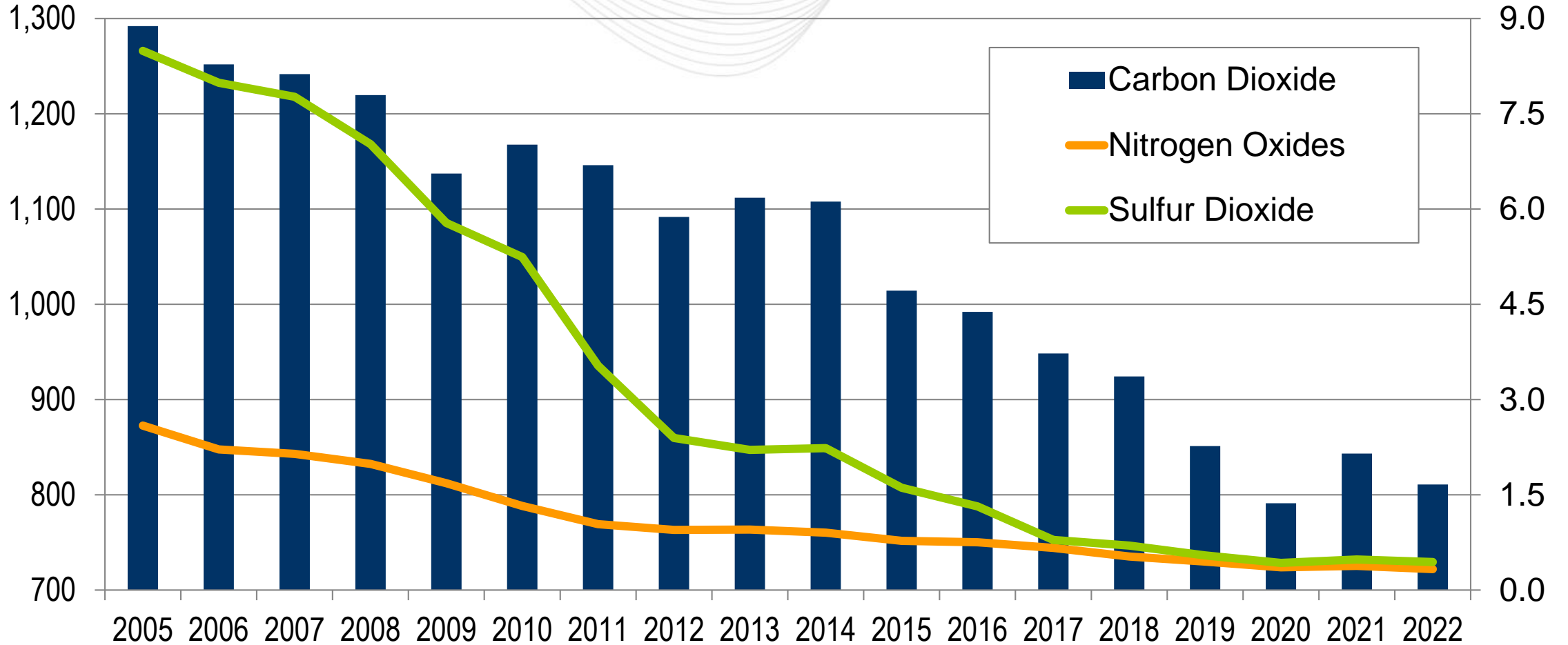


2005 – 2022 PJM Average Emissions

(March 2023)

CO₂
(lbs/MWh)

SO₂ and NO_x
(lbs/MWh)





Ohio – Average Emissions (lbs/MWh)

(March 2023)

CO₂
(lbs/MWh)

SO₂ and NO_x
(lbs/MWh)

