



# 2021 Illinois State Infrastructure Report

(January 1, 2021 – December 31, 2021)

May 2022

This report reflects information for the portion of Illinois 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:** Natural gas represents approximately 40.7 percent of the total installed capacity in the Illinois service territory while nuclear represents approximately 39.8 percent. Across all of PJM, natural gas and nuclear account for approximately 44.2 and 17.5 percent of total capacity.
- **Interconnection Requests:** Solar represents 46.2 percent of new interconnection requests in Illinois, while natural gas represents approximately 26.8 percent of new requests.
- **Deactivations:** 1,202 MW in Illinois gave notification of deactivation in 2021.
- **RTEP 2021:** Illinois' 2021 RTEP project total represents \$53 million in investment. This total includes network projects whose cost is borne by the interconnecting customer.

- **Load Forecast:** Illinois' summer peak load within the ComEd zone is projected to decrease by 0.3 percent annually over the next ten years.
- **2022/23 Capacity Market:** 20,011 MW in Illinois cleared in the 2022/23 Base Residual Auction.
- **1/1/21 – 12/31/21 Market Performance:** Illinois's average hourly LMPs were lower than the PJM average hourly LMP.
- **Emissions:** Illinois' average CO2 emissions increased in 2021 compared to 2020 levels.



The PJM service area in Illinois is the ComEd zone and is represented by the shaded portion of the map.

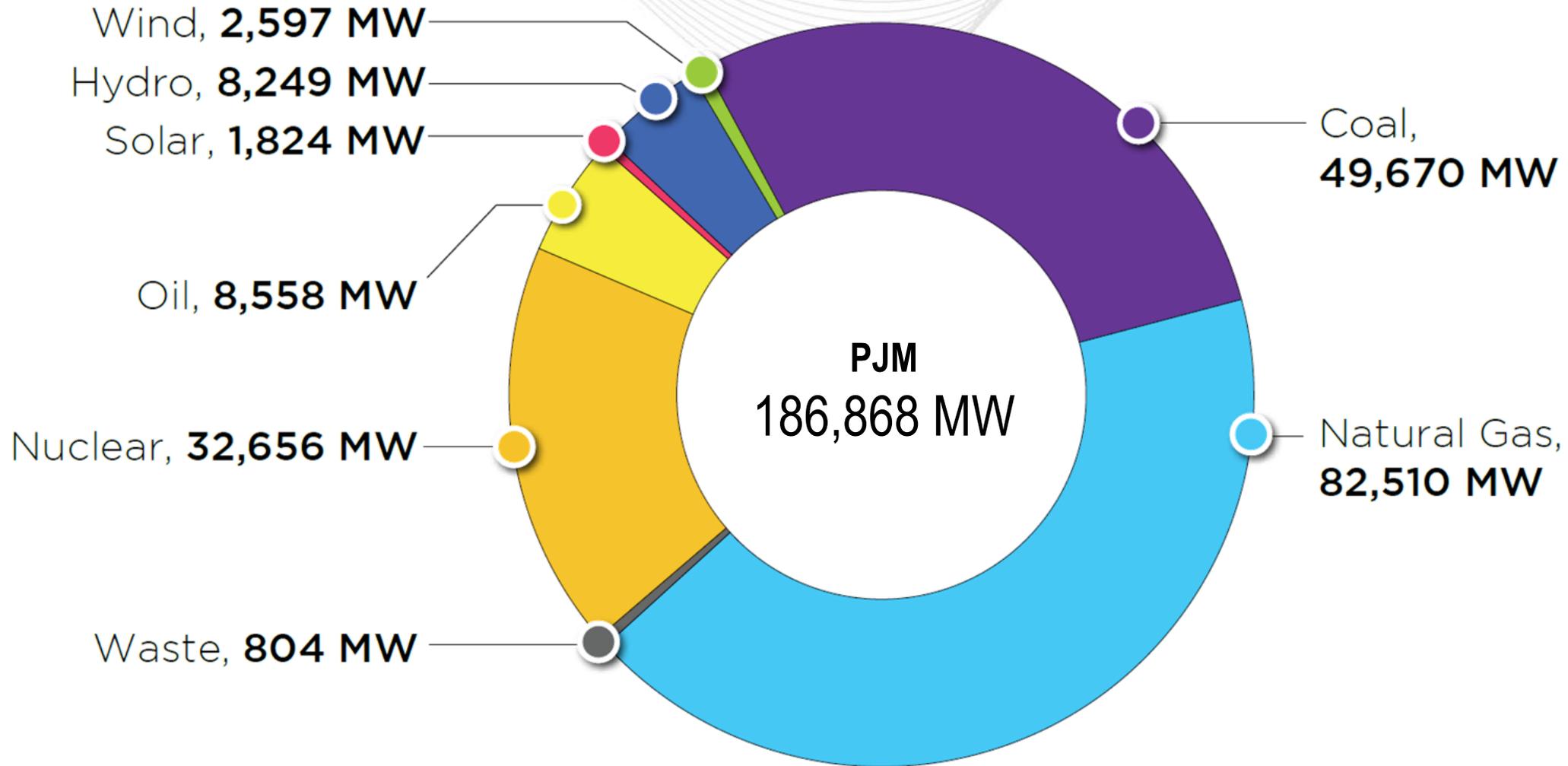
PJM operates transmission lines that extend beyond the service territory.

# Planning

## Generation Portfolio Analysis

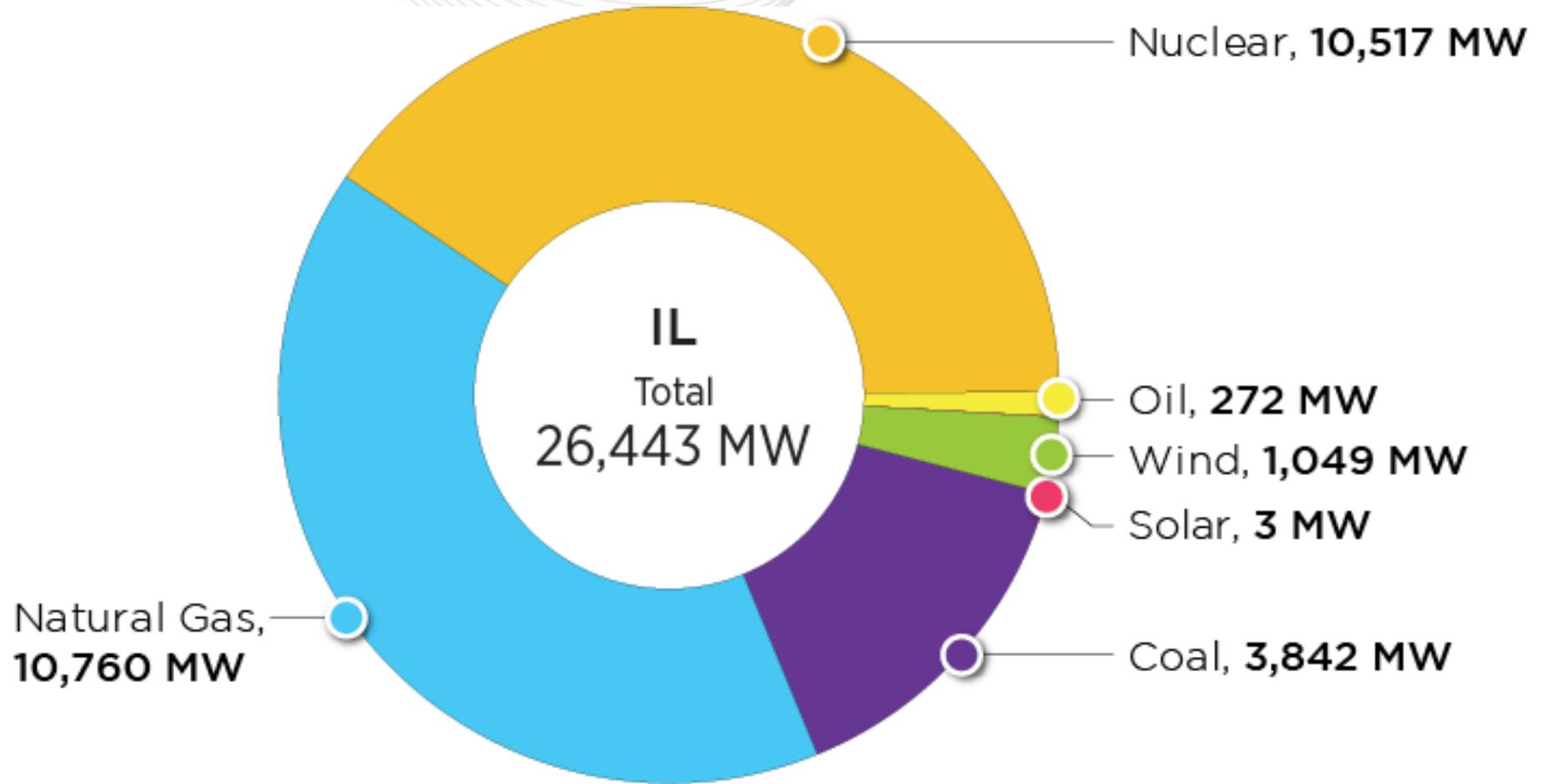
# PJM – Existing Installed Capacity

(CIRs – as of Dec. 31, 2021)



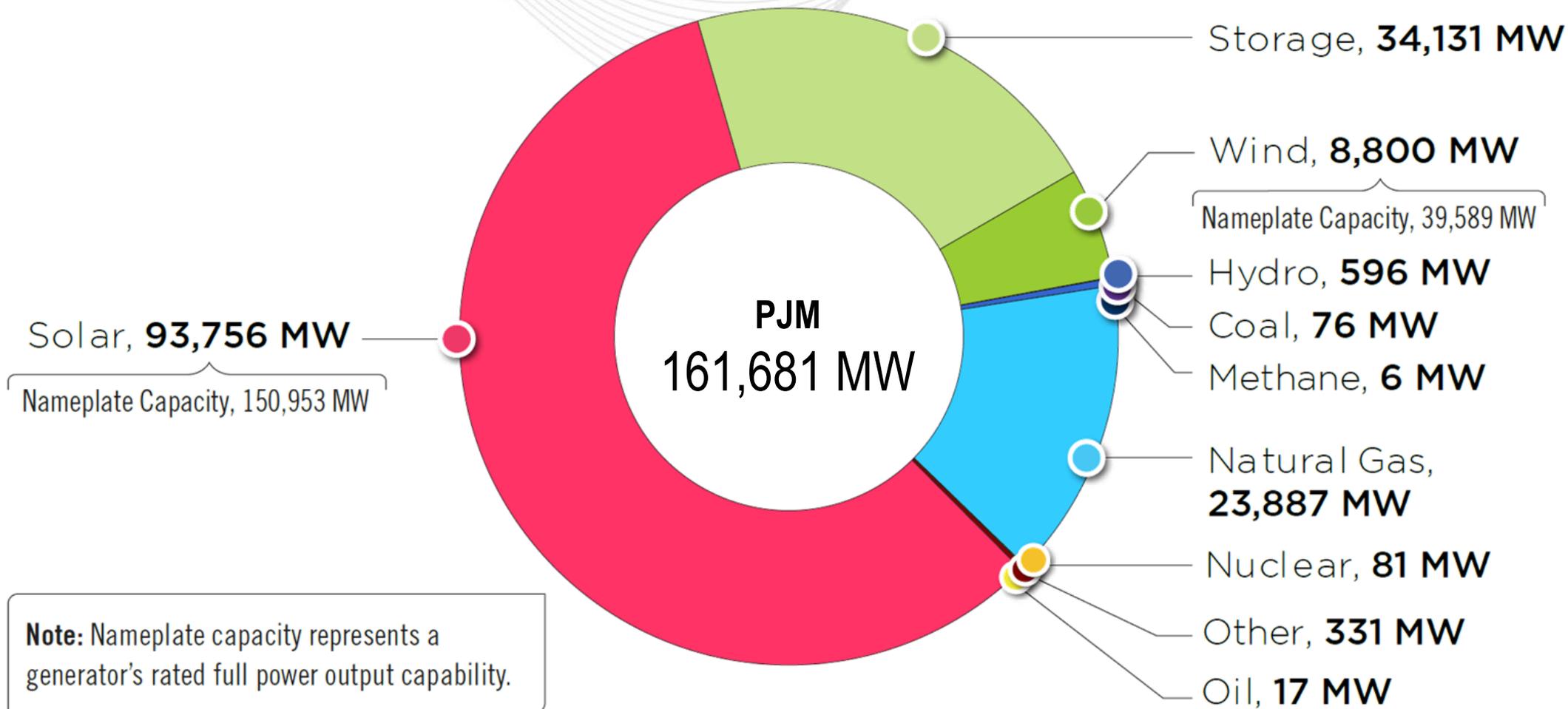
# Illinois – Existing Installed Capacity

(CIRs – as of Dec. 31, 2021)



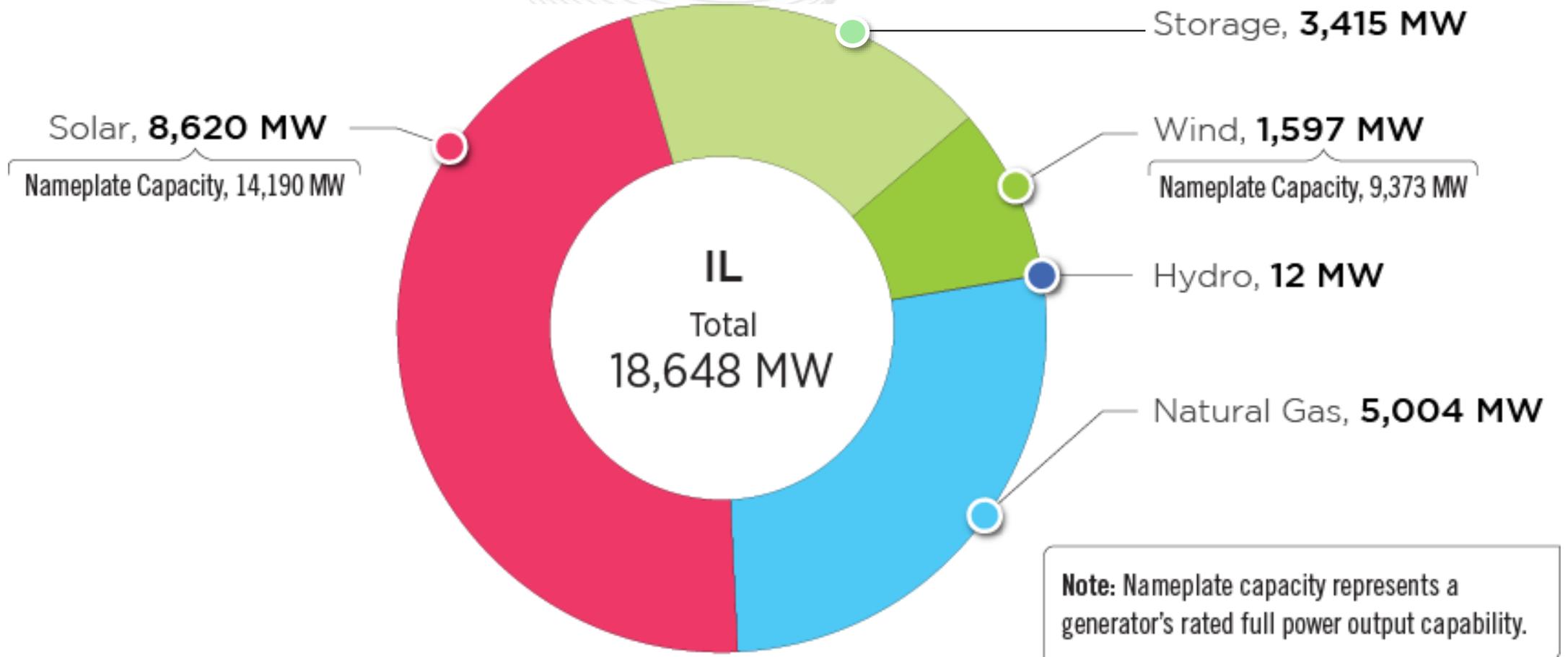
# PJM – Queued Capacity (MW) by Fuel Type

(Requested CIRs – as of Dec. 31, 2021)



# Illinois – Queued Capacity (MW) by Fuel Type

(Requested CIRs – as of Dec. 31, 2021)





# Illinois – Historical Interconnection Requests by Fuel Type

(as of Dec. 31, 2021)

		In Queue						Complete				Grand Total	
		Active		Suspended		Under Construction		In Service		Withdrawn		Grand Total	
		Projects	Capacity (MW)	Projects	Capacity (MW)	Projects	Capacity (MW)	Projects	Capacity (MW)	Projects	Capacity (MW)	Projects	Capacity (MW)
Non-Renewable	Coal	0	0.0	0	0.0	0	0.0	0	0.0	5	3,652.0	5	3,652.0
	Diesel	0	0.0	0	0.0	0	0.0	2	22.0	0	0.0	2	22.0
	Natural Gas	10	1,810.6	2	450.0	10	2,742.9	21	1,703.6	21	8,908.3	64	15,615.4
	Nuclear	0	0.0	0	0.0	0	0.0	10	385.8	5	782.0	15	1,167.8
	Other	1	0.0	0	0.0	0	0.0	0	0.0	6	0.0	7	0.0
	Storage	47	3,415.1	0	0.0	0	0.0	8	0.0	29	1,139.7	84	4,554.8
Renewable	Biomass	0	0.0	0	0.0	0	0.0	0	0.0	3	90.0	3	90.0
	Hydro	0	0.0	0	0.0	1	12.1	0	0.0	3	14.9	4	27.0
	Methane	0	0.0	0	0.0	0	0.0	3	35.0	14	63.9	17	98.9
	Solar	92	8,562.6	0	0.0	4	57.1	1	3.4	59	2,408.3	156	11,031.4
	Wind	45	1,570.6	0	0.0	1	26.0	31	847.7	111	2,922.4	188	5,366.7
	<b>Grand Total</b>	<b>195</b>	<b>15,359.0</b>	<b>2</b>	<b>450.0</b>	<b>16</b>	<b>2,838.1</b>	<b>76</b>	<b>2,997.5</b>	<b>256</b>	<b>19,981.5</b>	<b>545</b>	<b>41,626.1</b>

**Note:** The "Under Construction" column includes both "Engineering and Procurement" and "Under Construction" project statuses.

# Illinois – Progression History of Interconnection Requests



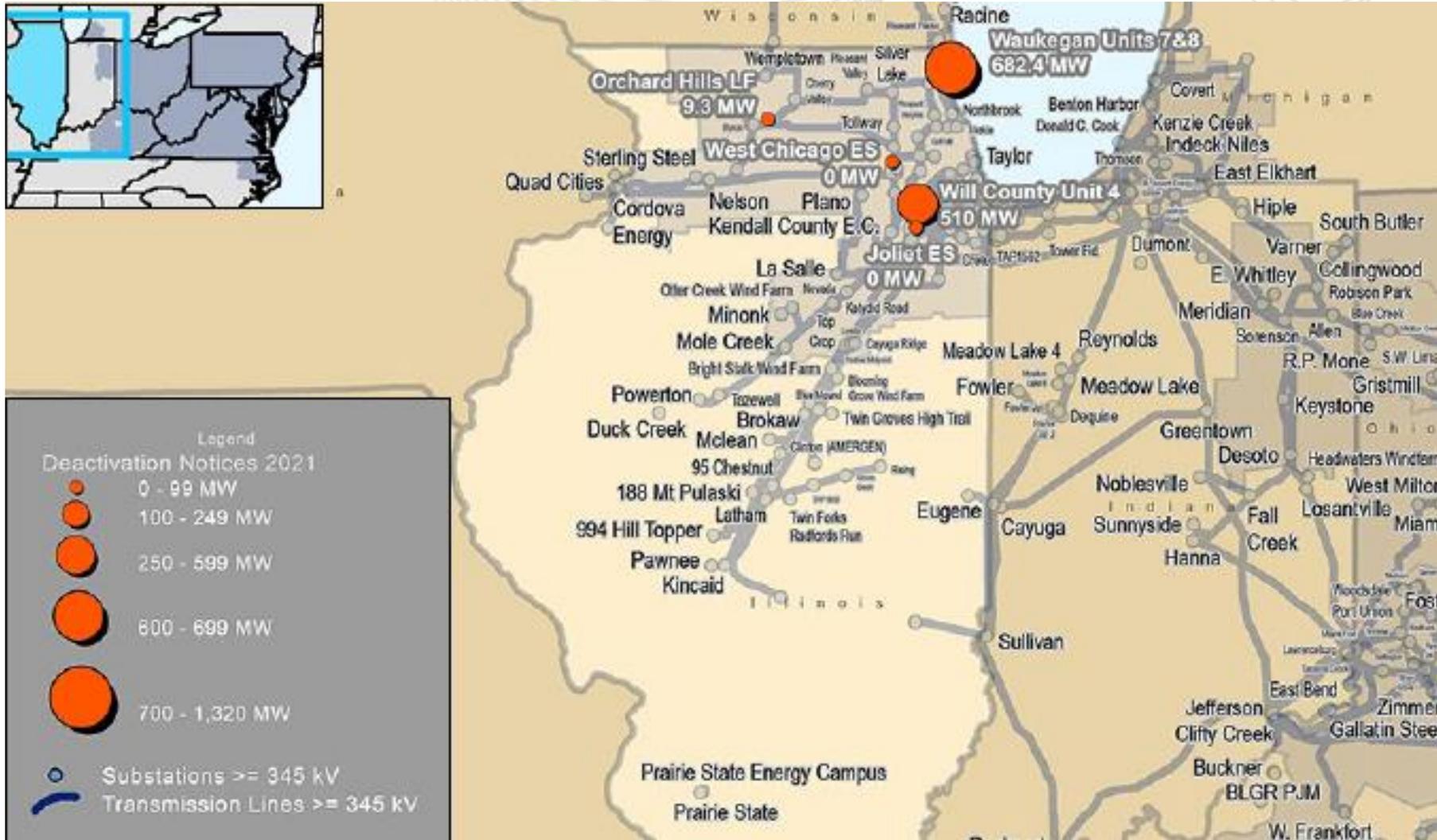
Percentage of planned capacity and projects that have reached commercial operation

- 11.8%** Requested capacity megawatts
- 22.9%** Requested projects

		Capacity	Nameplate
Projects withdrawn after final agreement	<b>8</b> Interconnection Service Agreements	376 MW	1,678 MW
	<b>5</b> Wholesale Market Participation Agreements	14 MW	25 MW

*This graphic shows the final state of generation submitted to the PJM queue that completed the study phase as of Dec. 31, 2021, meaning the generation reached in-service operation, began construction, or was suspended or withdrawn. It does not include projects considered active in the queue as of Dec. 31, 2021.*

# Illinois – Generation Deactivation Notifications Received in 2021





# Illinois – Generation Deactivation Notifications Received in 2021

Unit	TO Zone	Fuel Type	Request Received to Deactivate	Actual or Projected Deactivation Date	Age (Years)	Capacity (MW)
Orchard Hills LF	ComEd	Methane	12/30/2021	3/31/2022	5	9.3
Joliet Energy Storage		Battery	11/9/2021	2/8/2022	6	0
West Chicago Energy Storage					6	0
Will County 4					58	510
Waukegan 8		Coal	6/30/2021	5/31/2022	59	354.4
Waukegan 7					63	328

# Planning

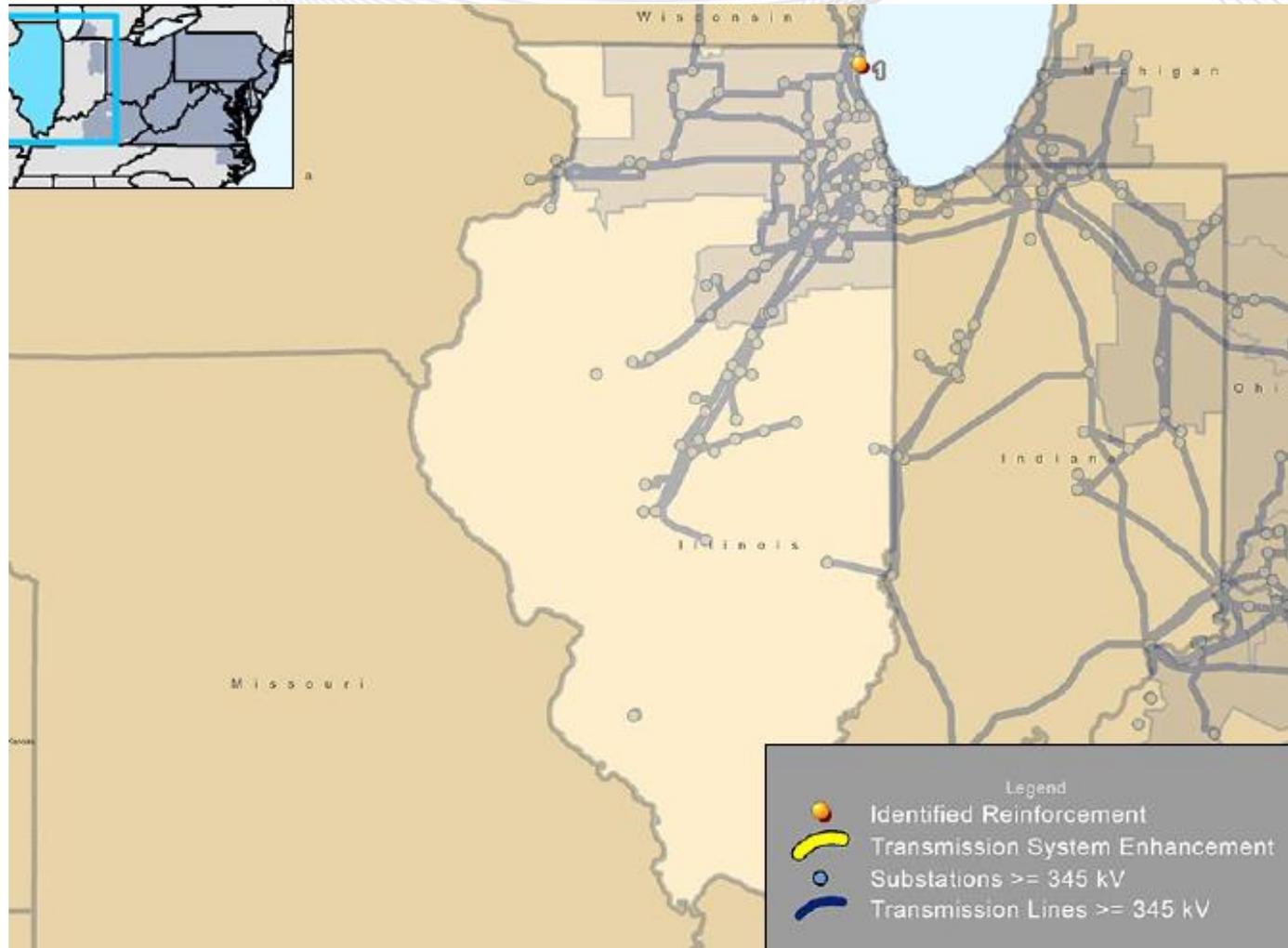
## Transmission Infrastructure Analysis



Please note that PJM is now listing all transmission projects in its Annual RTEP and state infrastructure reports, beginning with this year's 2021 Annual RTEP. In previous years only projects above a \$10 million threshold were listed in the Annual RTEP Report and projects above a \$5 million threshold were listed in the state infrastructure reports. This change may increase the amount of projects listed in these reports going forward now that smaller projects below the previous \$5 million cutoff are being included.

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).

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



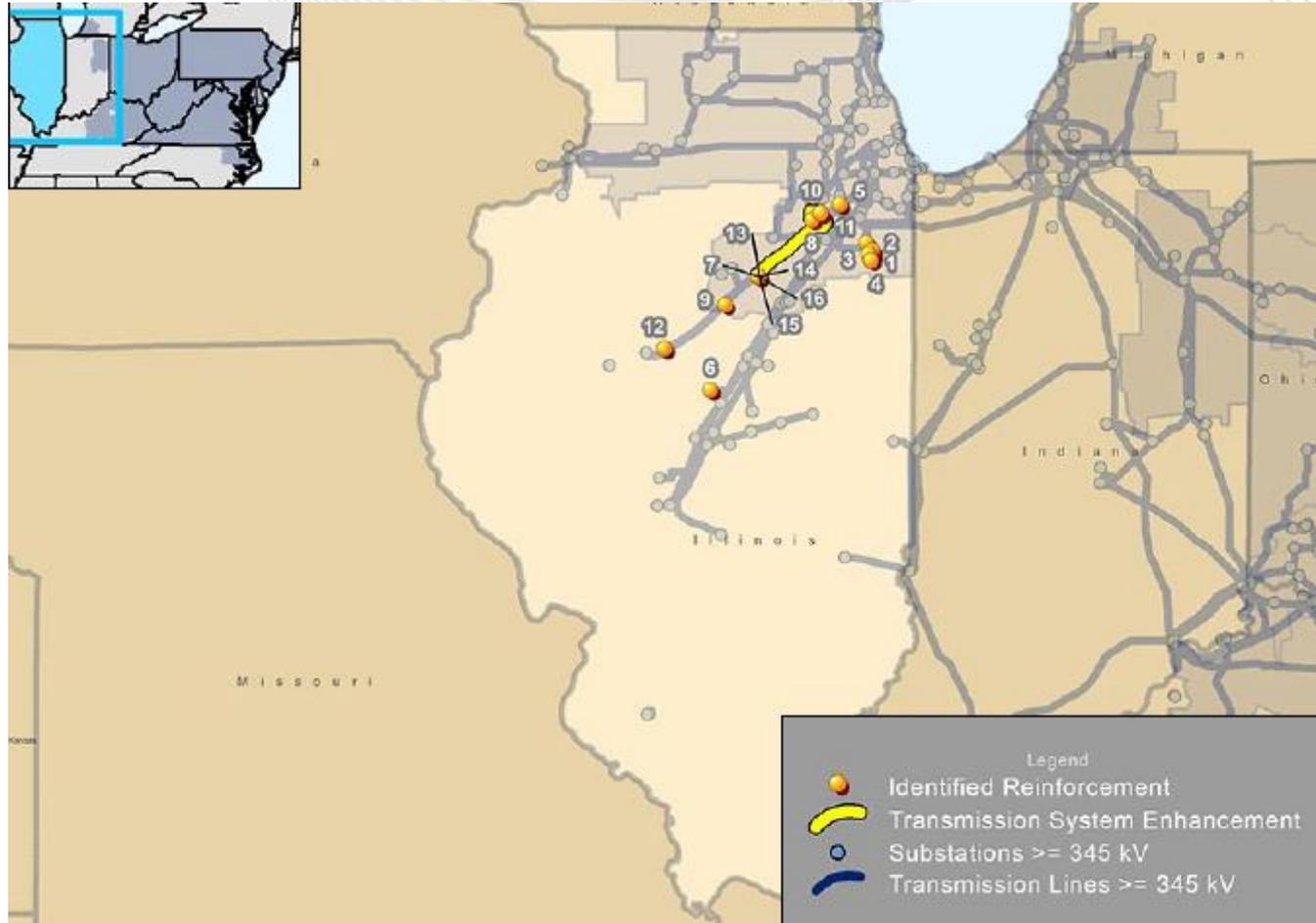
Note: Baseline upgrades are those that resolve a system reliability criteria violation.



# Illinois – RTEP Baseline Projects

Map ID	Project	Description	Required In-Service Date	Project Cost (\$M)	TO Zone	TEAC Date
1	b3317	Modify backup relay clearing times at the 138 kV STA16 Waukegan station.	6/1/2023	\$0.26	ComEd	5/21/2021

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



Note: Network upgrades 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.



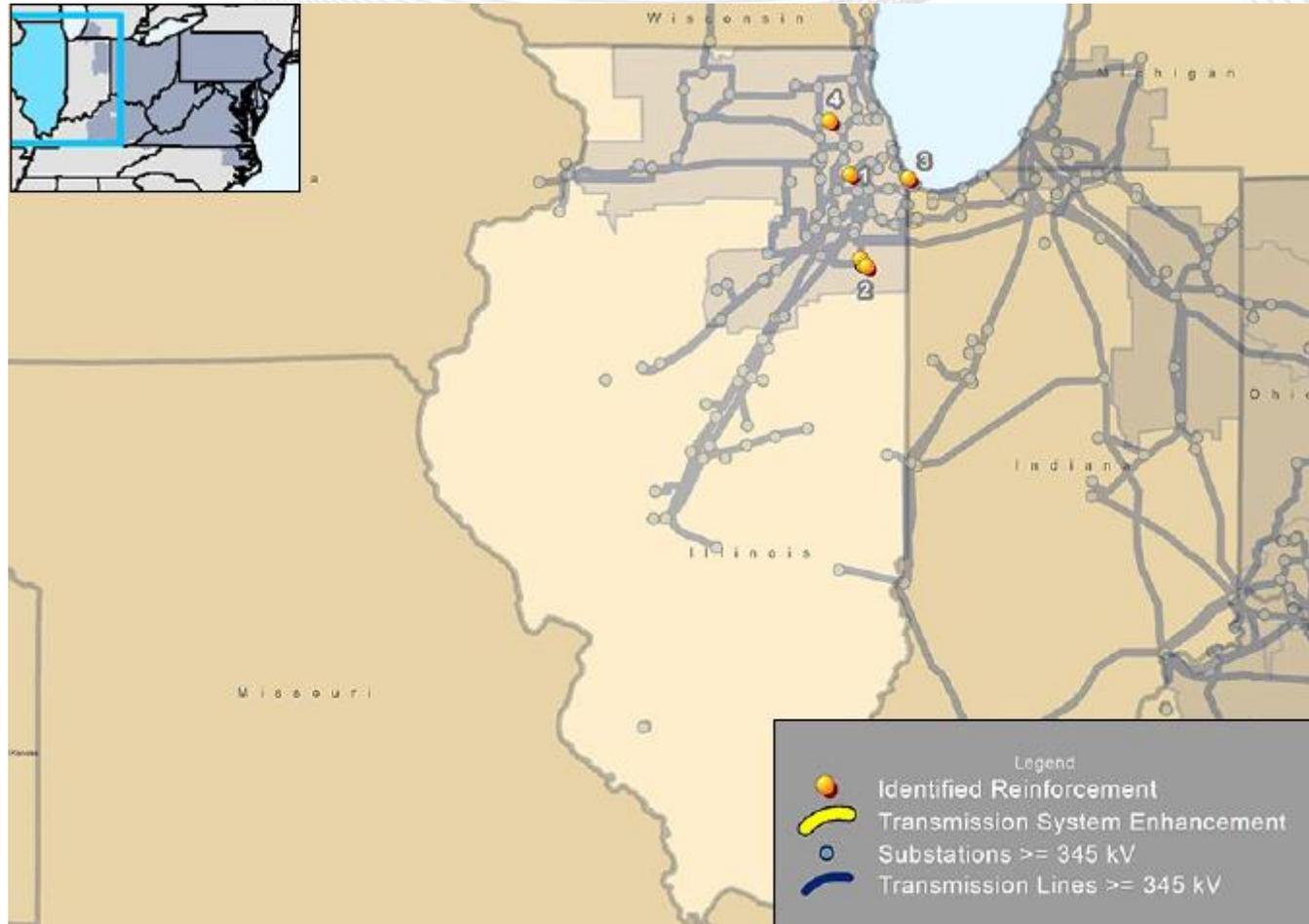
# Illinois – RTEP Network Projects

Map ID	Project	Description	Generation	Required In-Service Date	Project Cost (\$M)	TO Zone	TEAC Date
1	n1830	Oversee building the interconnection substation Kensington Ave. TSS 199.	S36	12/31/2011	\$0.55	ComEd	11/30/2021
2	n1831	Kensington Ave. TSS199 – Install 138 kV transmission line tie in.			\$0.11		
3	n1832.1	Perform relay and SCADA modifications at Davis Creek TSS 86.			\$0.36		
	n1832.2	Perform relay and SCADA modifications at Bradley TSS 70.			\$0.60		
	n1832.3	Perform relay and SCADA modifications at Kankakee TSS 157.			\$0.14		
4	n1835	Perform relay modifications at TSS 199 Kensington Ave. substation.	S37	12/31/2016	\$0.29		
5	n6025	Perform expansion of TSS 900 Elwood to accommodate AC1-204 attachment.	AC1-204	6/1/2022	\$11.45		



# Illinois – RTEP Network Projects

Map ID	Project	Description	Generation	Required In-Service Date	Project Cost (\$M)	TO Zone	TEAC Date
6	n6306	Install line terminal and metering at TSS92 McLean.	AB2-047	6/30/2021	\$0.50	ComEd	11/30/2021
	n6307	Install breaker for L91305 at TSS92 McLean.			\$2.00		
7	n6391	Consider option to build oversight at TSS 939 Mulberry and TSS924 Three Rivers.	AB1-122	2/1/2022	\$4.24		
8	n6392	Install fiber optics cable 13.1 miles TSS 939 Mulberry to station 23 Collins.			\$2.00		
9	n6393	Modify 93913 relaying at TSS 908 Mole Creek.			\$0.22		
10	n6394	Modify 1202 line relaying station 12 Dresden.			\$0.21		
11	n6395	Modify 1227 line relaying station 12 Dresden.			\$0.21		
12	n6936	Modify 93915 relaying at Tazewell.			\$0.09		
13	n6397	Modify 1202 tie in at TSS 939 Mulberry.			\$0.68		
14	n6398	Modify 1227 tie in at TSS 939 Mulberry.			\$0.68		
15	n6399	Modify 93913 tie in at TSS 939 Mulberry.			\$0.68		
16	n6400	Modify 93915 tie in at TSS 939 Mulberry.			\$0.68		



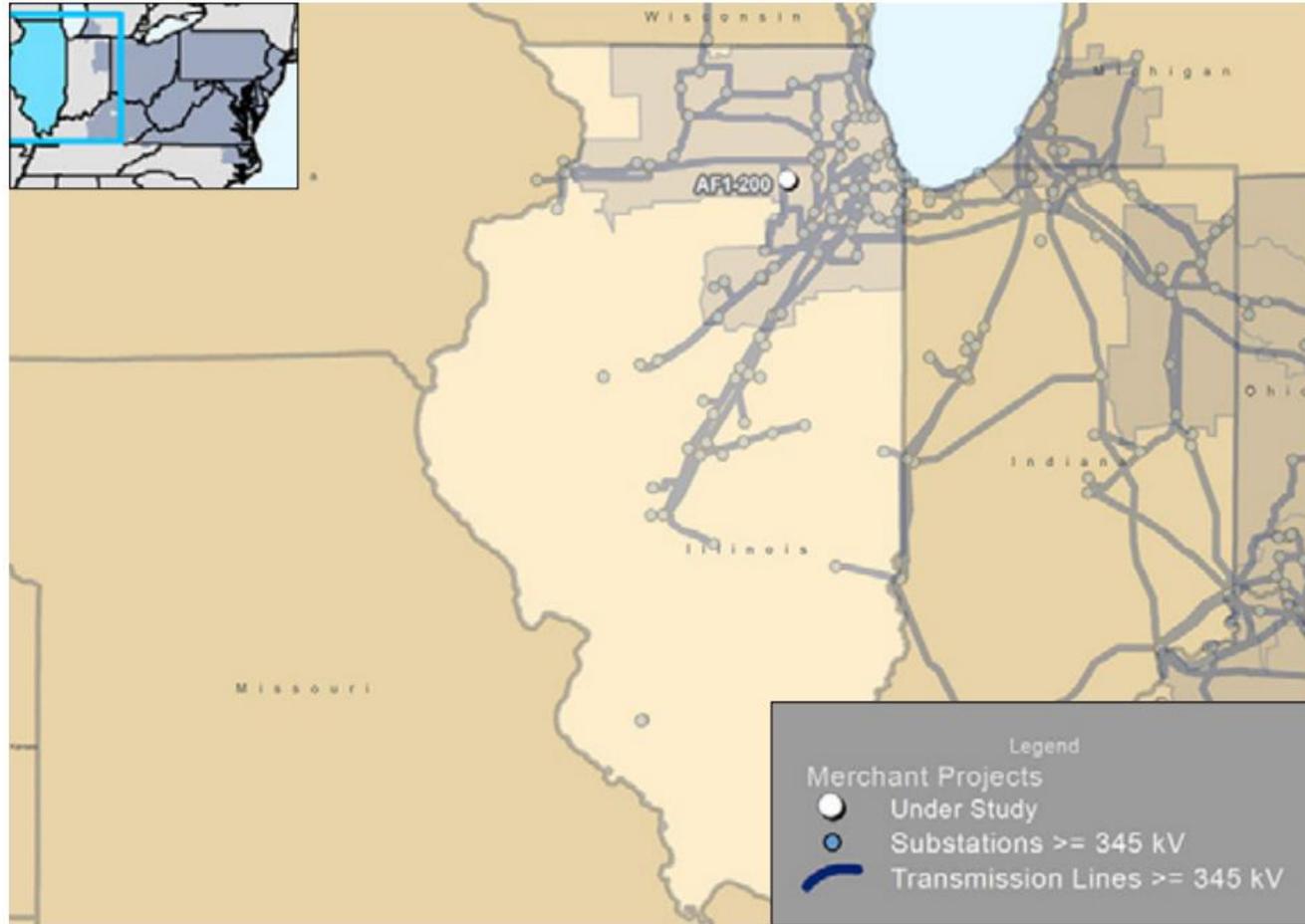
Note: Supplemental projects are transmission expansions or enhancements that are not required for compliance with PJM criteria and are not state public policy projects according to the PJM Operating Agreement. These projects are used as inputs to RTEP models, but are not required for reliability, economic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



# Illinois – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost (\$M)	TO Zone	TEAC Date
1	s2463	Replace ESS J310 138 kV breaker BT 1–2.	2/28/2023	\$2.10	ComEd	2/17/2021
2	s2519	Rebuild 3.5 miles of line 8604 on steel poles with 1113 kcmil ACSR conductor. Normally close 138 kV line 8604 circuit breaker at Bradley. Replace two overdutied 138 kV circuit breakers at Bradley.	12/31/2023	\$22.30		4/16/2021
3	s2520	Install 138 kV circuit breaker on line 0708 (State Line substation).		\$2.60		
4	s2582	Rebuild Hoffman Estates with BAAH GIS. Extend two 138 kV lines 1.5 miles to new customer substation.		\$0.00		7/16/2021

# Illinois – Merchant Transmission Project Requests



Queue Number	Queue Name	TO Zone	Status	Actual or Requested In-Service Date	Maximum Output (MW)
AF1-200	Plano 345 kV	ComEd	Active	1/31/2025	2,100

# Planning

## Load Forecast

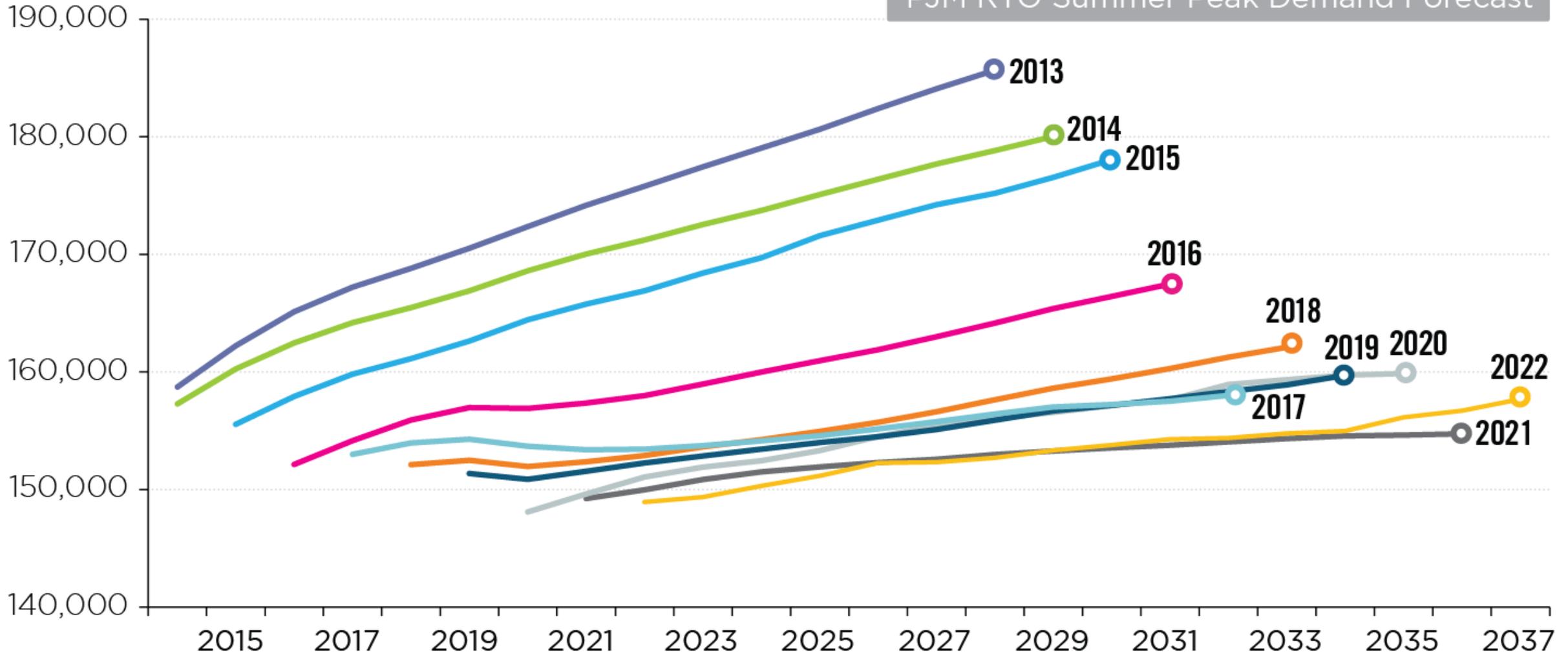


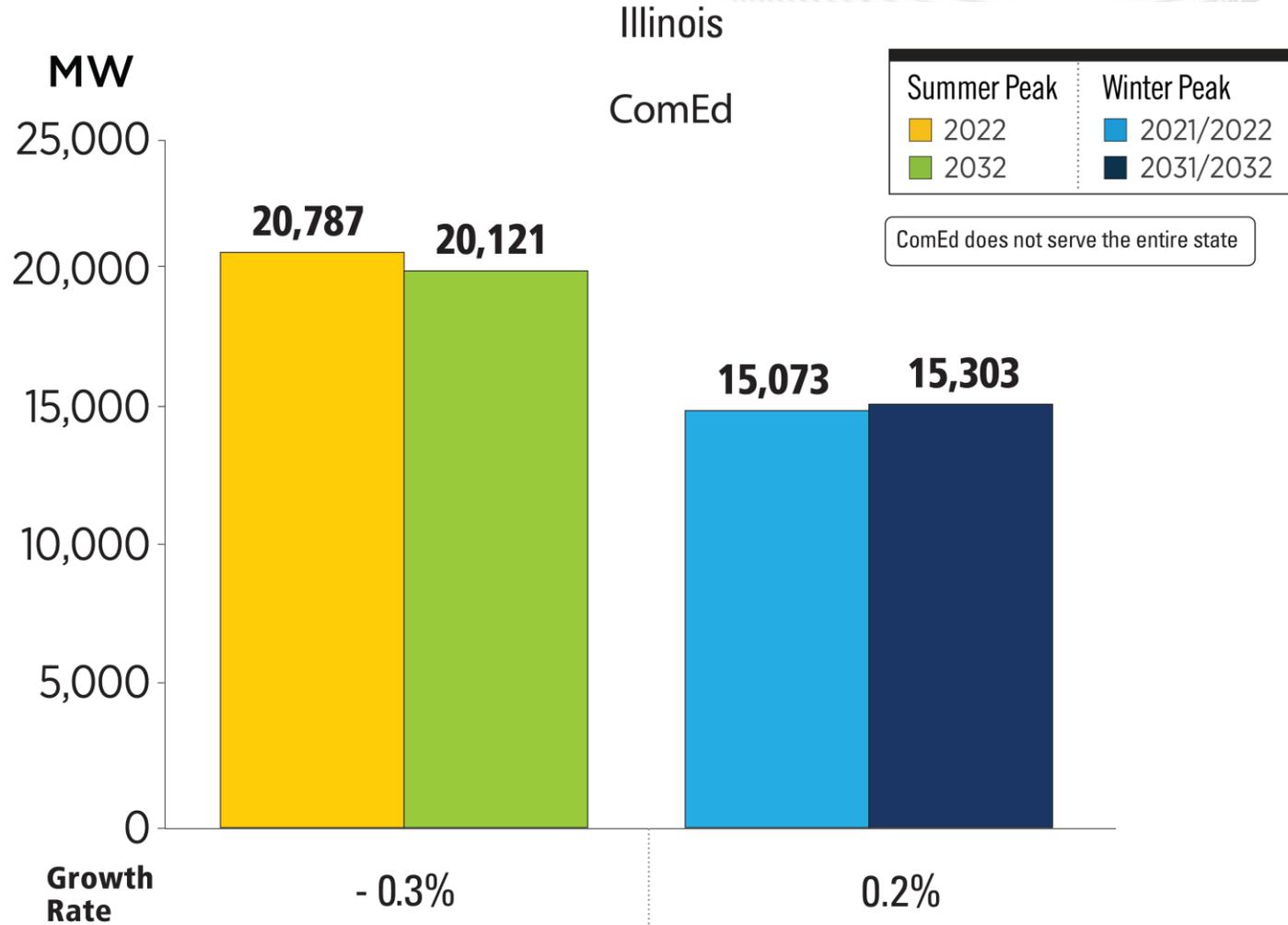
# PJM Annual Load Forecasts

(Jan. 2022)

Load (MW)

PJM RTO Summer Peak Demand Forecast





PJM RTO Summer Peak		PJM RTO Winter Peak	
2022	2032	2021/2022	2031/2032
149,938 MW	154,381 MW	132,102 MW	141,516 MW
Growth Rate 0.4%		Growth Rate 0.7%	

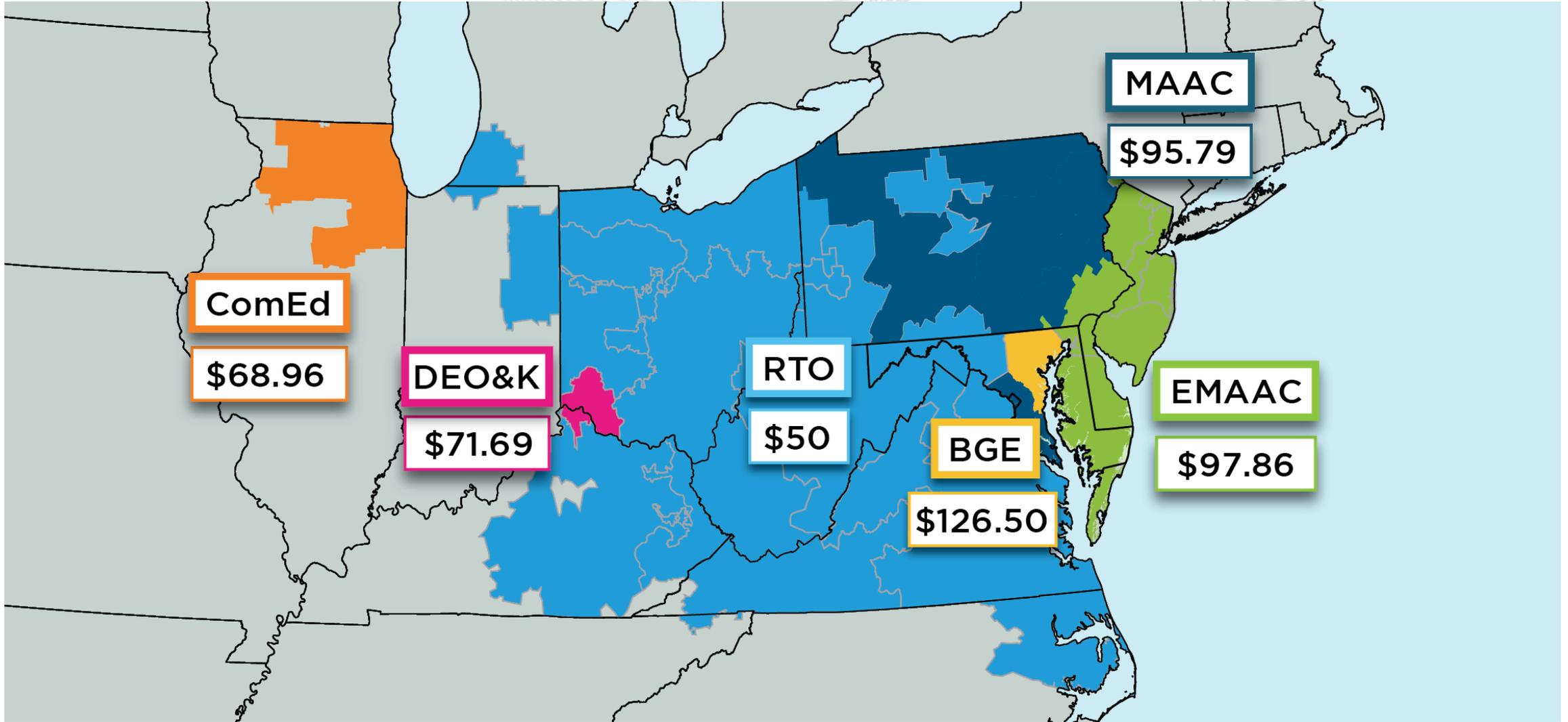
The summer and winter peak megawatt values reflect the estimated amount of forecasted load to be served by each transmission owner in the noted state/district. Estimated amounts were calculated based on the average share of each transmission owner's real-time summer and winter peak load in those areas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

# Markets

## Capacity Market Results



# 2022/2023 Base Residual Auction Clearing Prices (\$/MW-Day)





# PJM – 2022/2023 Cleared MW (UCAP) by Resource Type

	<b>ANNUAL</b>	<b>SUMMER</b>	<b>WINTER</b>	<b>Total (MW)</b>
<b>Generation</b>	130,844.9	9.9	686.8	131,541.6
<b>DR</b>	8,369.9	442.0	0.0	8,811.9
<b>EE</b>	4,575.7	234.9	0.0	4,810.6
<b>Total (MW)</b>	143,790.5	686.8	686.8	



# Illinois – Cleared Resources in 2022/23 Auction

(June 2, 2021)

	Cleared MW (Unforced Capacity)	Change from 2021/22 Auction
Generation	17,776	-2,089
Demand Response	1,511	-487
Energy Efficiency	724	-47
<b>Total</b>	<b>20,011</b>	<b>-2,623</b>

## ComEd Locational Clearing Prices

Clearing Price: \$68.96



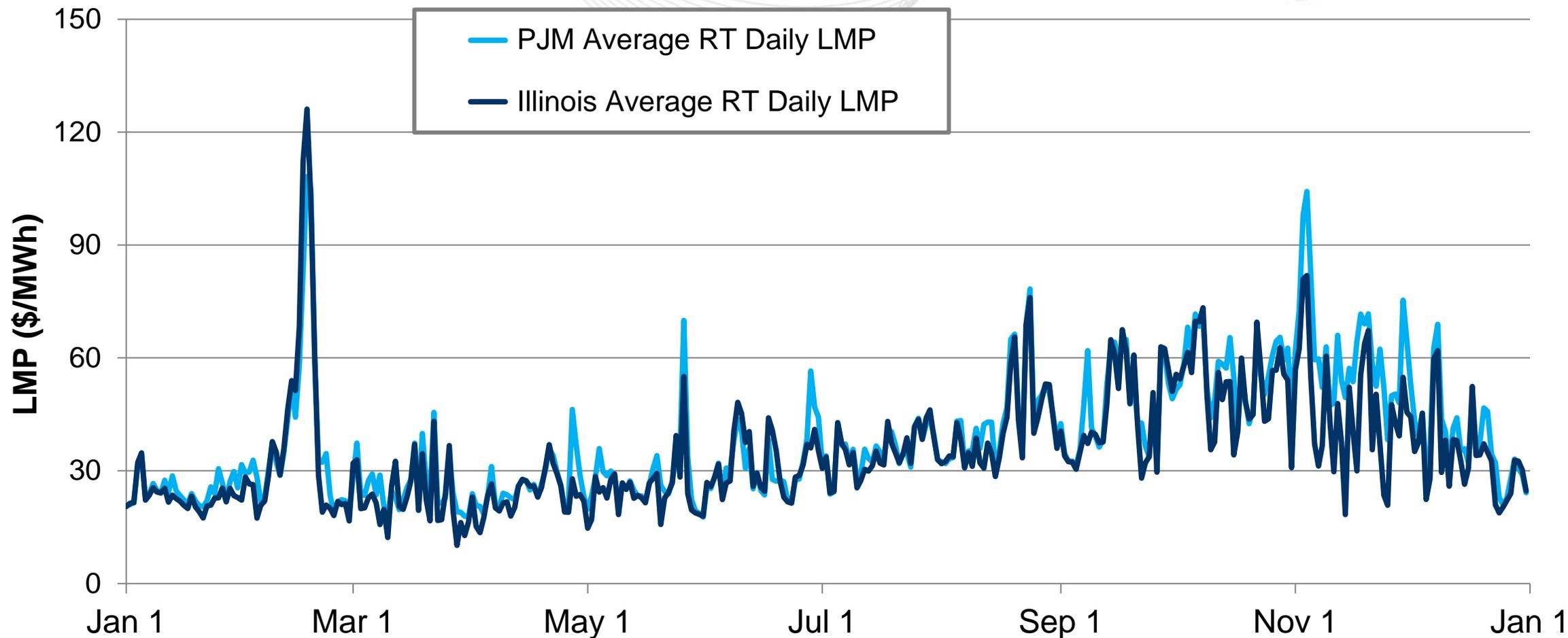
# Illinois – Offered and Cleared Resources in 2022/23 Auction

(June 2, 2021)

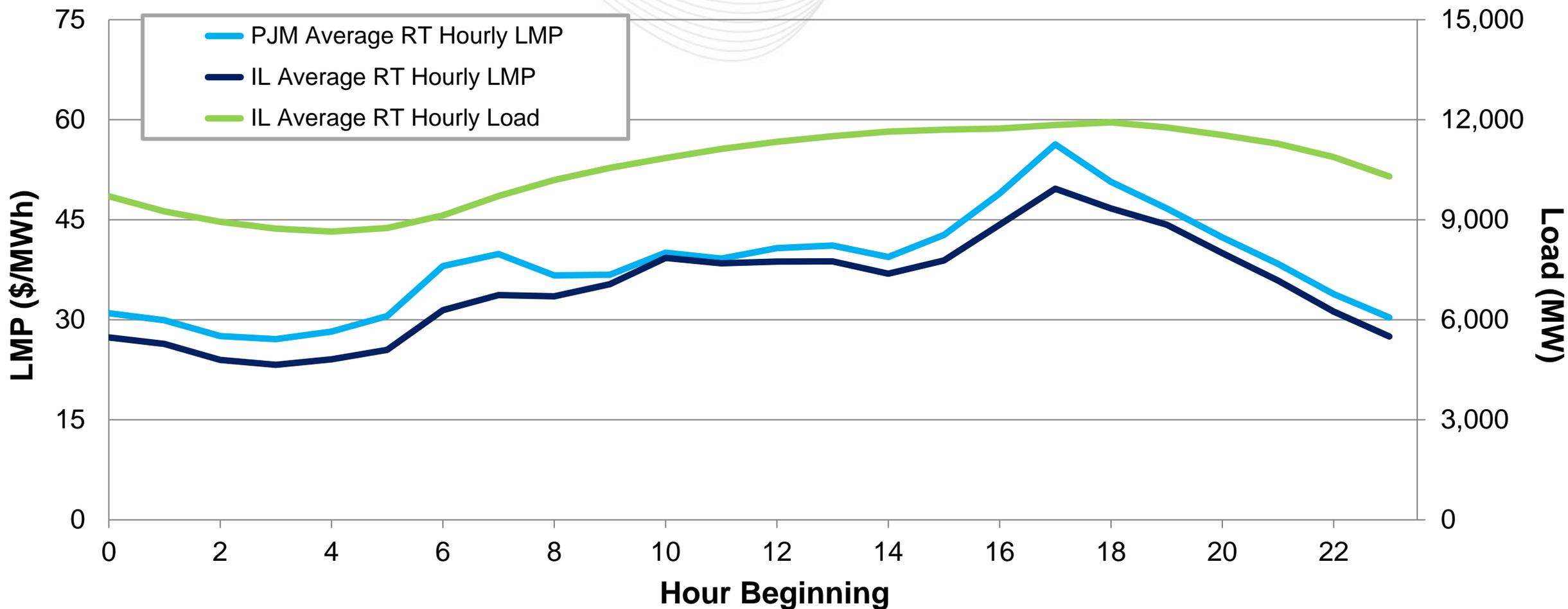
		Unforced Capacity
<b>Generation</b>	Offered MW	27,305
	Cleared MW	17,776
<b>Demand Response</b>	Offered MW	1,760
	Cleared MW	1,511
<b>Energy Efficiency</b>	Offered MW	912
	Cleared MW	724
<b>Total Offered MW</b>		<b>29,977</b>
<b>Total Cleared MW</b>		<b>20,011</b>

# Markets

## Market Analysis



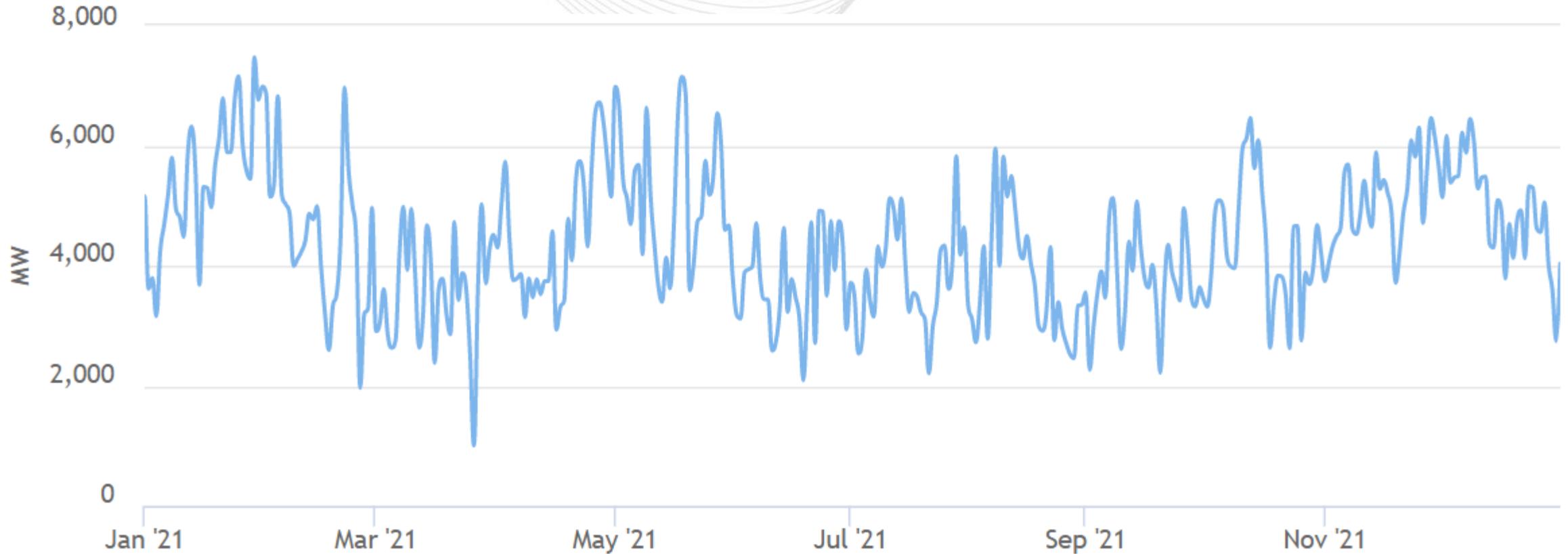
Illinois's average hourly LMPs were below the PJM average hourly LMP.





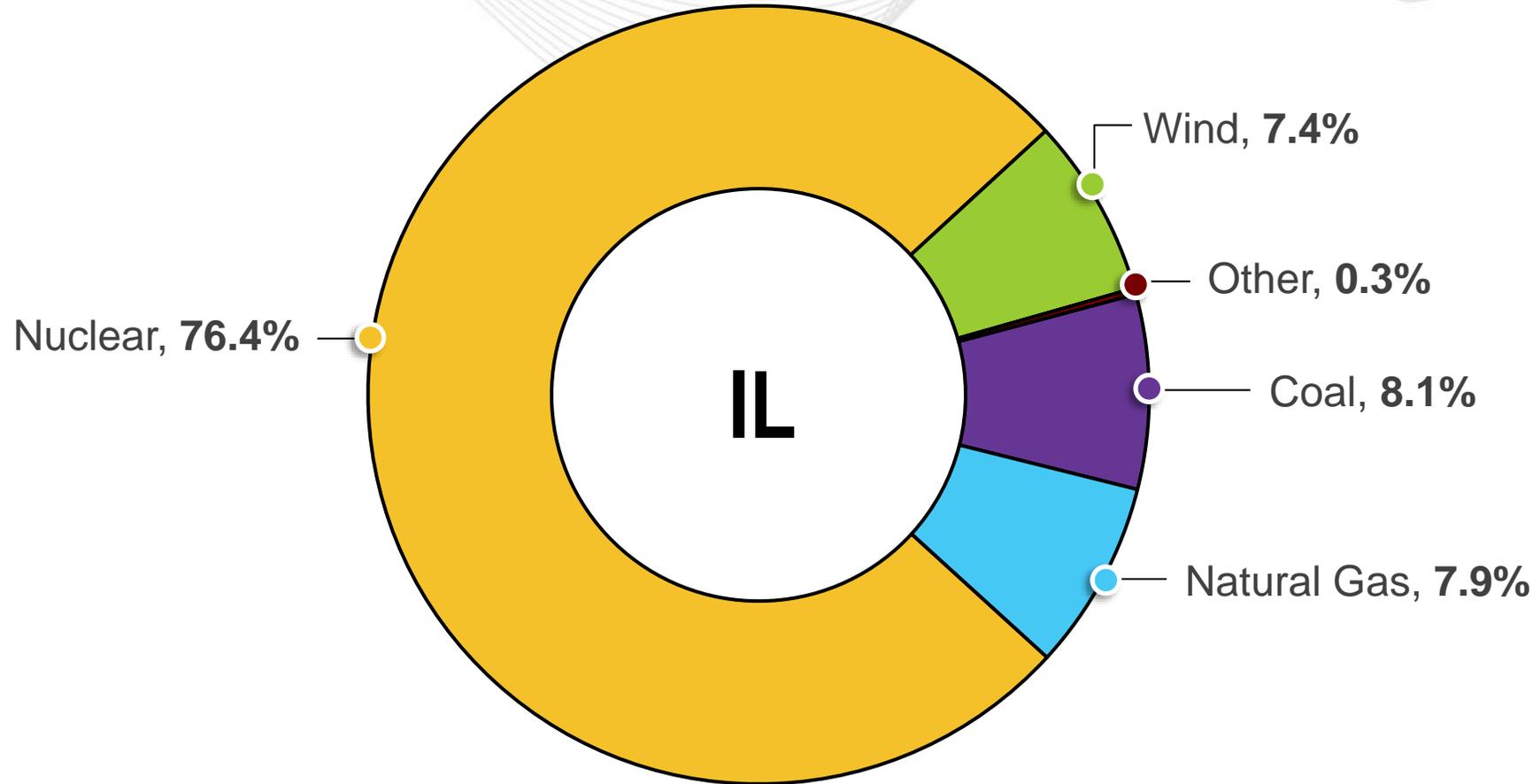
# Illinois – Net Energy Import/Export Trend

(Jan. 2021 – Dec. 2021)



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

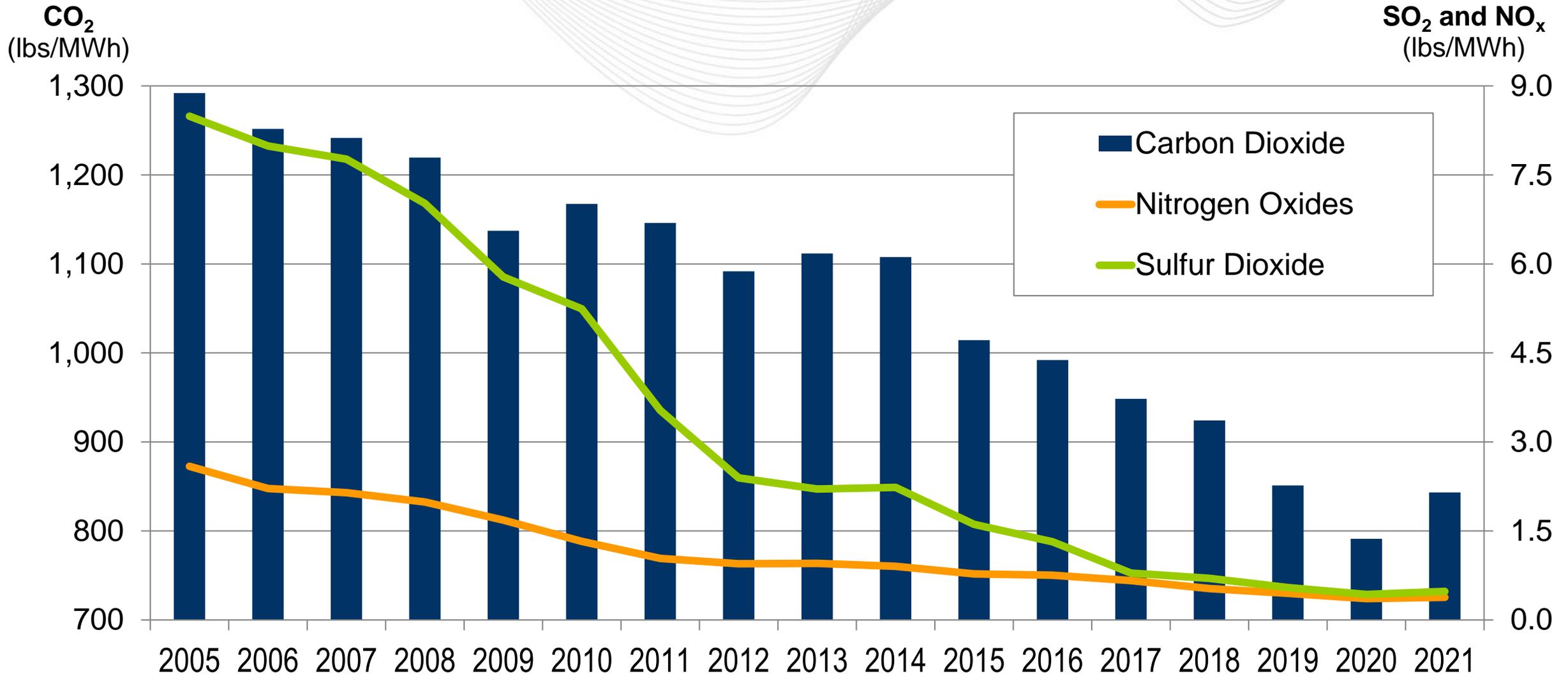
# Operations



The data in this chart comes from EIA Form 923 (2021) and represents only generators within the PJM portion of IL.



# 2005 – 2021 PJM Average Emissions





# Illinois – Average Emissions (lbs/MWh)

(Feb. 2022)

