



2022 Kentucky State Infrastructure Report

(January 1, 2022 – December 31, 2022)

May 2023

This report reflects information for the portion of Kentucky within the PJM service territory.

1. Planning

- Generation Portfolio Analysis
- Transmission Analysis
- Load Forecast

2. Markets

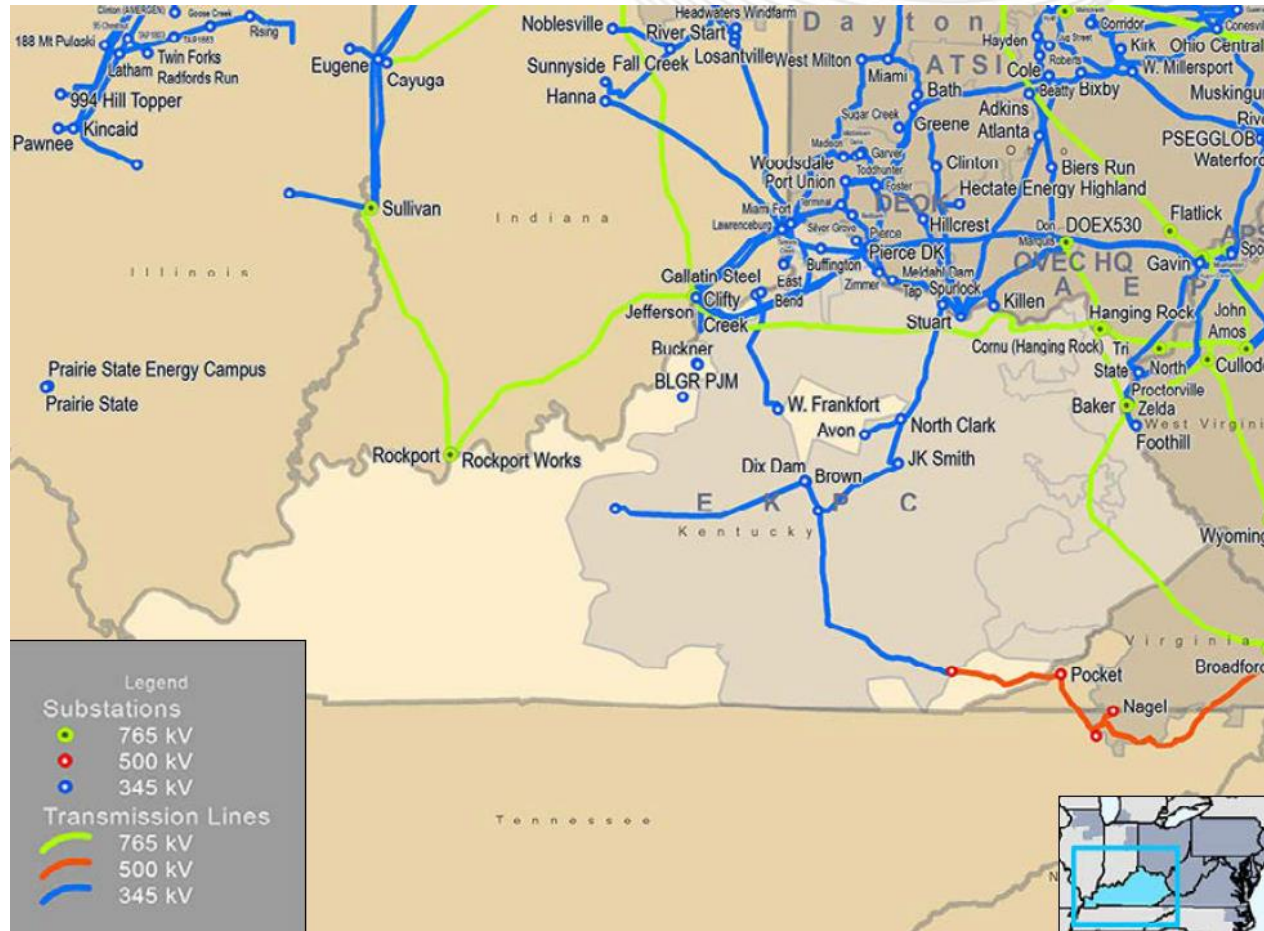
- Capacity Market Results
- Market Analysis
- Net Energy Import/Export Trend

3. Operations

- Generator Production
- Emissions Data

- **Existing Capacity:** Coal represents approximately 53.5 percent of the total installed capacity in the Kentucky service territory while natural gas represents approximately 43.7 percent. Comparatively across PJM, natural gas and coal are at 44.6 and 24.0 percent of total installed capacity.
- **Interconnection Requests:** Approximately 95.4 of the proposed generation in Kentucky is solar, while storage comprises 4.6 percent of proposed generation.
- **Deactivations:** Kentucky had no generators deactivate or give a notice of deactivation in 2022.
- **RTEP 2022:** Kentucky's 2022 RTEP project total represents approximately \$89.26 million in investment.
- **Load Forecast:** Kentucky's peak load growth is projected to range between -0.2 and 0.3 percent annually over the next ten years, based on the service territory. The overall PJM RTO projected summer load growth rate is 0.8 percent.

- **2023/24 Capacity Market:** The portion of Kentucky within the PJM footprint cleared at the RTO price of \$34.13/MW-day in the 2023/2024 Base Residual Auction.
- **2024/25 Capacity Market:** The portion of Kentucky within the PJM footprint 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:** Kentucky's average hourly LMPs generally aligned with the PJM average hourly LMP.
- **Emissions:** Kentucky's average CO2 emissions slightly decreased in 2022 compared to 2021 levels.



The PJM service area in Kentucky is represented by the shaded portion of the map.

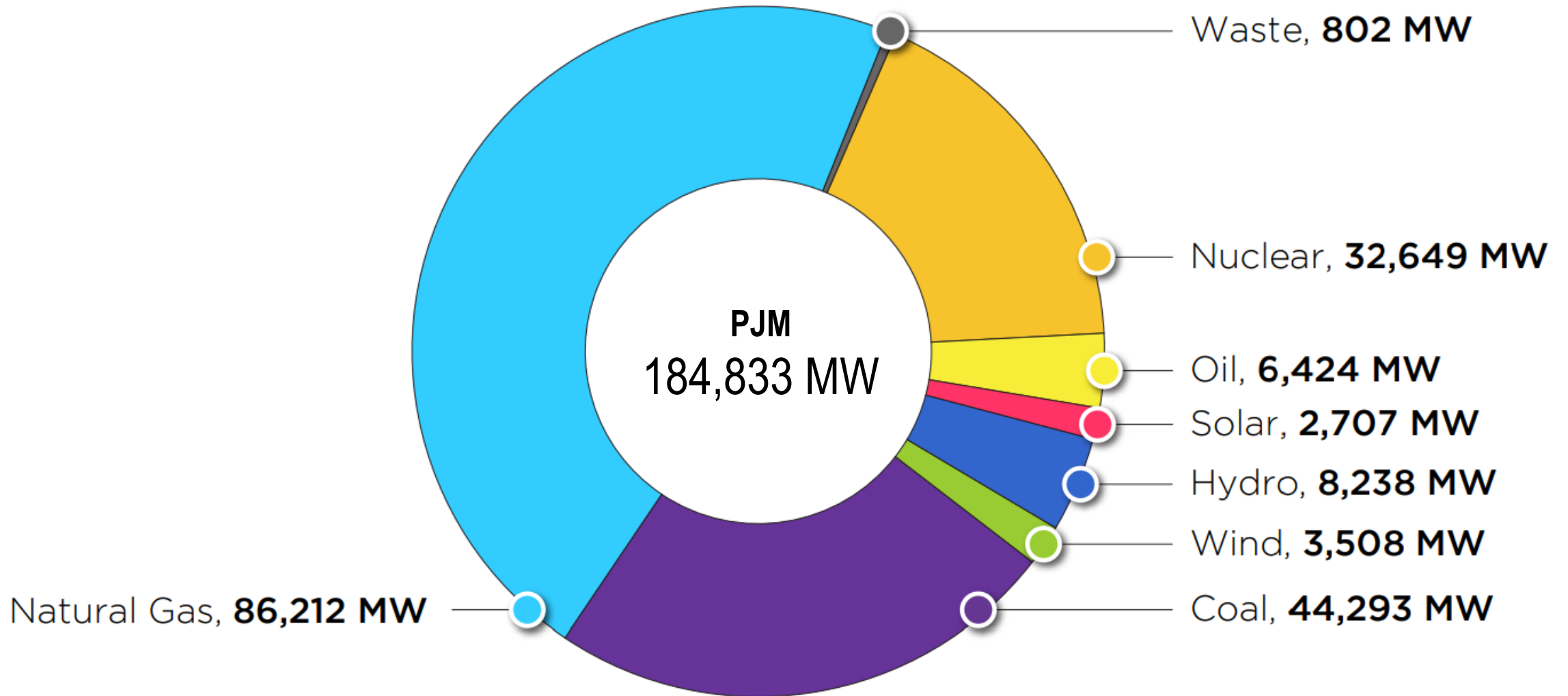
PJM operates transmission lines that extend beyond the service territory.

Planning

Generation Portfolio Analysis

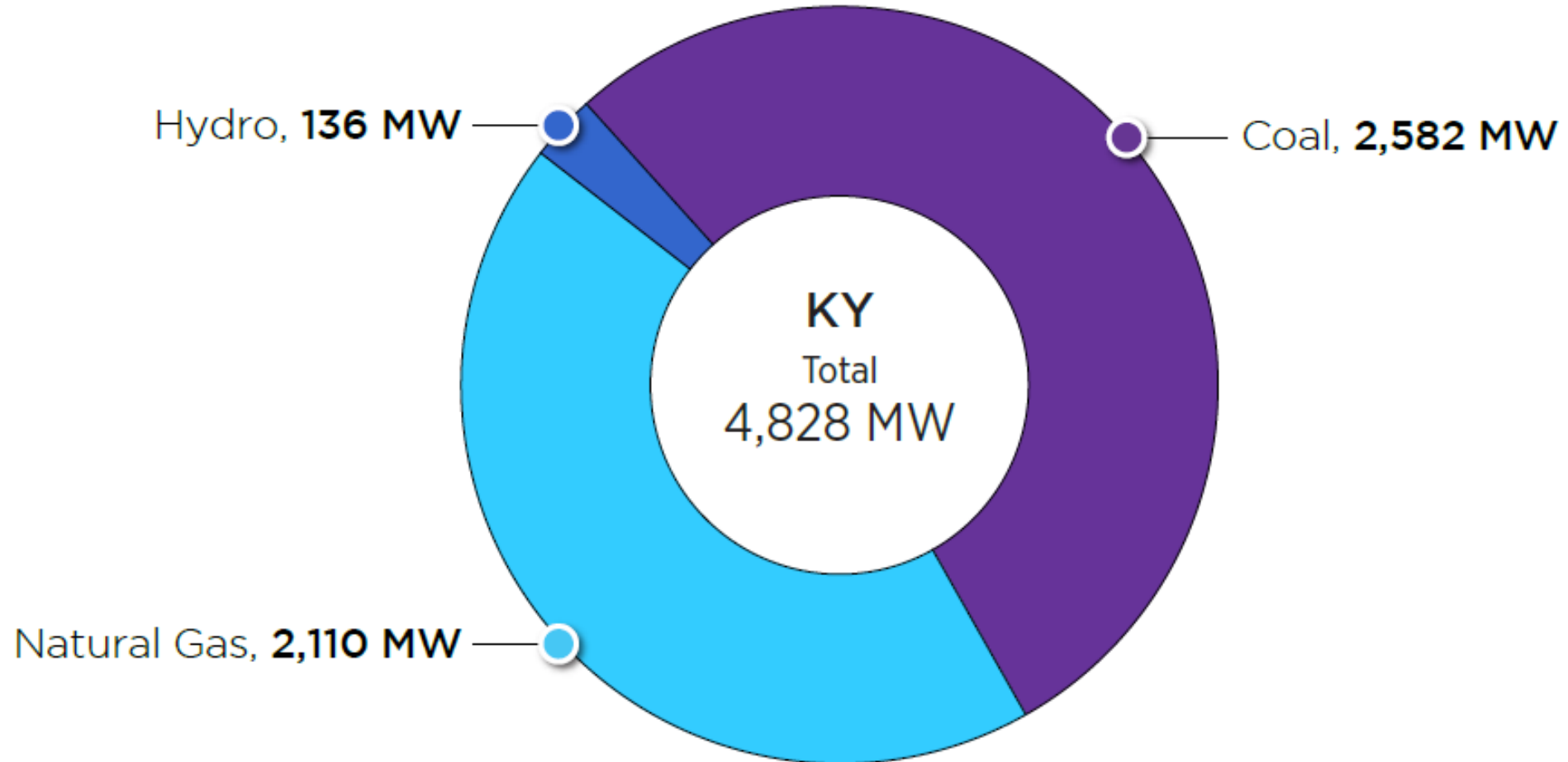
PJM – Existing Installed Capacity

(CIRs – as of Dec. 31, 2022)



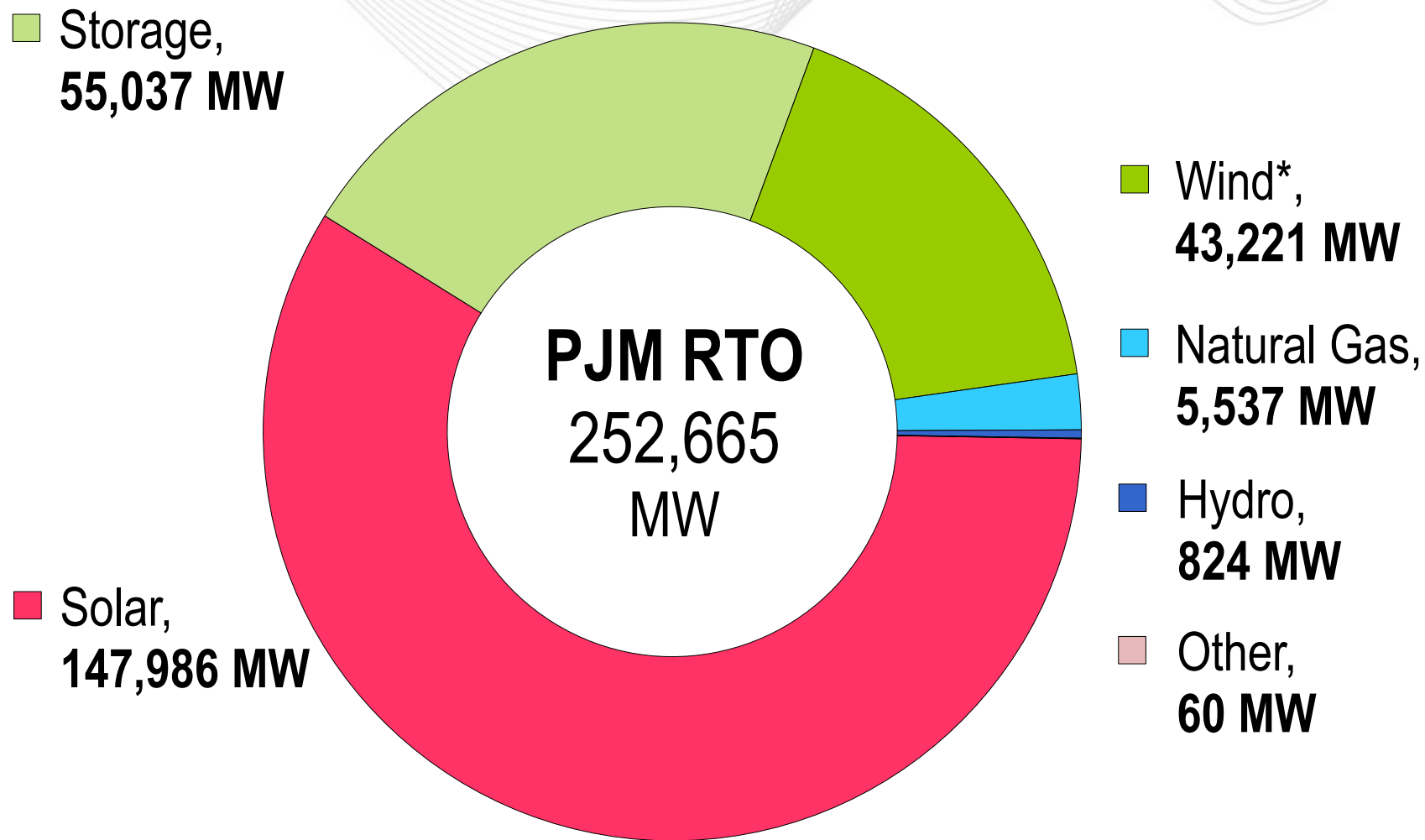
Kentucky – Existing Installed Capacity

(CIRs – as of Dec. 31, 2022)



PJM Queued Capacity (Nameplate) by Fuel Type

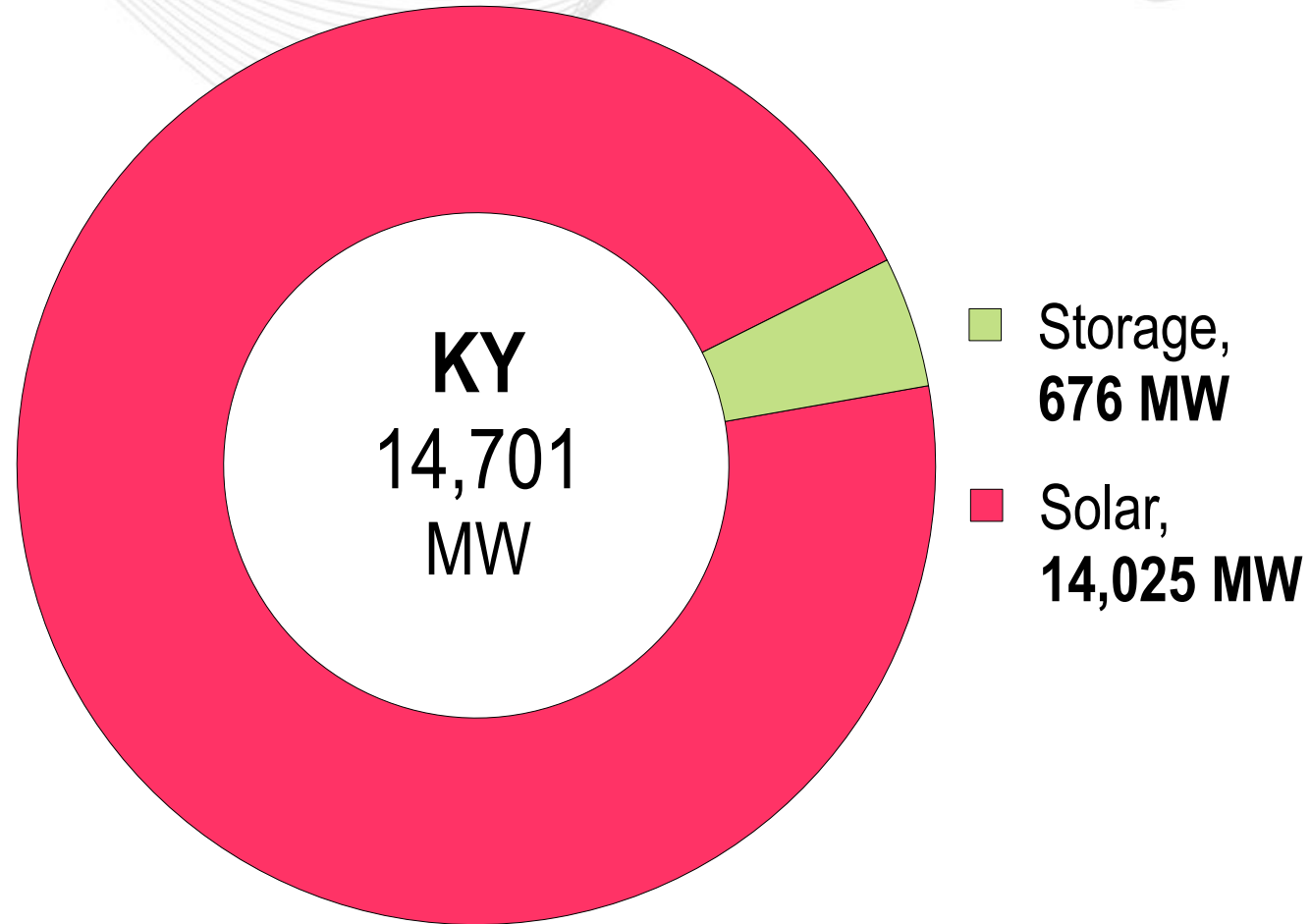
("Active" in the PJM Queue as of April 1, 2023)



*Wind includes both onshore and offshore wind

Kentucky Queued Capacity (Nameplate) by Fuel Type

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



Kentucky – 2022 Generator Deactivations

Kentucky had no generators deactivate or give a notice of deactivation in 2022.

Planning

Transmission Infrastructure Analysis

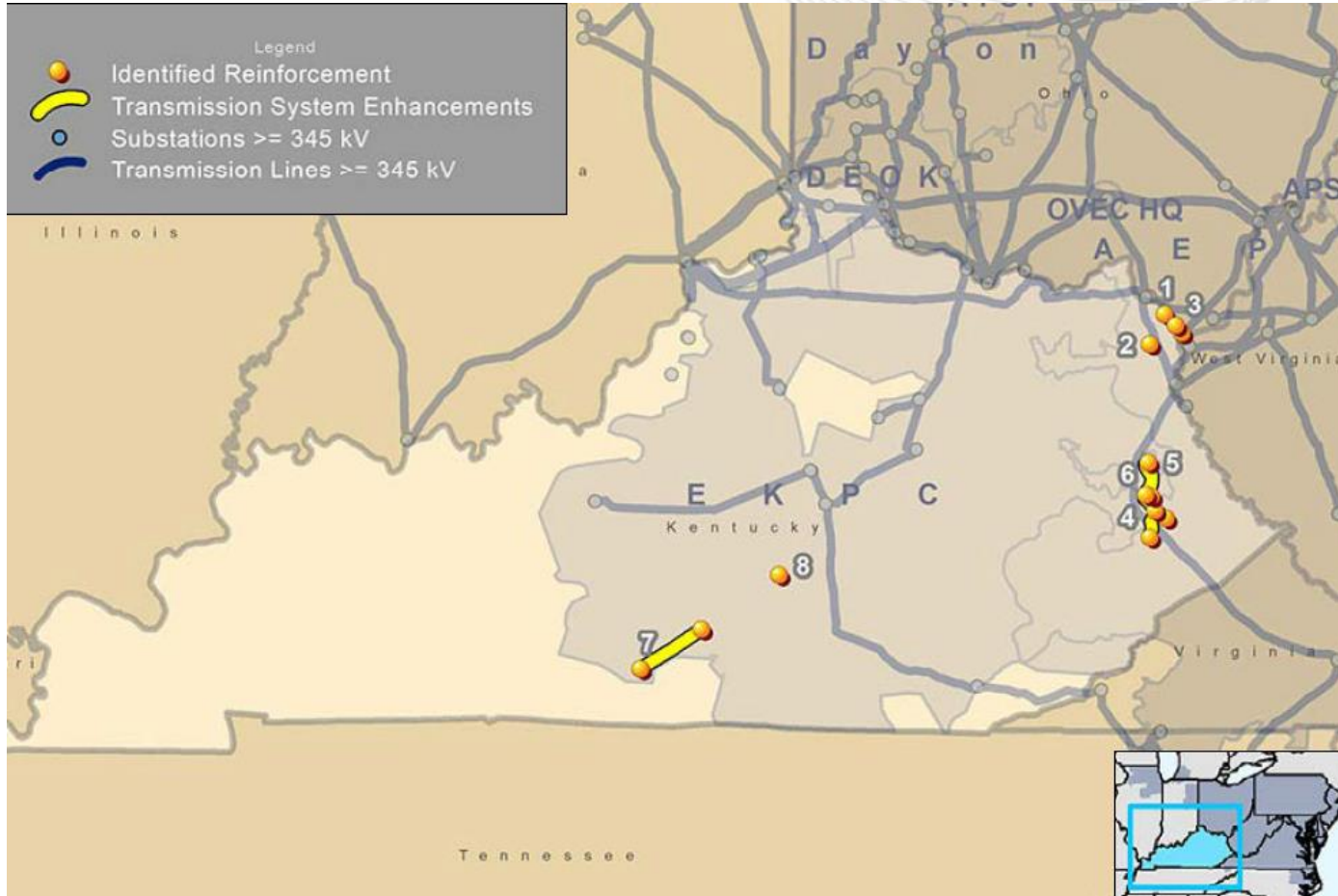


For reporting purposes, the 2022 state infrastructure reports provide maps displaying all baseline, network, and supplemental projects for the respective state. The reports also include aggregated project cost tables of these projects by Transmission Owner zone. For a detailed list of each project shown 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>

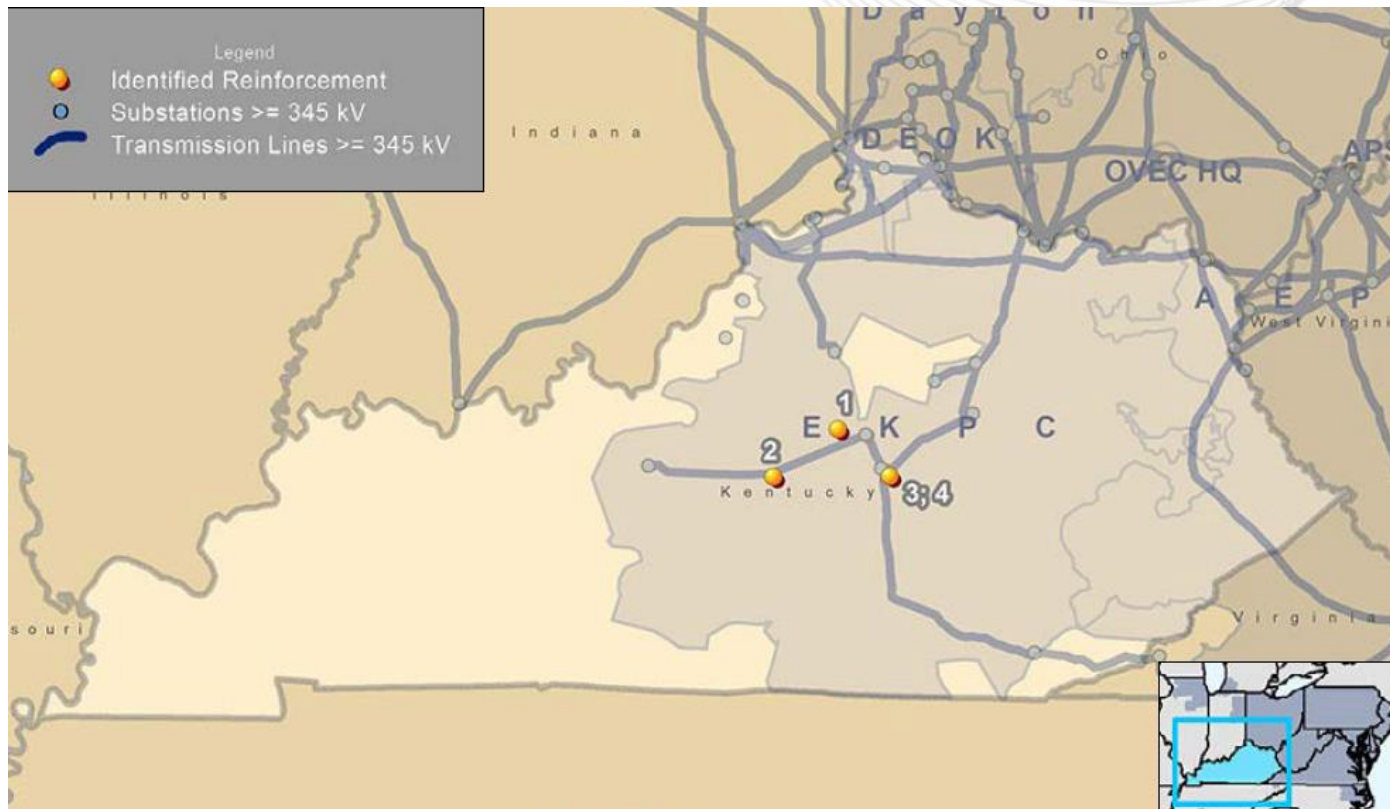
The complete list of all RTEP projects in PJM, including those from prior years, can be found at the **RTEP Upgrades & Status – Transmission Construction Status** page on pjm.com:

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



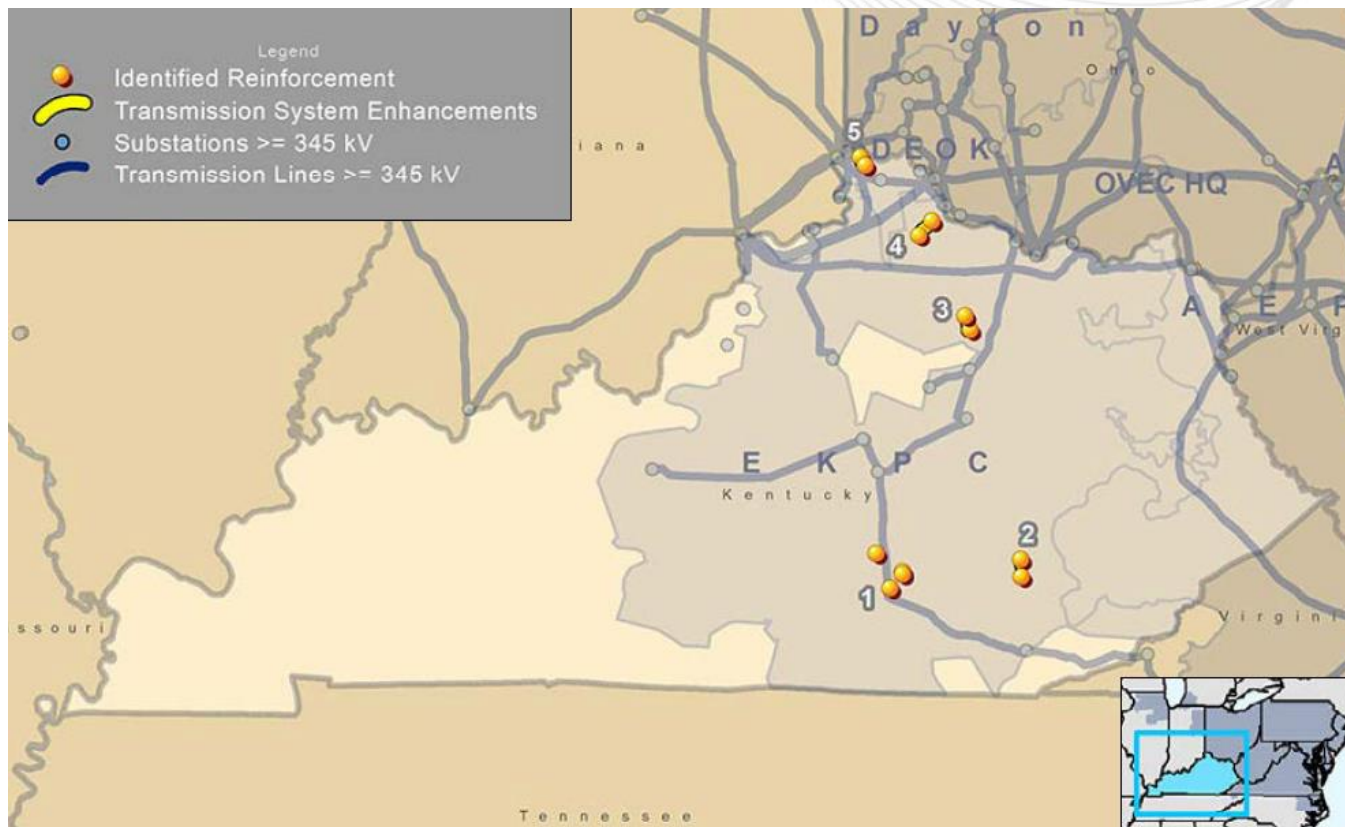
KY Baseline Projects	
TO Zone	Cost (\$M)
AEP	\$55.09
EKPC	\$0.73

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



KY Network Projects	
TO Zone	Cost (\$M)
EKPC	\$7.74

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.



KY Supplemental Projects	
TO Zone	Cost (\$M)
EKPC	\$20.90
DEO&K	\$4.80

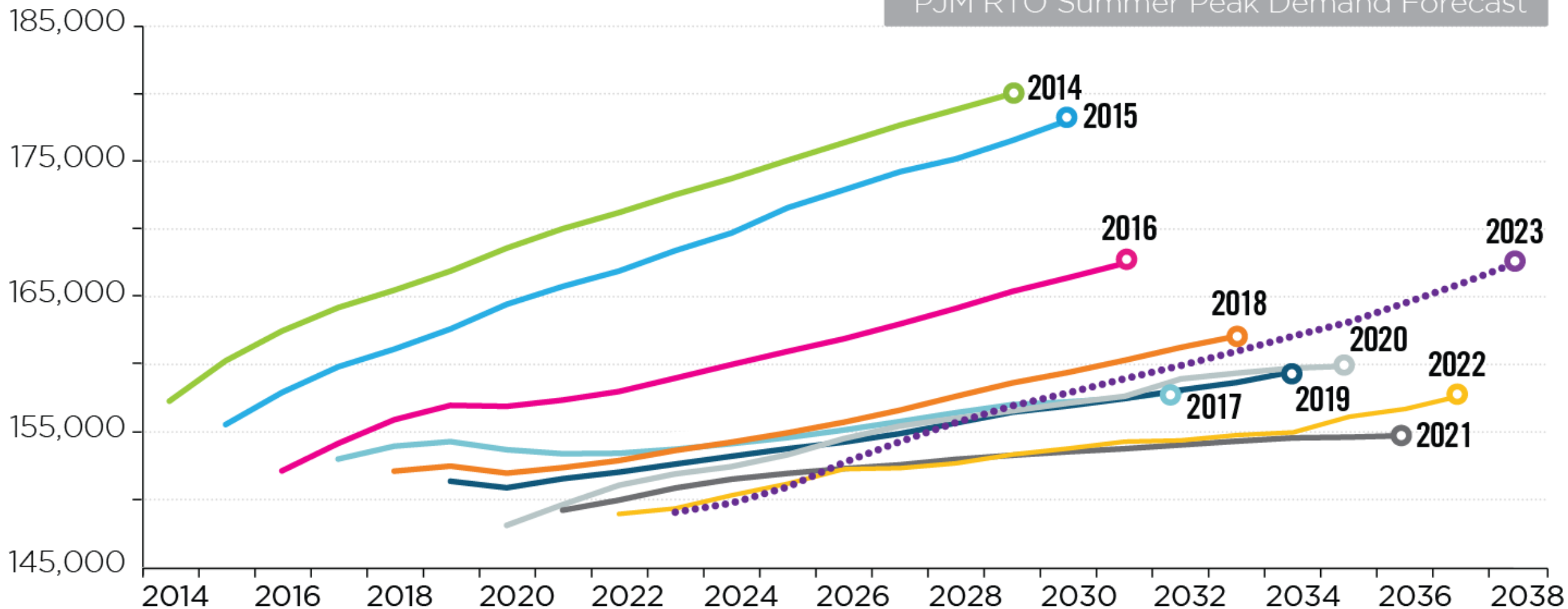
Note: Supplemental projects are transmission expansions or enhancements that are not required for compliance with PJM criteria and are not state public policy projects according to the PJM Operating Agreement. These projects are used as inputs to RTEP models, but are not required for reliability, economic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

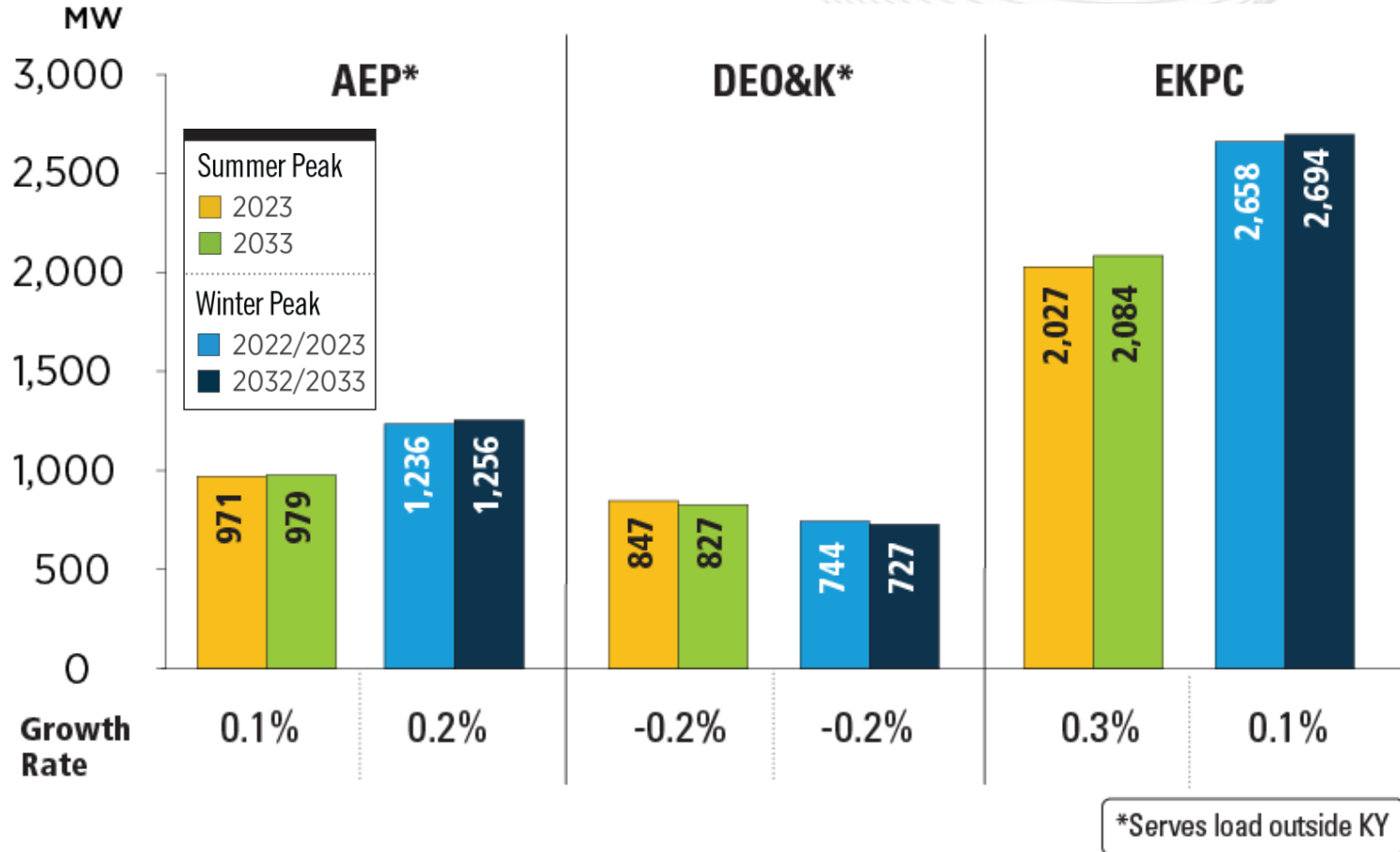
Planning

Load Forecast

Load (MW)

PJM RTO Summer Peak Demand Forecast





PJM RTO Summer Peak		PJM RTO Winter Peak	
2023	2033	2022/2023	2032/2033
149,059 MW	160,971 MW	130,811 MW	144,992 MW
Growth Rate 0.8%		Growth Rate 1.0%	

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.

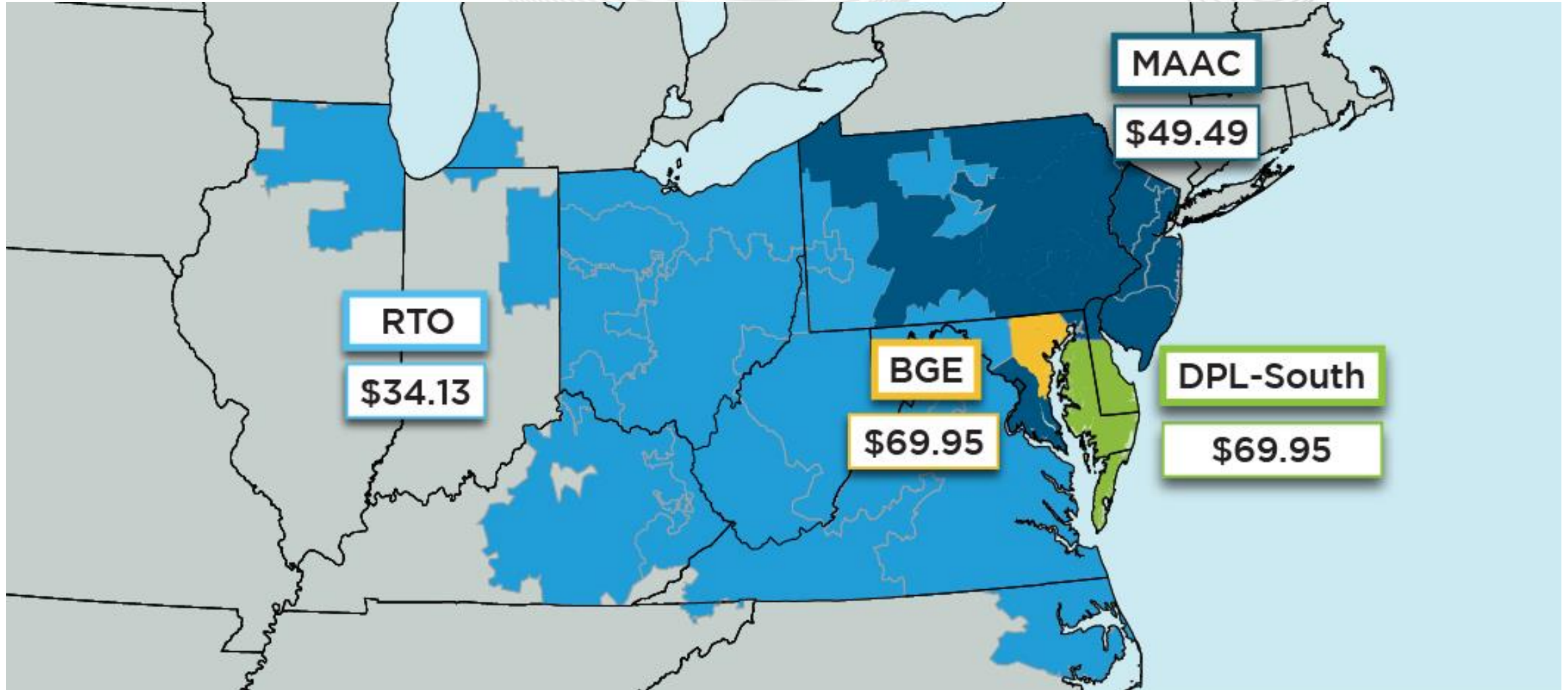


Markets

Capacity Market Results



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



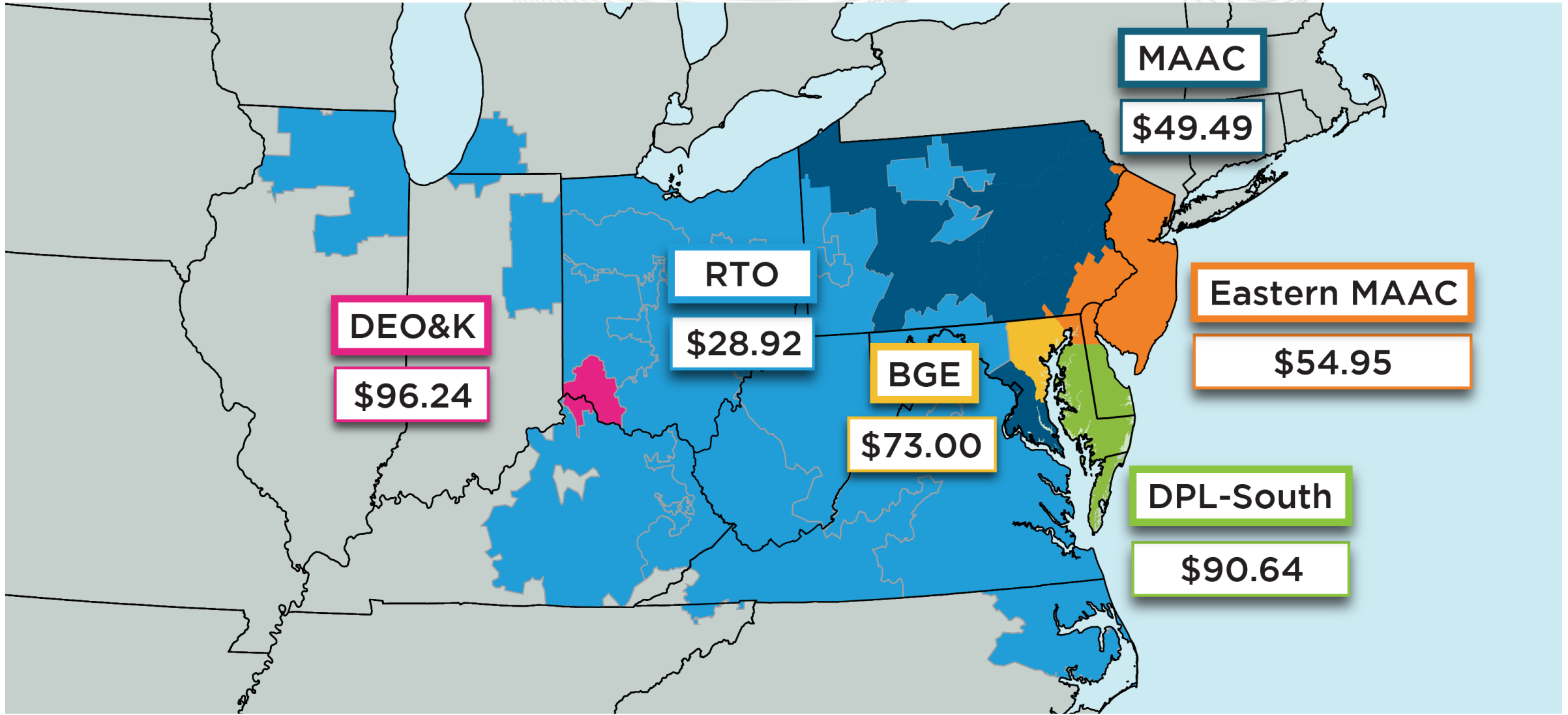


2023/24 Cleared MW (UCAP) by Resource Type

	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)





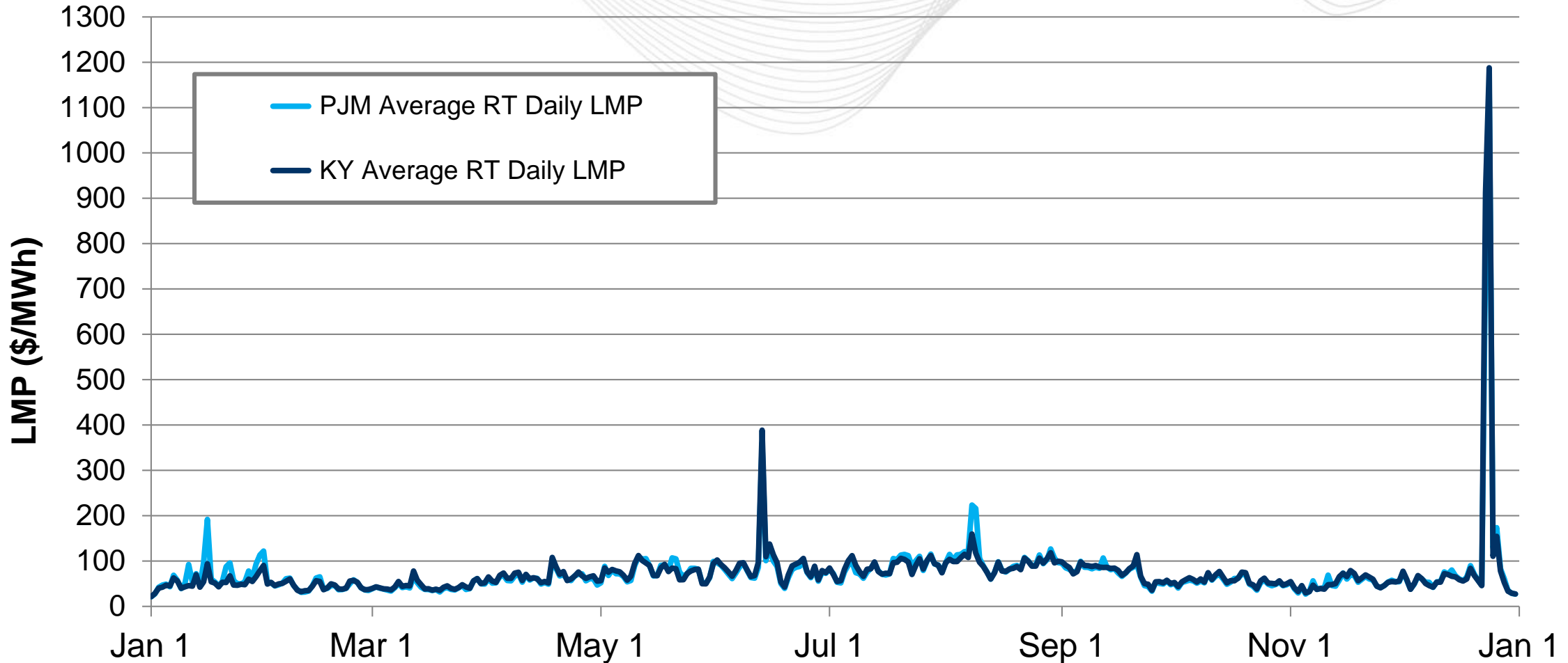
2024/2025 Cleared MW (UCAP) by Resource Type

	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	



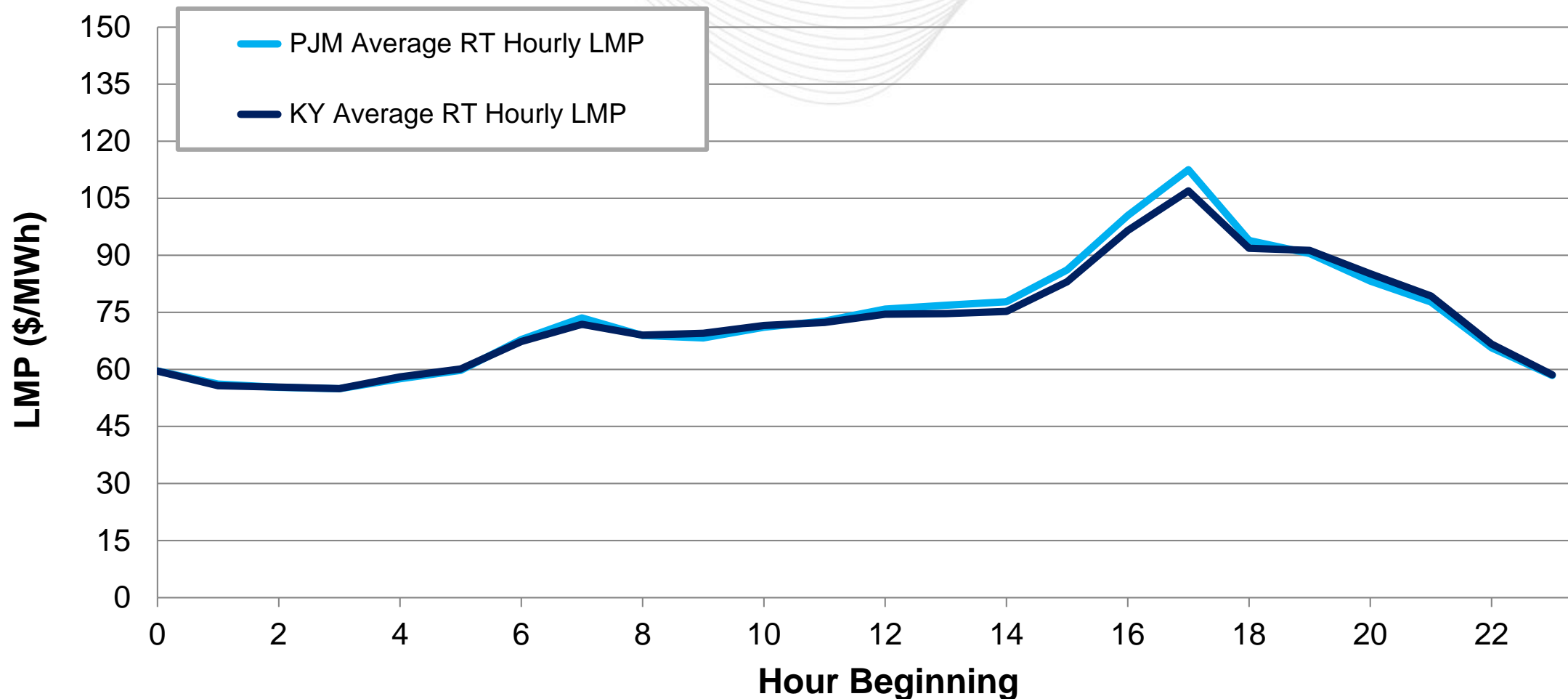
Markets

Market Analysis



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

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





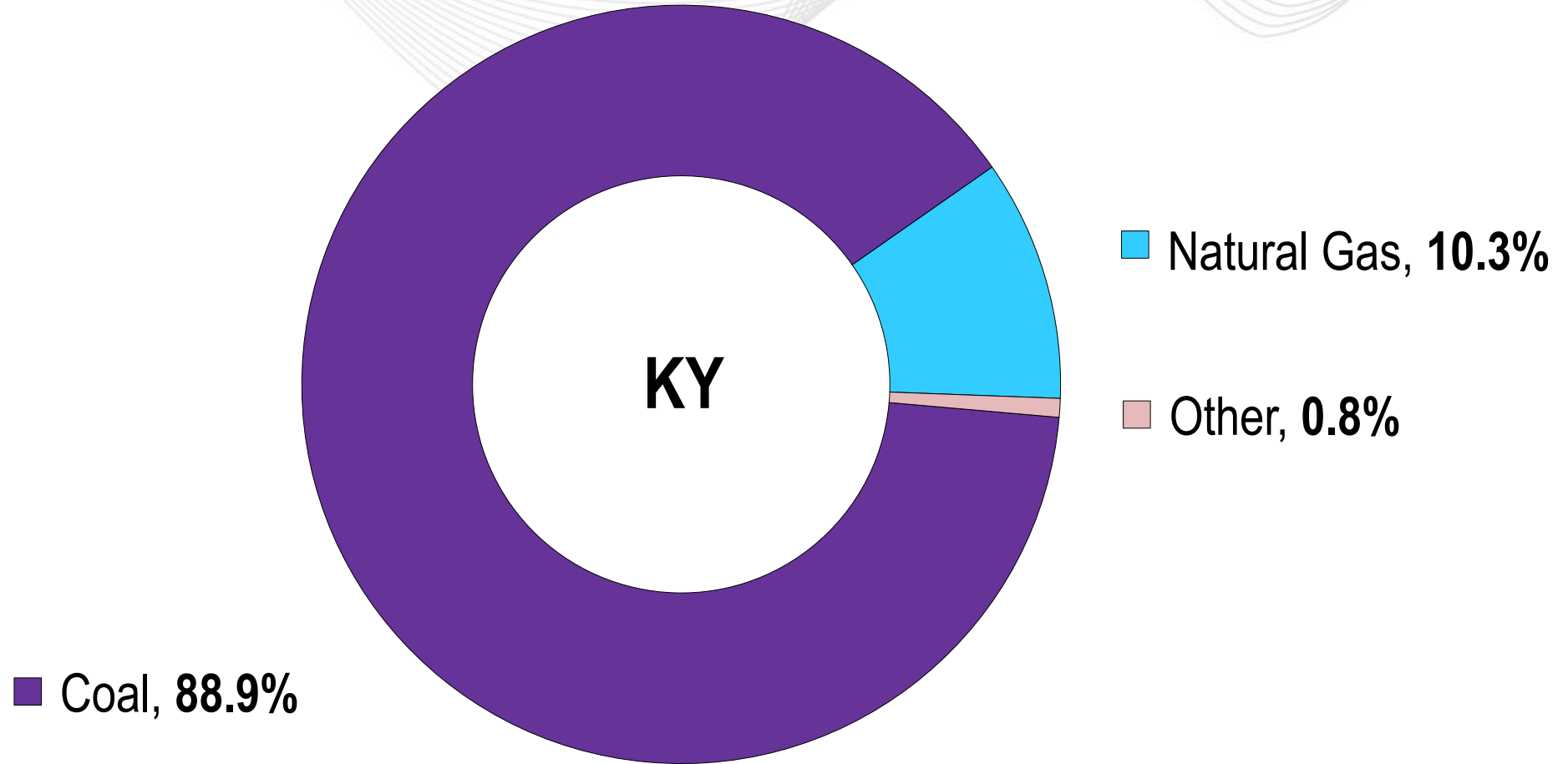
Kentucky – Net Energy Import/Export Trend

(Jan. 2022 – Dec. 2022)



This chart reflects the portion of Kentucky that PJM operates. Positive values represent exports and negative values represent imports.

Operations



The data in this chart comes from EIA Form 923 (2022) and represents only generators within the PJM portion of KY.

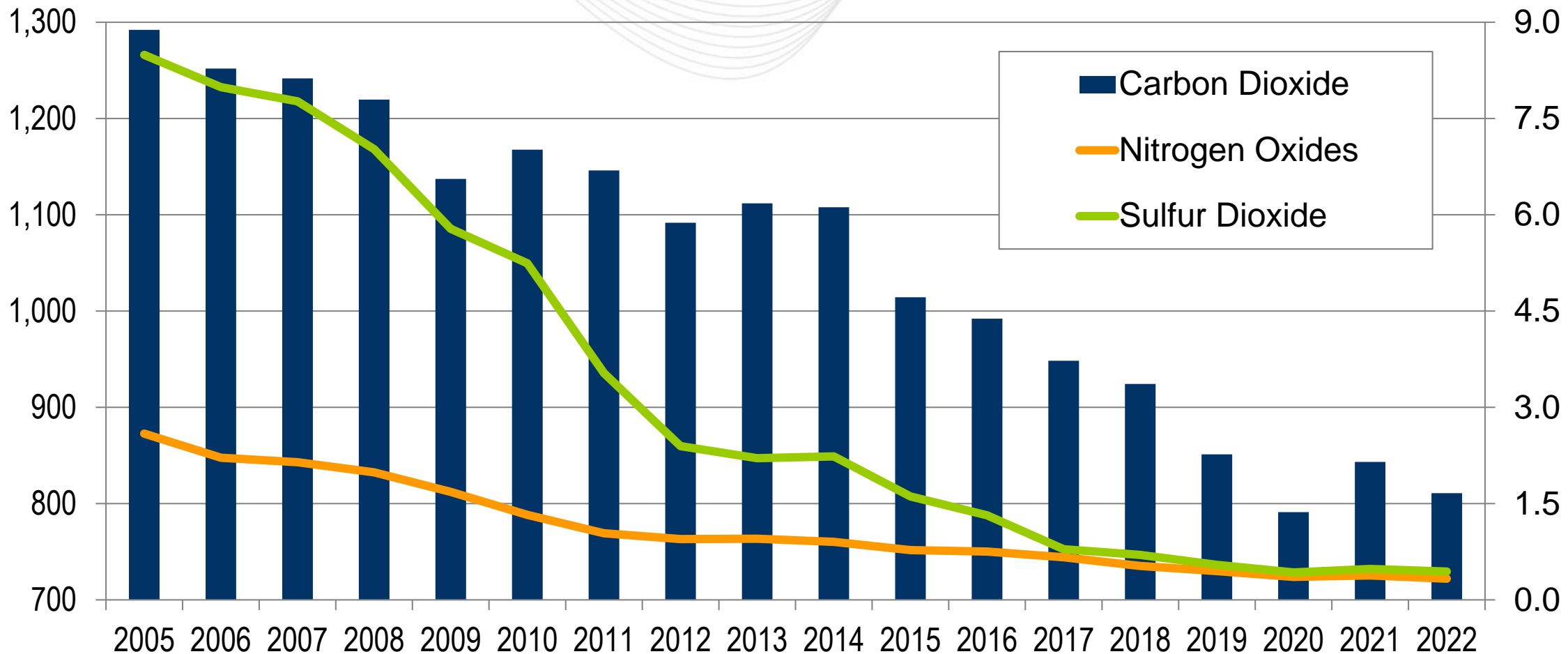


2005 – 2022 PJM Average Emissions

(March 2023)

CO₂
(lbs/MWh)

SO₂ and NO_x
(lbs/MWh)





Kentucky – Average Emissions (lbs/MWh)

(March 2023)

CO₂
(lbs/MWh)

SO₂ and NO_x
(lbs/MWh)

