



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

June 2024

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

Planning

- Generation Portfolio Analysis
- Transmission Analysis
- Load Forecast

Markets

- Market Analysis
- Net Energy Import/Export Trend

Operations

- Generator Production
- Emissions Data

In the Kentucky service territory:



Existing Capacity:

- In the Kentucky portion of PJM, coal represents 53% of the total installed capacity while natural gas represents 44%.
- In PJM, natural gas and coal are 48% and 22% of total installed capacity, respectively.



Interconnection Requests:

- Solar represents 95% of new interconnection requests while storage represents 5% of new requests.



Deactivations:

Kentucky had no generators deactivate or give a notice of deactivation in 2023.



RTEP 2023:

Kentucky's 2023 RTEP project total represents approximately \$214.8 million in investment.

In the Kentucky service territory:



Load Forecast:

Kentucky's summer peak load is projected to increase by 0.2% to 0.7% percent annually over the next ten years, while the winter peak is projected to increase by 0.1% to 0.3% 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 Kentucky State Infrastructure Report.



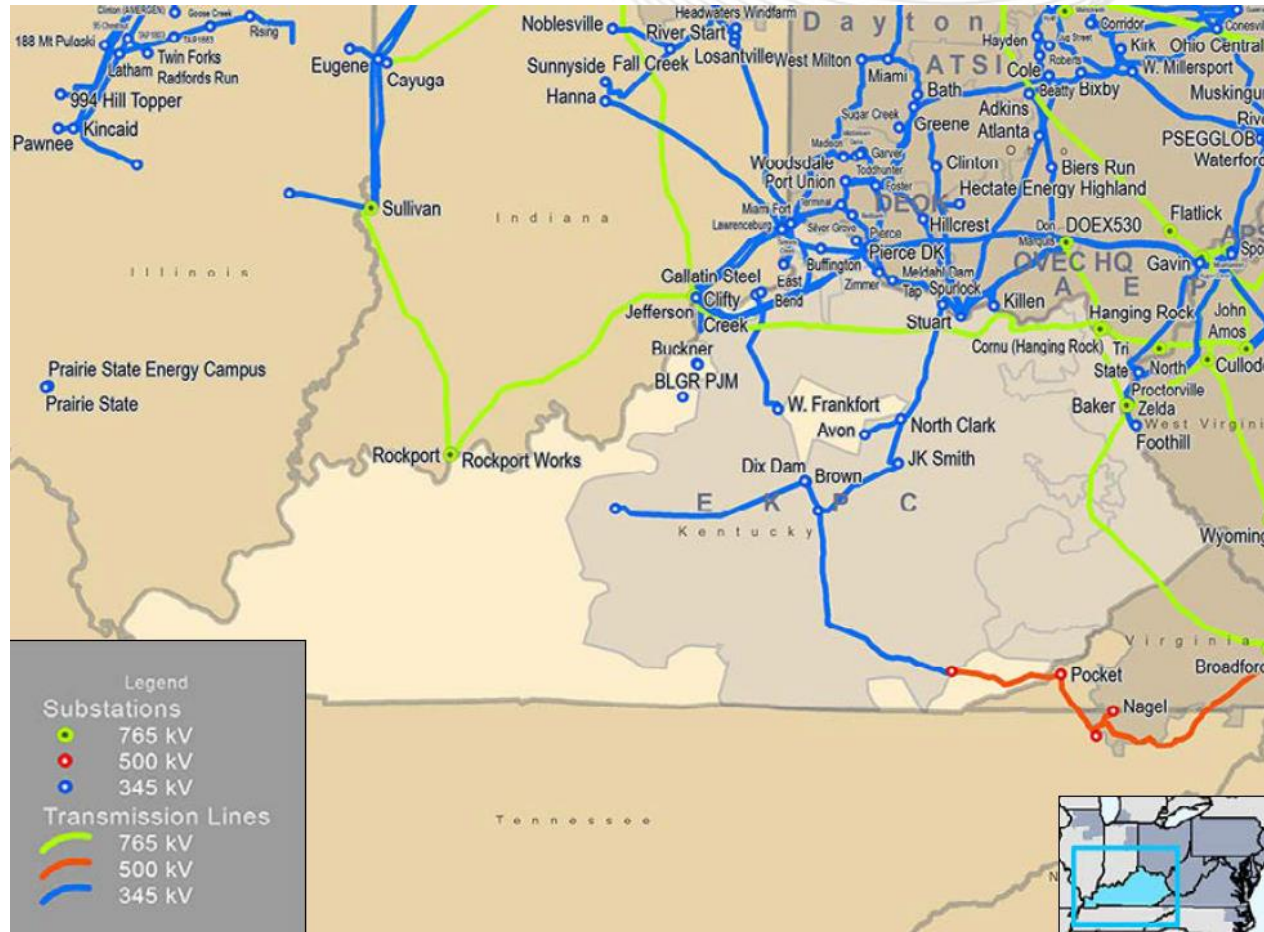
Market Performance:

Kentucky's average hourly LMPs were generally higher than the PJM average hourly LMP.



Emissions:

Kentucky's average CO₂ emissions increased in 2023 compared to 2022 levels.



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

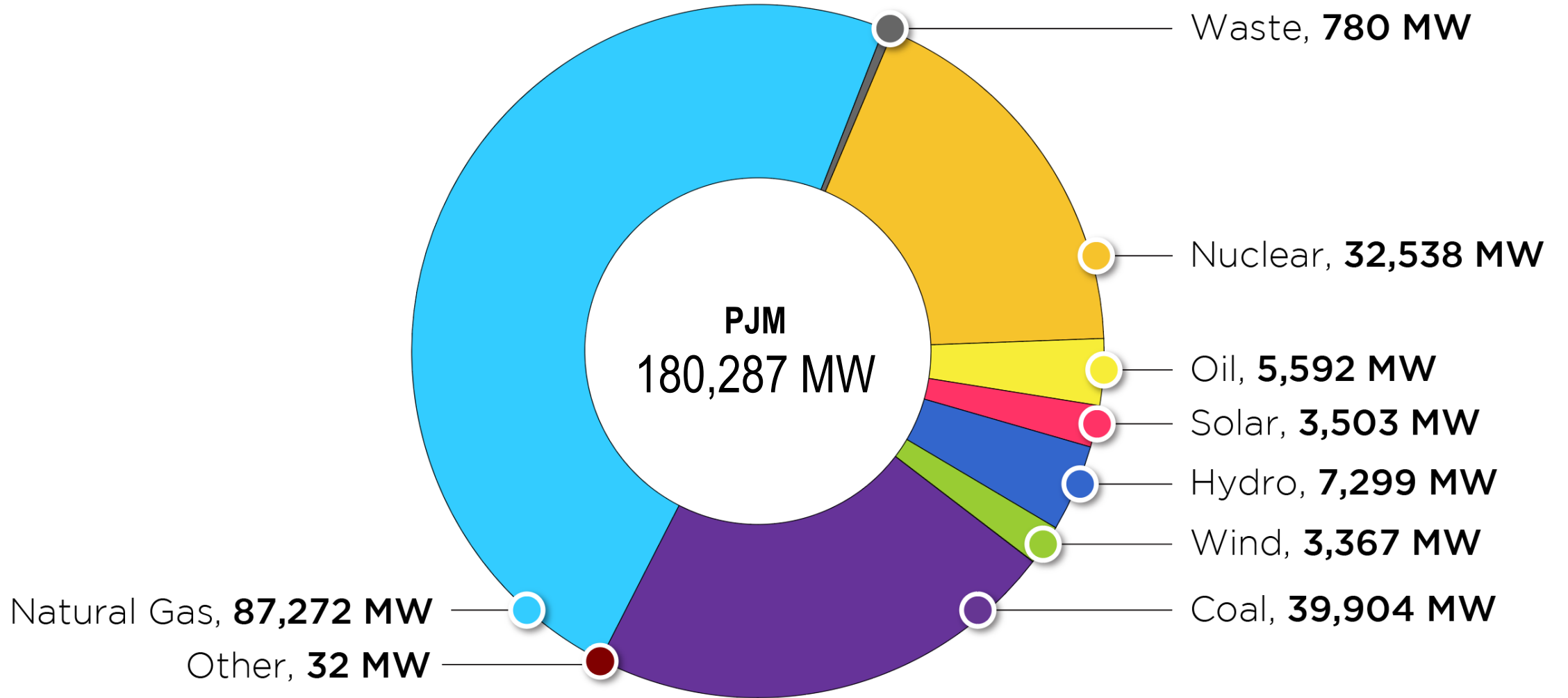
PJM operates transmission lines that extend beyond the service territory.

Planning

Generation Portfolio Analysis

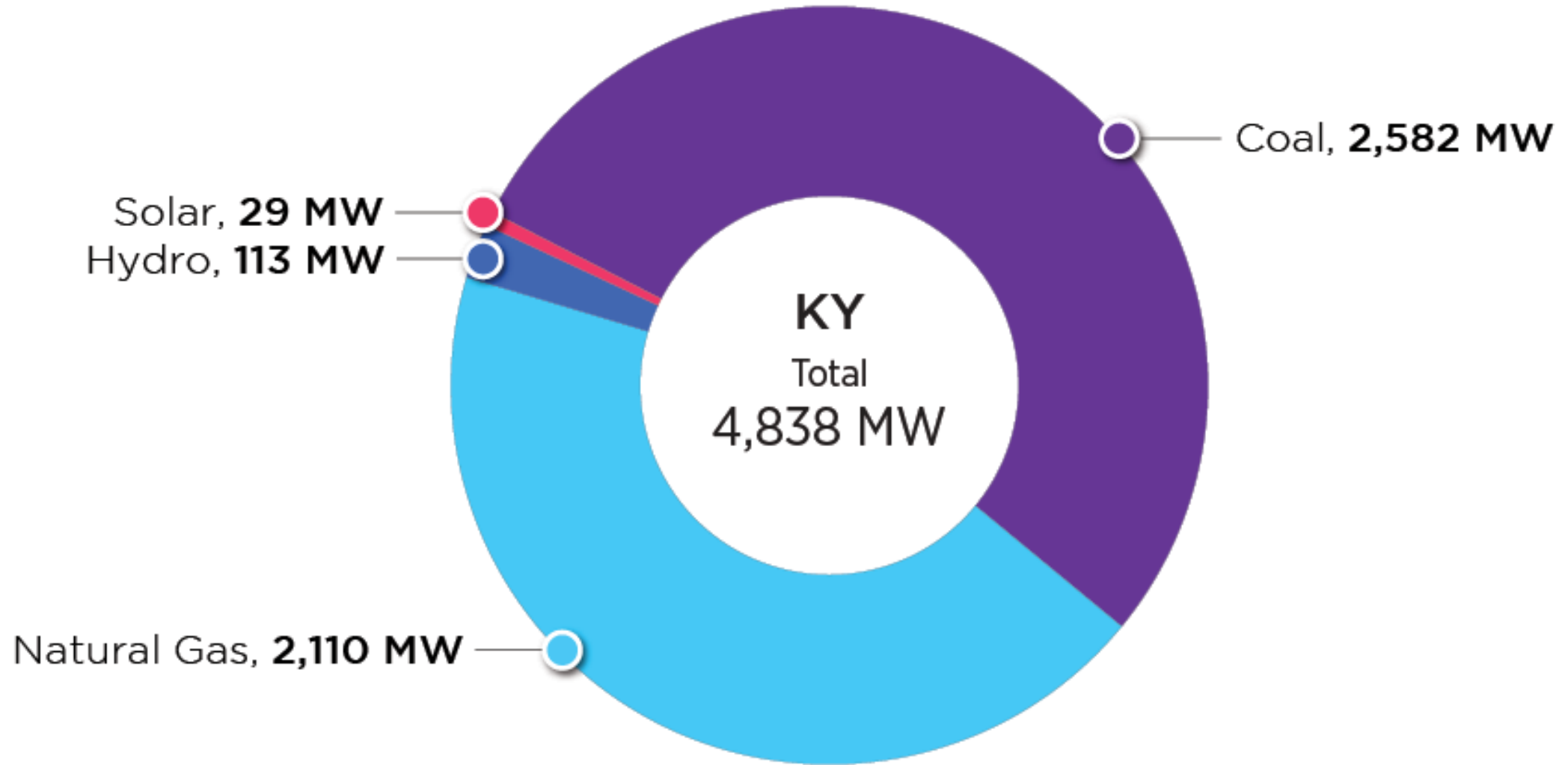
PJM Existing Installed Capacity Mix

(CIRs – as of Dec. 31, 2023)



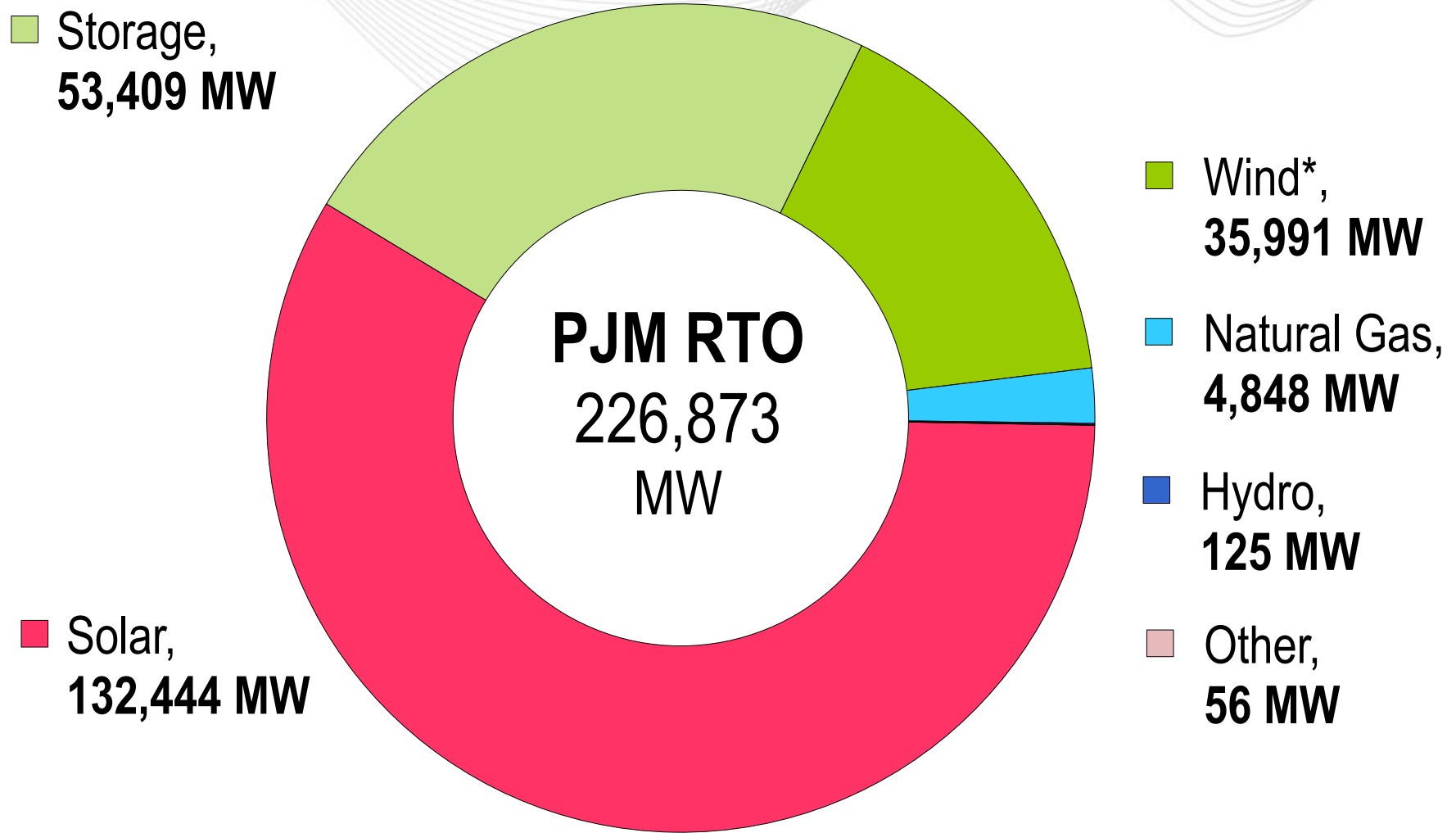
Kentucky – Existing Installed Capacity (MW) by Fuel Type

(Dec. 31, 2023)



PJM Queued Capacity (Nameplate) by Fuel Type

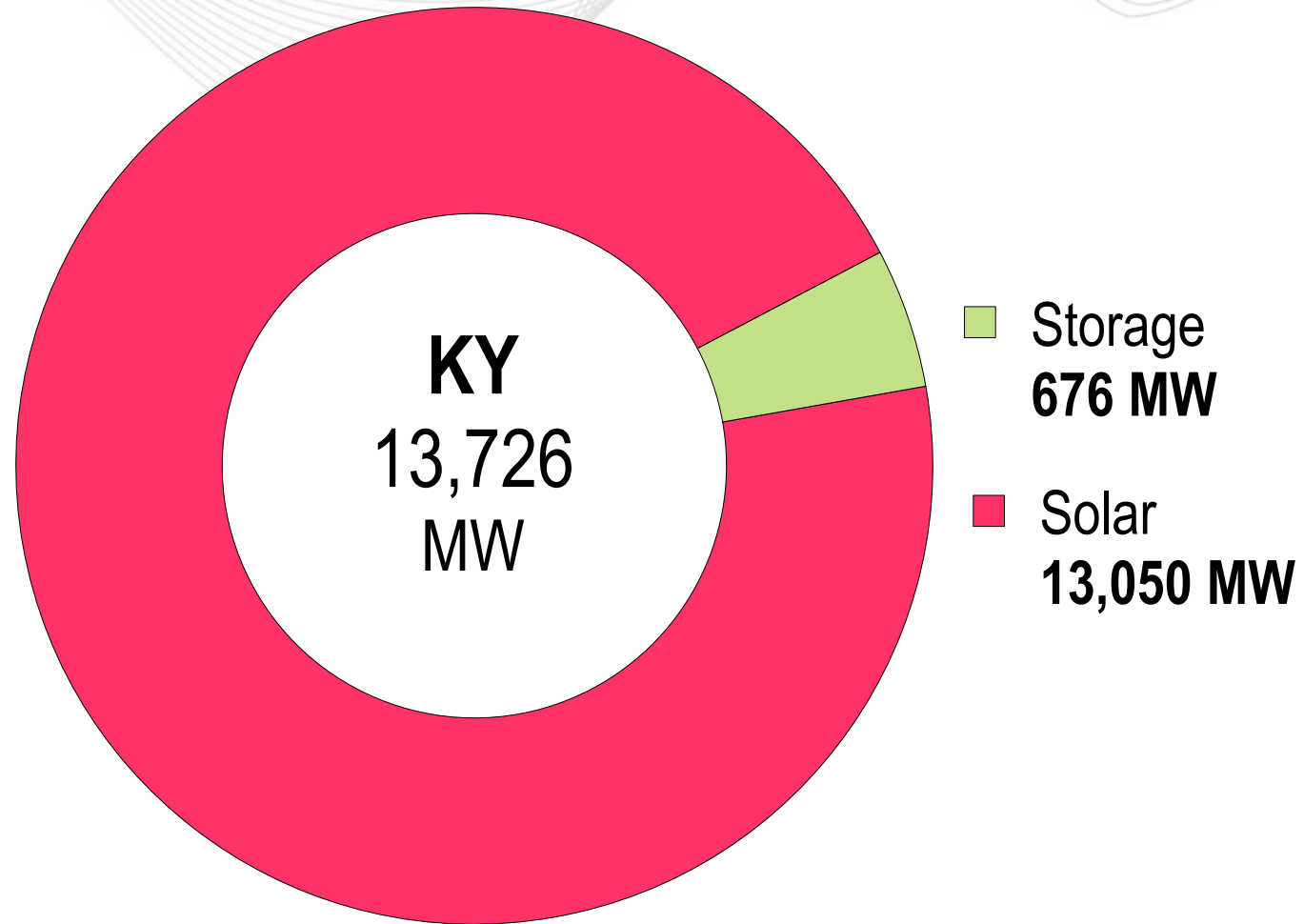
("Active" in the PJM Queue as of April 1, 2024)



*Wind includes both onshore and offshore wind

Kentucky Queued Capacity (Nameplate) by Fuel Type

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



Kentucky – 2023 Generator Deactivations

Kentucky had no generators deactivate or give a notice of deactivation in 2023.

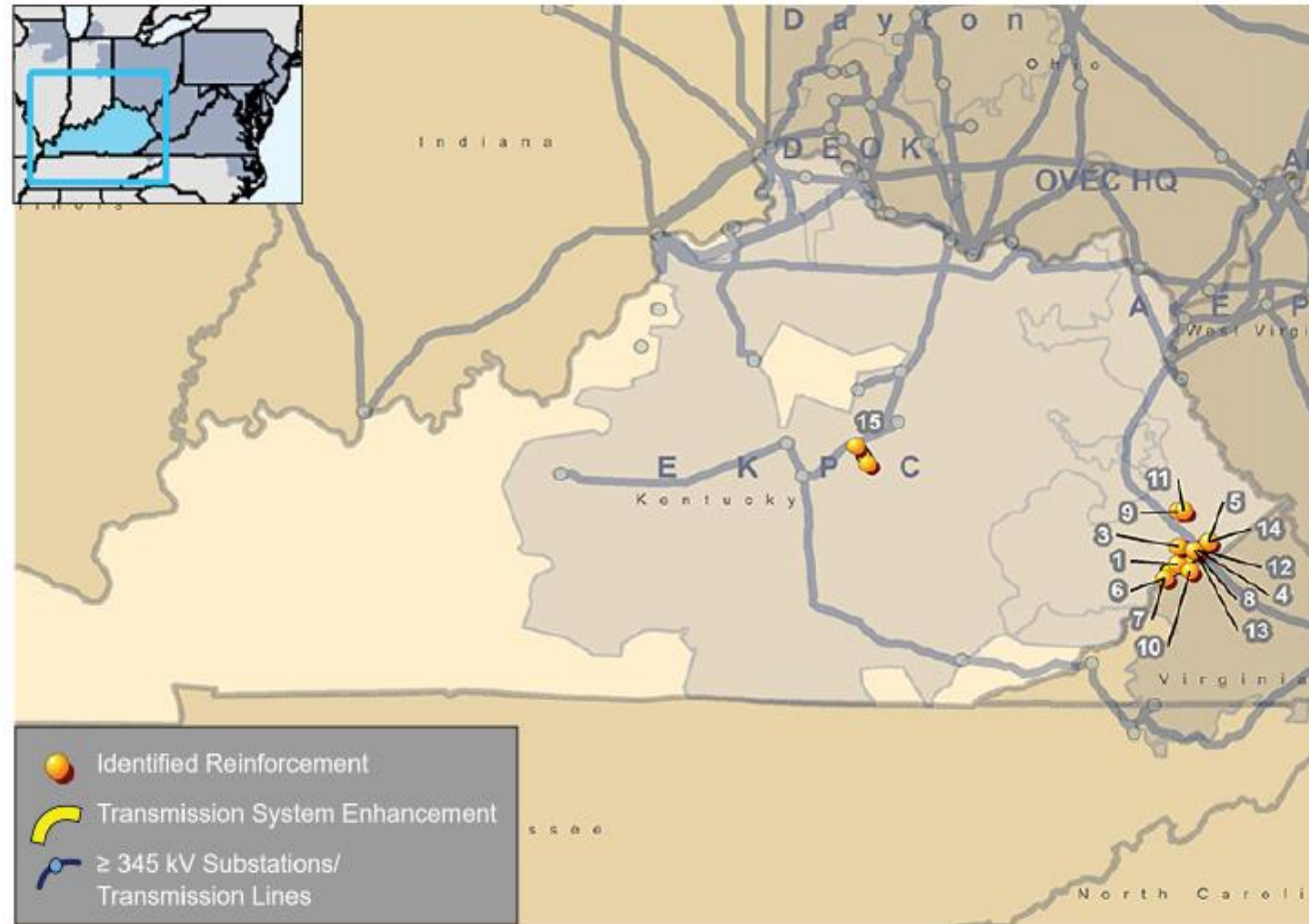
Planning

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.

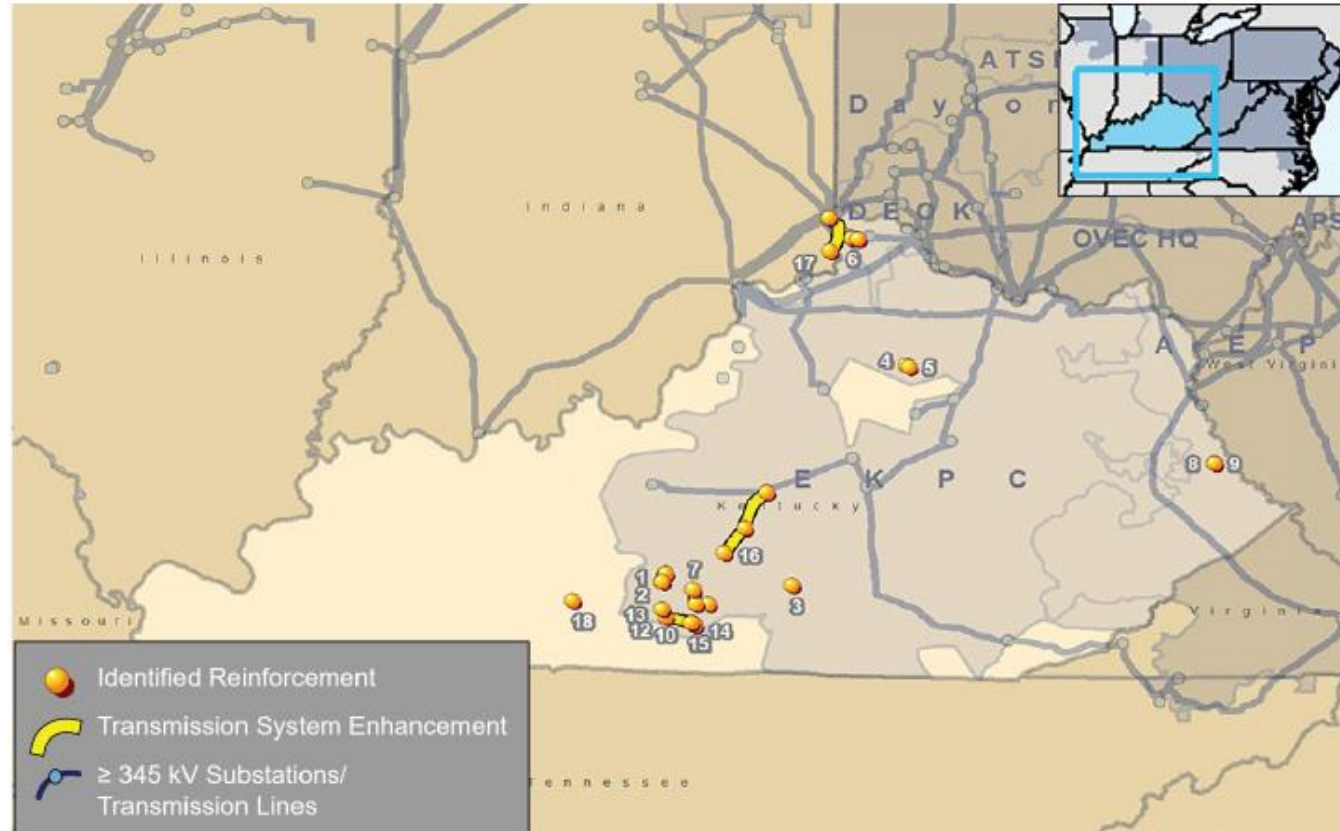
For a detailed list of each project shown on a state's project map, please see that state's section in the **2023 Annual RTEP Report** on PJM.com: <https://pjm.com/-/media/library/reports-notice/2023-rtep/2023-rtep-report.ashx>.

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>.



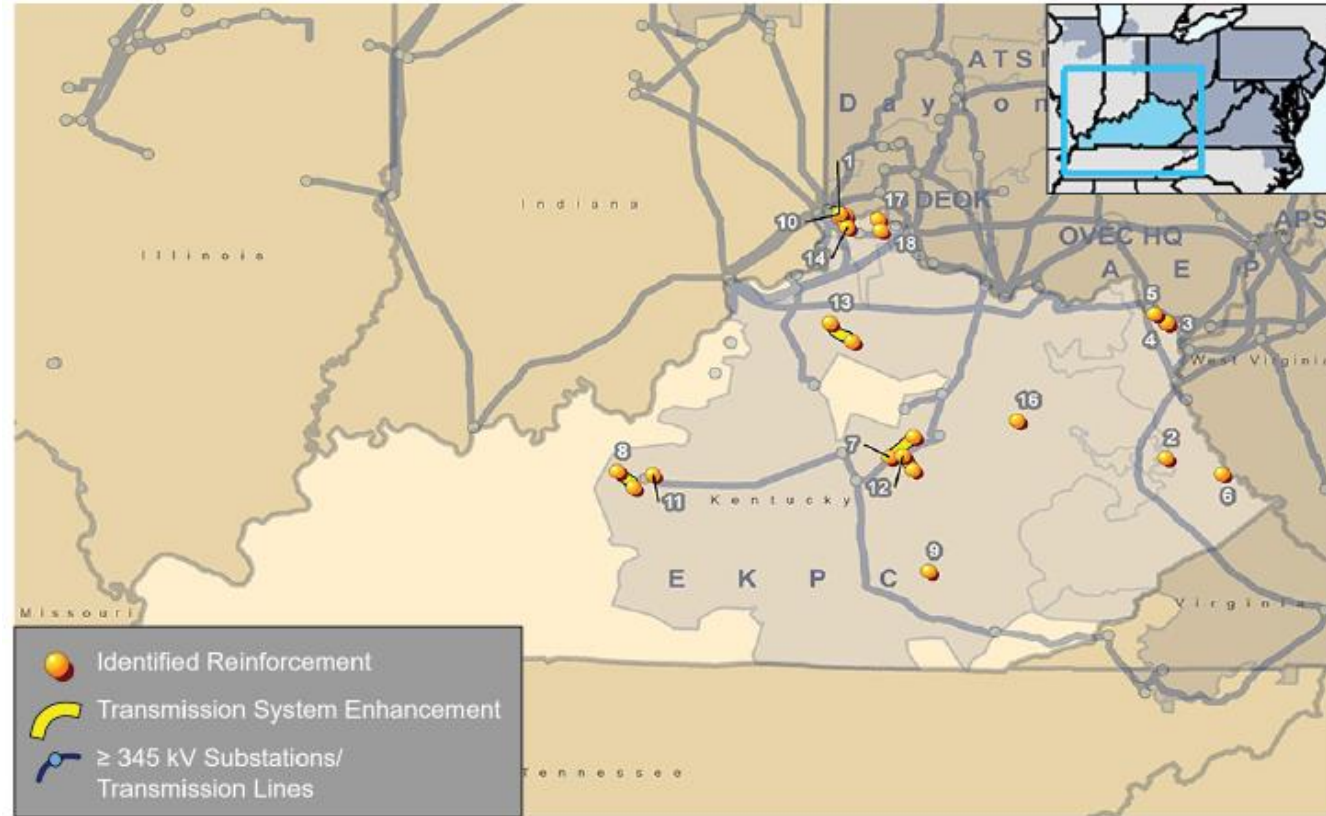
The 2023 RTEP has \$91.59 million in supplemental projects located in Kentucky.

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 \$19.21 million in network upgrades located in Kentucky.

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 \$104.02 million in network upgrades located in Kentucky.

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

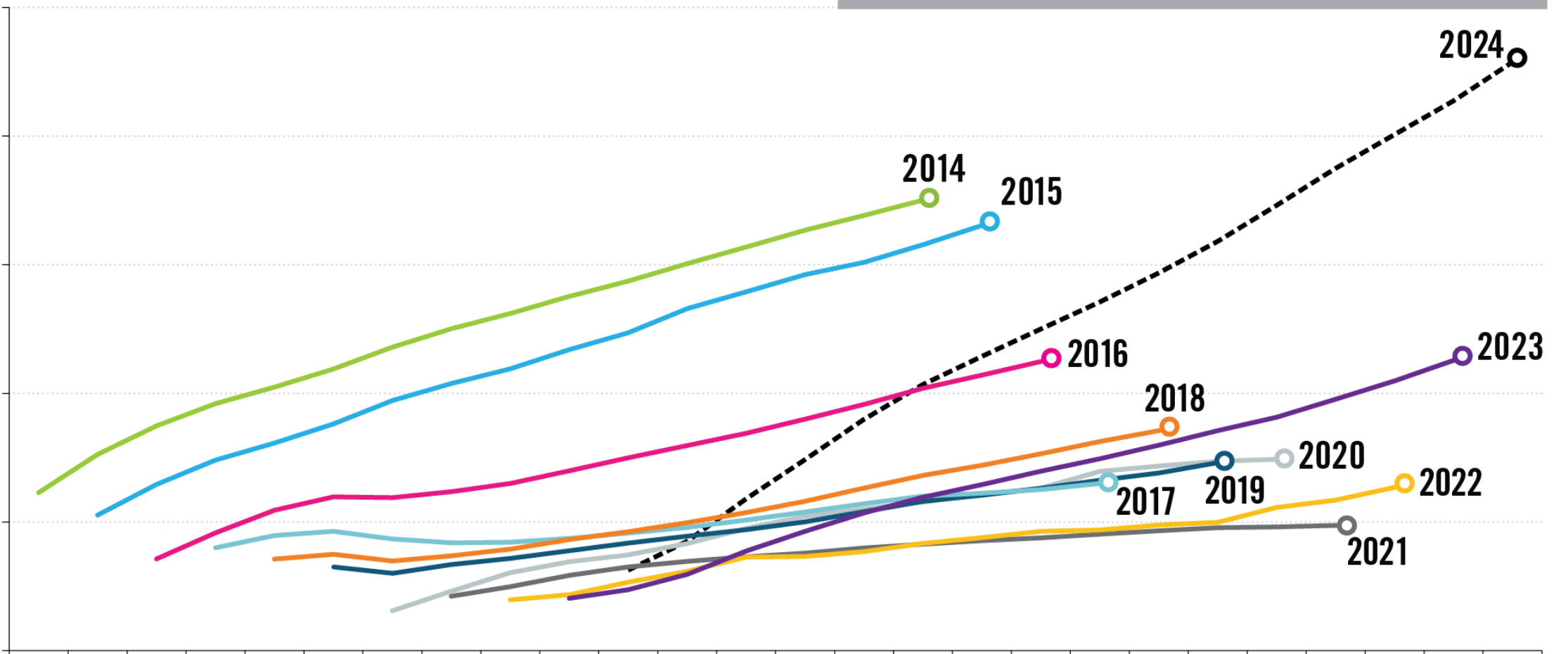
165,000

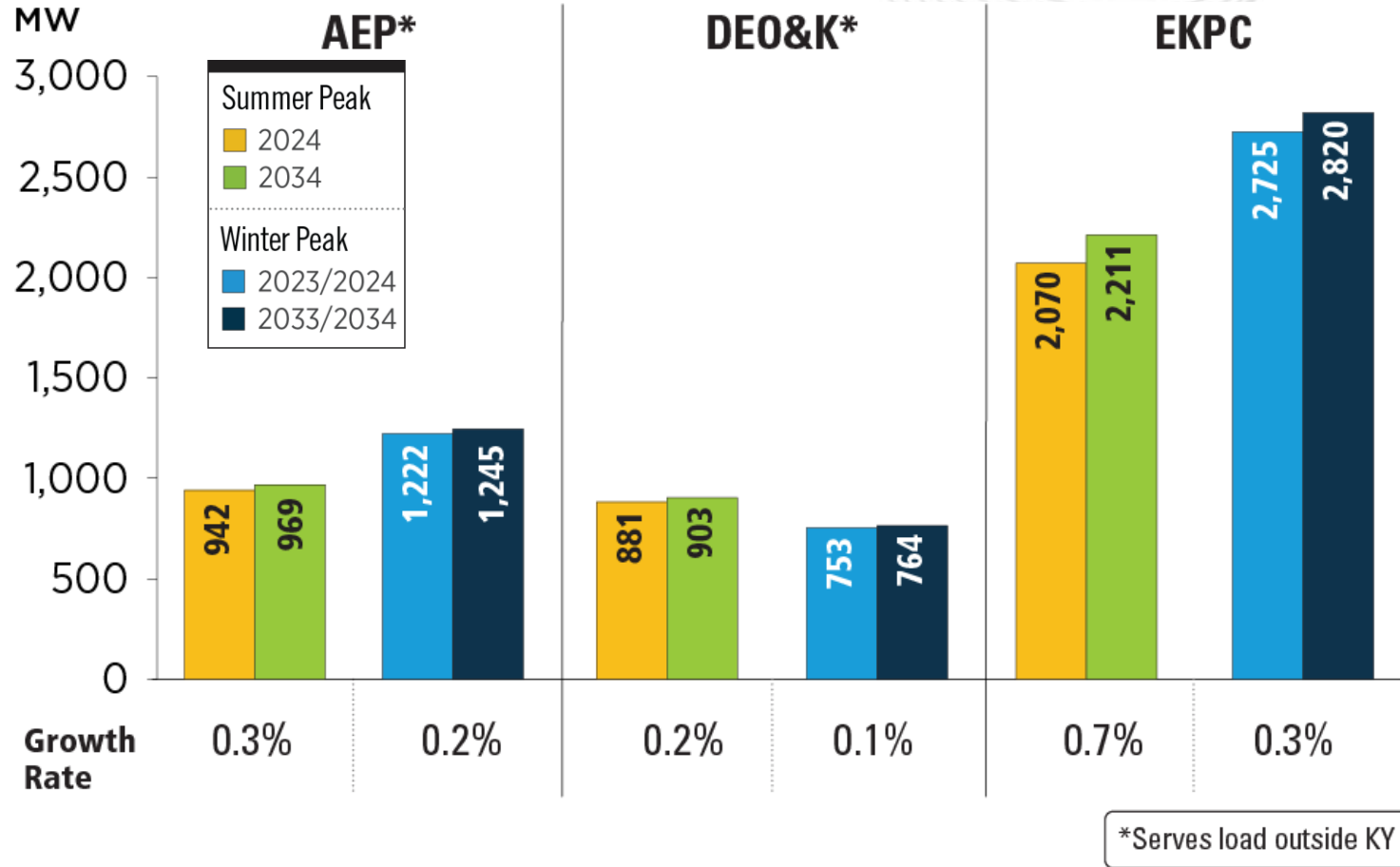
155,000

145,000

PJM RTO Summer Peak Demand Forecast

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



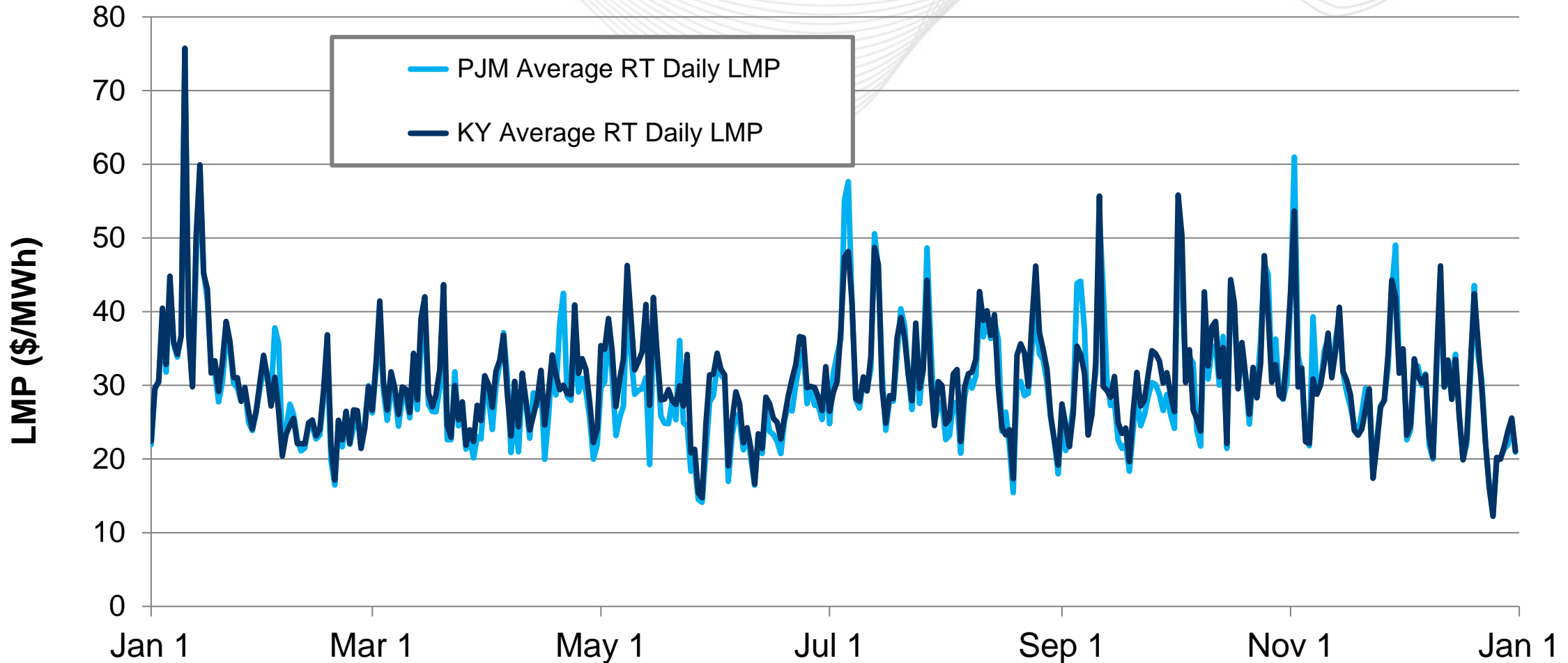


PJM RTO Summer Peak		PJM RTO Winter Peak	
2024	2034	2023/2024	2033/2034
151,247	176,822	134,659	163,069
MW	MW	MW	MW
Growth Rate 1.6%		Growth Rate 1.9%	

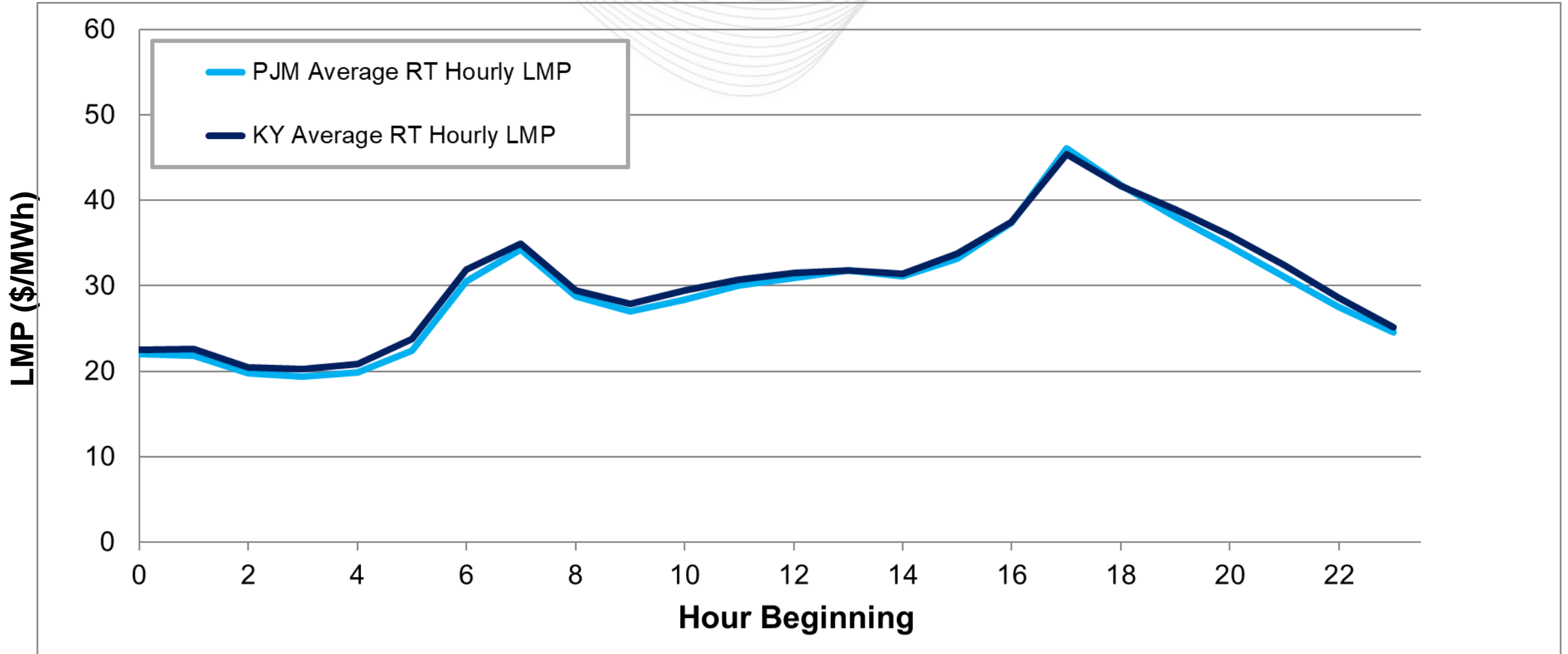
* PJM notes that AEP and Duke Energy serve load other than in Kentucky. The summer and winter peak megawatt values in this table each reflect an estimated amount of forecasted load to be served by each of those transmission owners solely in Kentucky. Estimated amounts were calculated based on the average share of each transmission owner's real-time summer and winter peak load located in Kentucky over the past five years.

Markets

Market Analysis

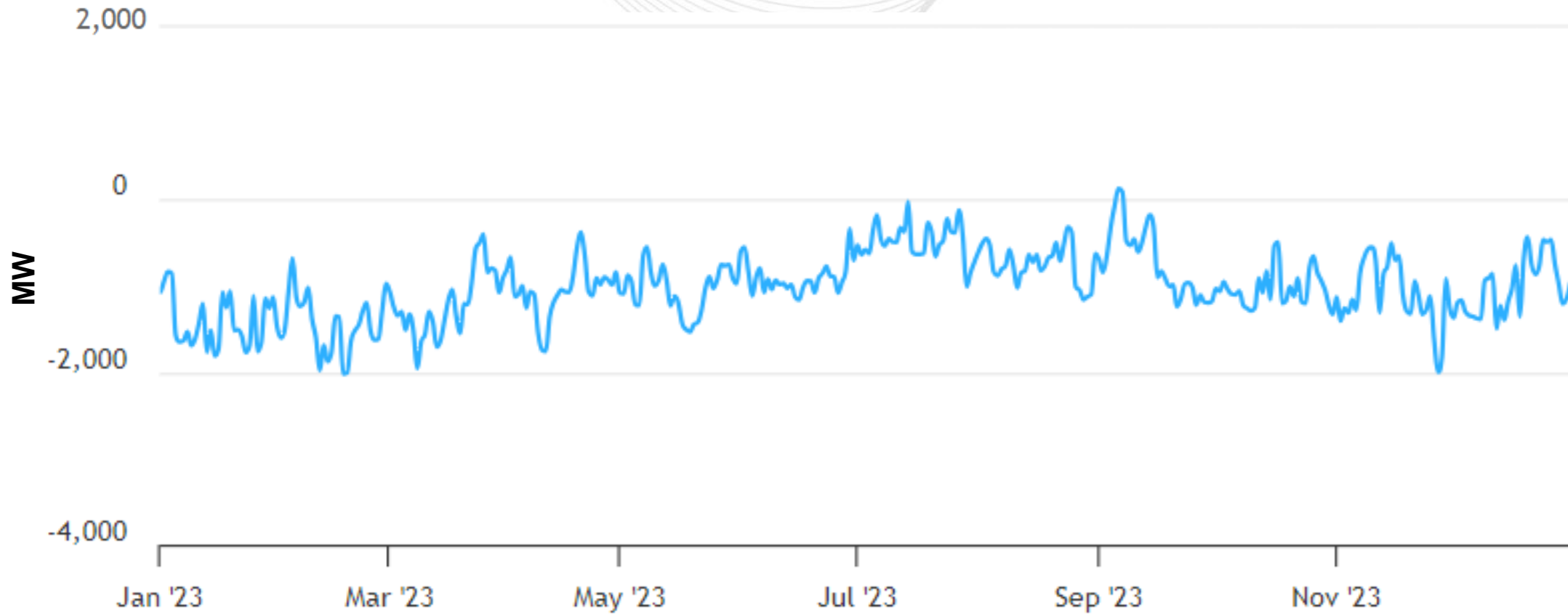


Kentucky's average hourly LMPs were consistent with the PJM average hourly LMP.



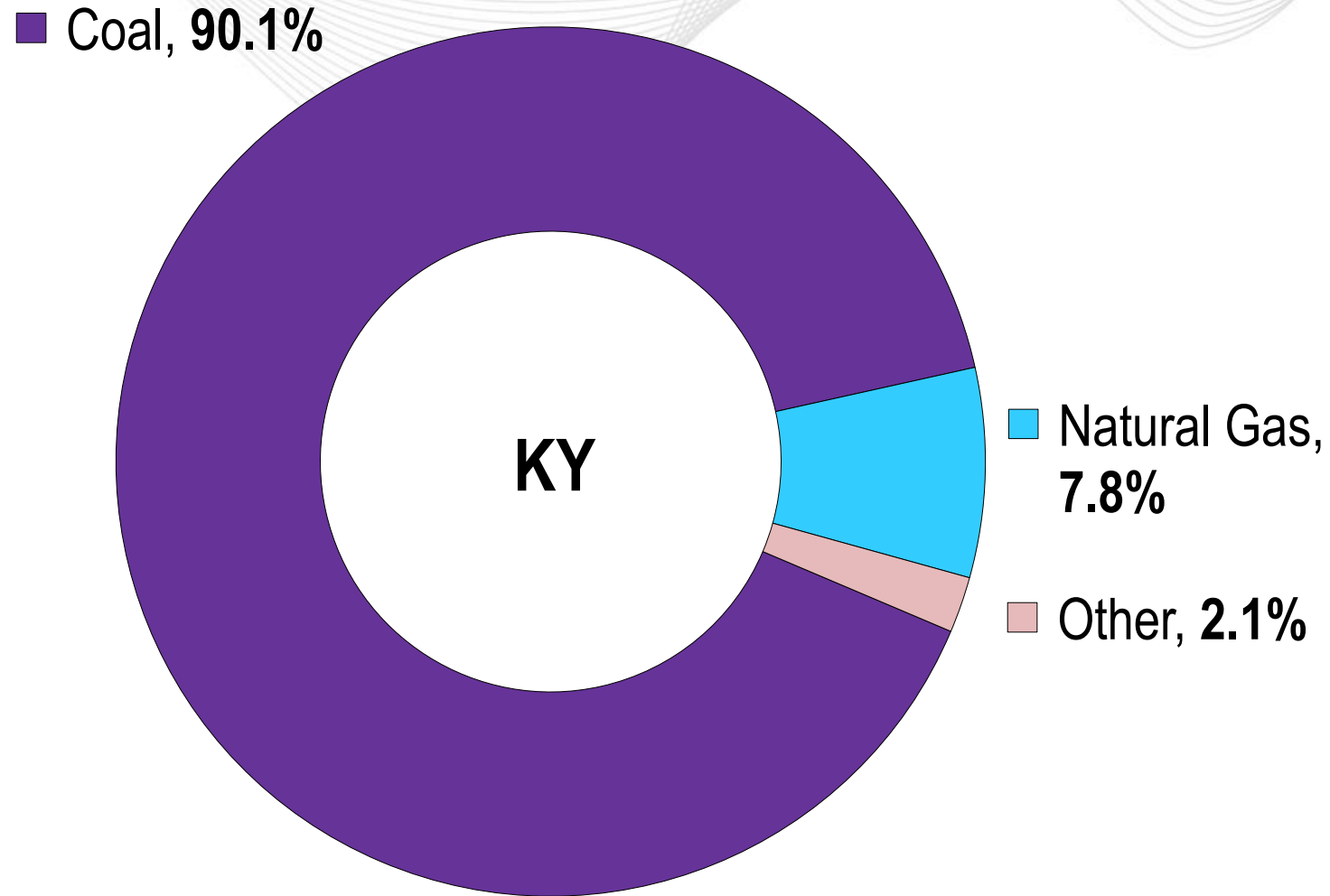
Kentucky – Net Energy Import/Export Trend

(Jan. 2023 – Dec. 2023)



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 (2023) and represents only generators within the PJM portion of Kentucky.

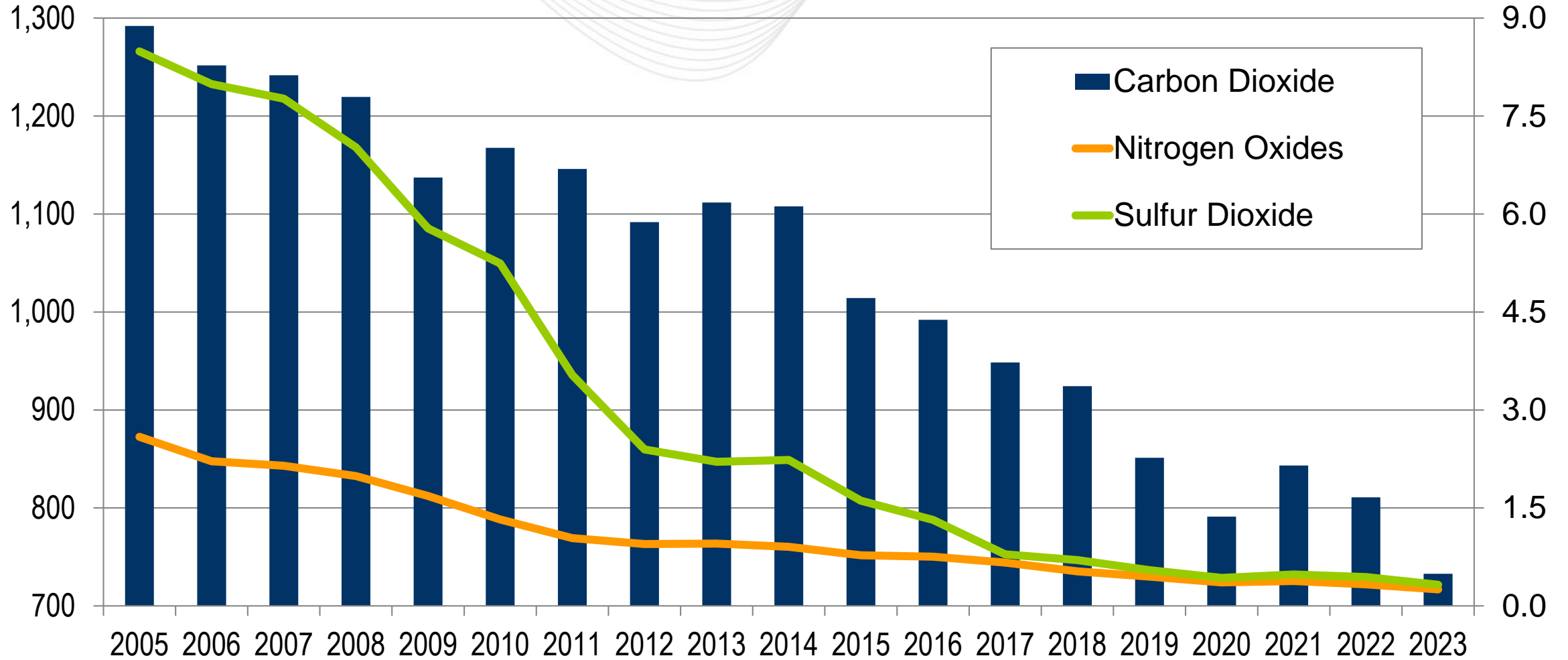


2005 – 2023 PJM Average Emissions

(March 2024)

CO₂
(lbs/MWh)

SO₂ and NO_x
(lbs/MWh)





Kentucky – Average Emissions (lbs/MWh)

(March 2024)

CO₂
(lbs/MWh)

SO₂ and NO_x
(lbs/MWh)

