Illinois State Report

July 2017

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Executive Summary

(July 2017)

- **Existing Capacity**: Nuclear and natural gas each represent 41 percent of the total installed capacity in Illinois. This differs from PJM where natural gas and coal are relatively even at 35 and 34 percent respectively.
- **Interconnection Requests**: Natural gas represents 95 percent of new interconnection requests in Illinois.
- **Deactivations**: No generating units in Illinois deactivated in 2016. This compares to 392 MW of capacity retirements PJM-wide in 2016.
- **RTEP 2016**: Illinois RTEP 2016 projects total over $98 million of investment. Approximately 40 percent represents baseline-type projects.
- **Load Forecast**: Illinois load growth is nearly flat, averaging approximately 0.3 percent per year over the next 10 years. This aligns with PJM RTO load growth projections.

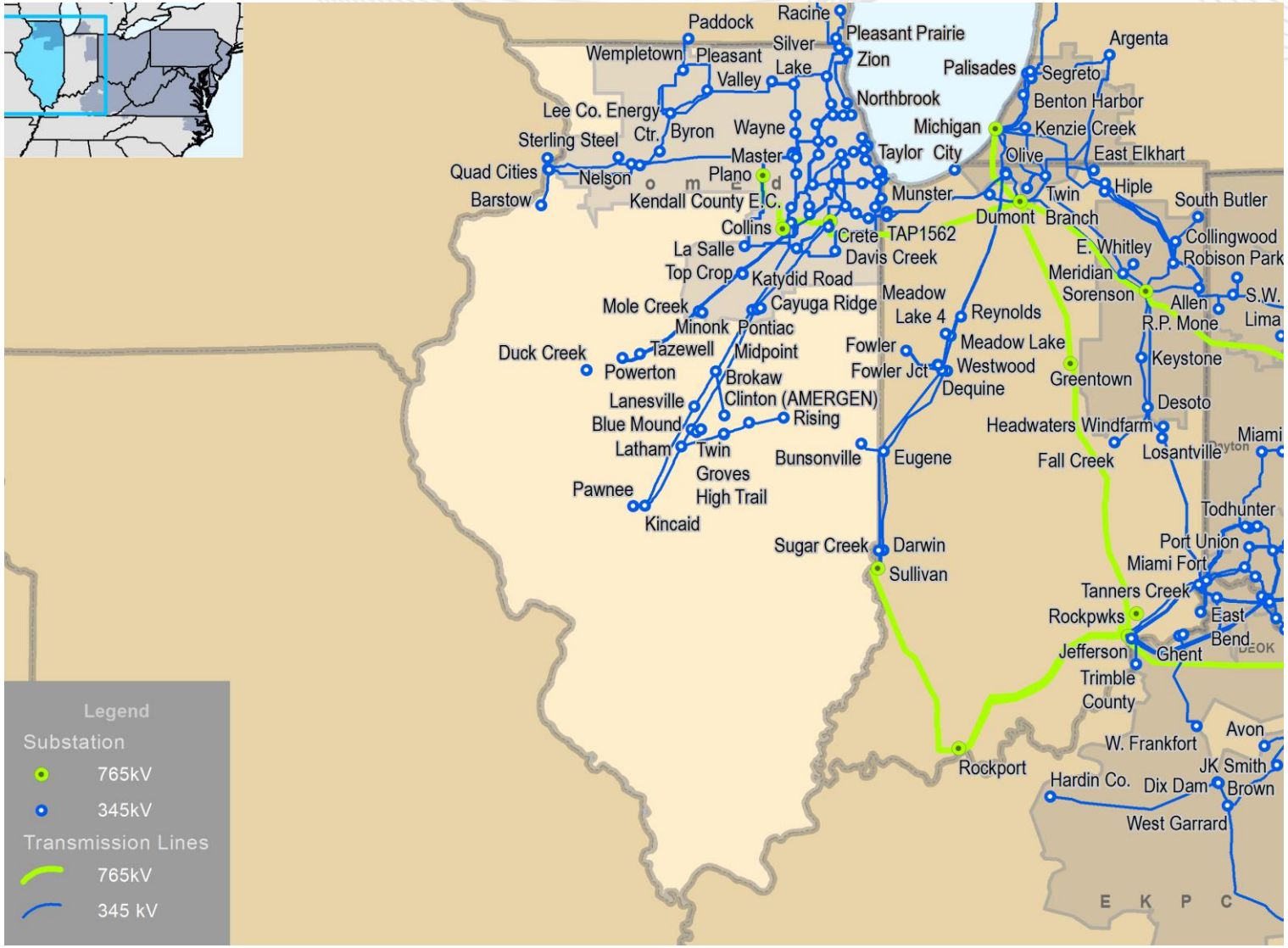
Executive Summary Cont.

(July 2017)

- **2020/21 Capacity Market**: Compared to the PJM footprint, Illinois's distribution of generation, demand response, and energy efficiency is similar.
- **6/1/14 – 5/31/17 Market Performance**: Illinois's average daily locational marginal prices were generally at or below PJM average daily LMPs. Nuclear resources represented 70 percent of generation produced in Illinois while coal represented 17 percent.
- **Emissions**: 2016 carbon dioxide emissions were slightly down from 2015; sulfur dioxide emissions held flat while nitrogen oxides rose slightly from 2015.

PJM Service Area – Illinois

(December 31, 2016)



Planning

Generation Portfolio Analysis

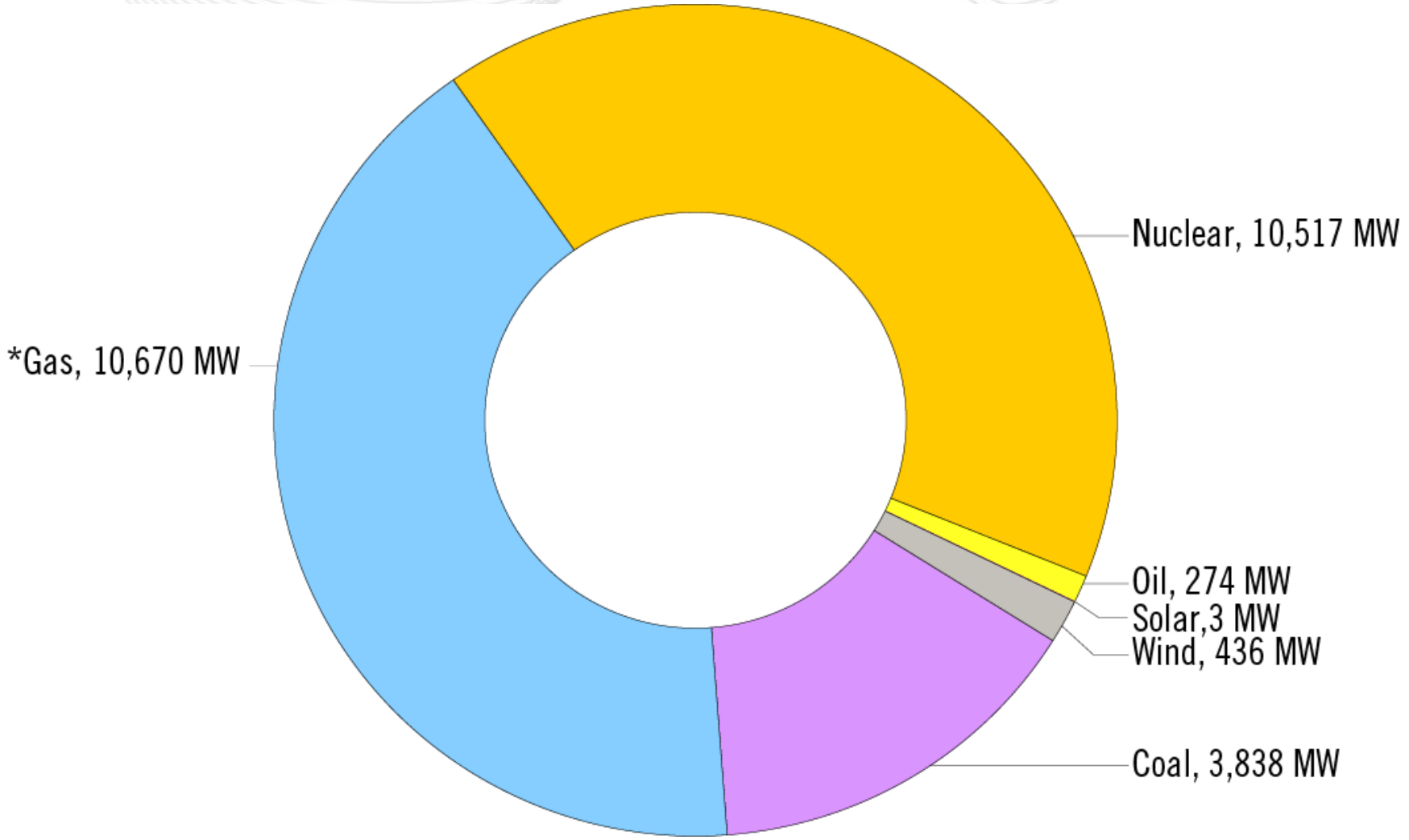
Illinois – Existing Installed Capacity
(Capacity Rights, December 31, 2016)

Summary:

Natural gas represents approximately 41 percent of the total installed capacity in Illinois while coal represents approximately 15 percent.

Overall in PJM, natural gas and coal are relatively even at 35 percent and 34 percent respectively.

* Gas Contains	
Natural Gas	10,657.9 MW
Other Gas	11.9 MW

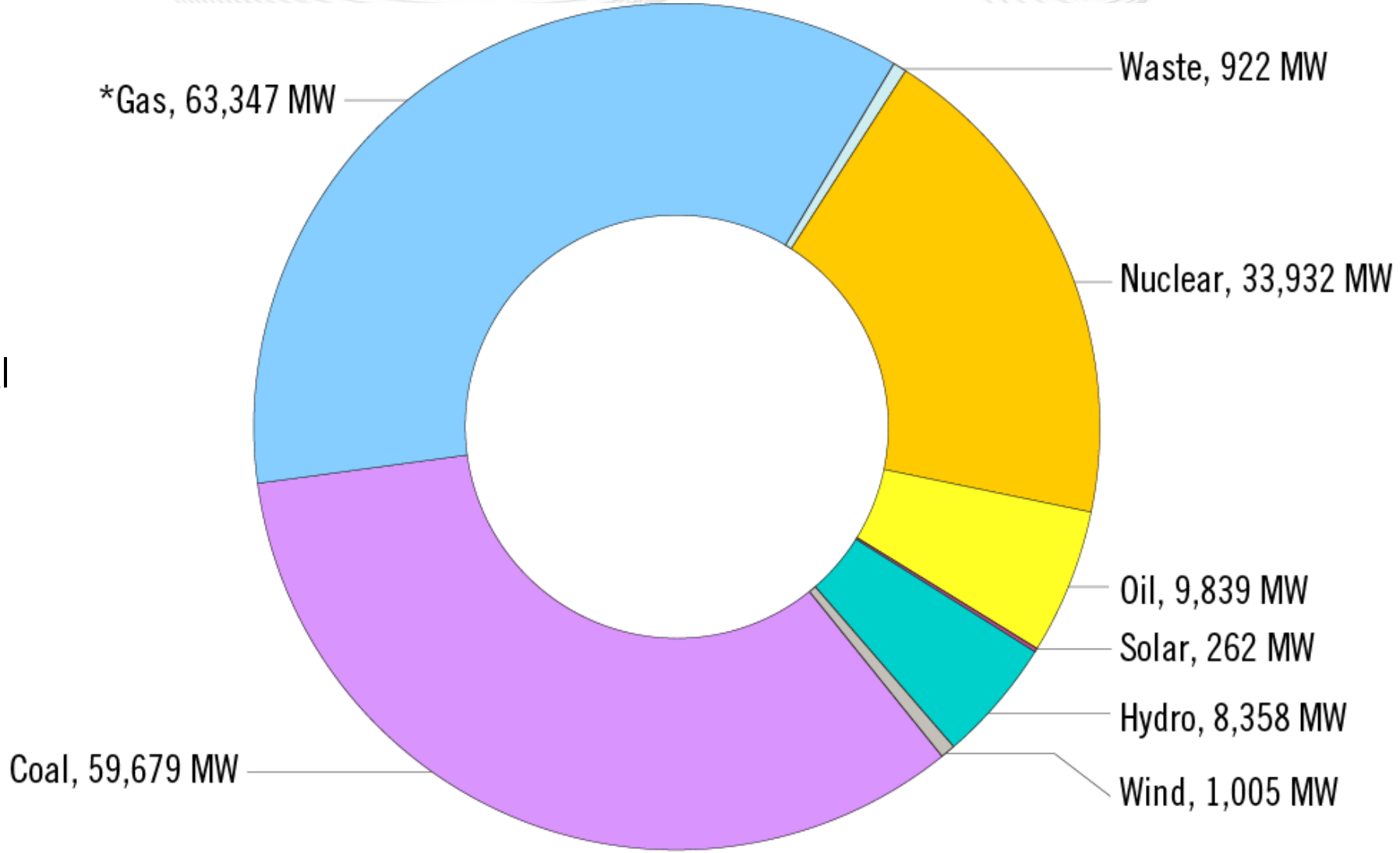


PJM – Existing Installed Capacity

(Capacity Rights, December 31, 2016)

In PJM, natural gas and coal make up nearly 70 percent total installed capacity.

* Gas Contains	
Natural Gas	62,941 MW
Other Gas	405 MW



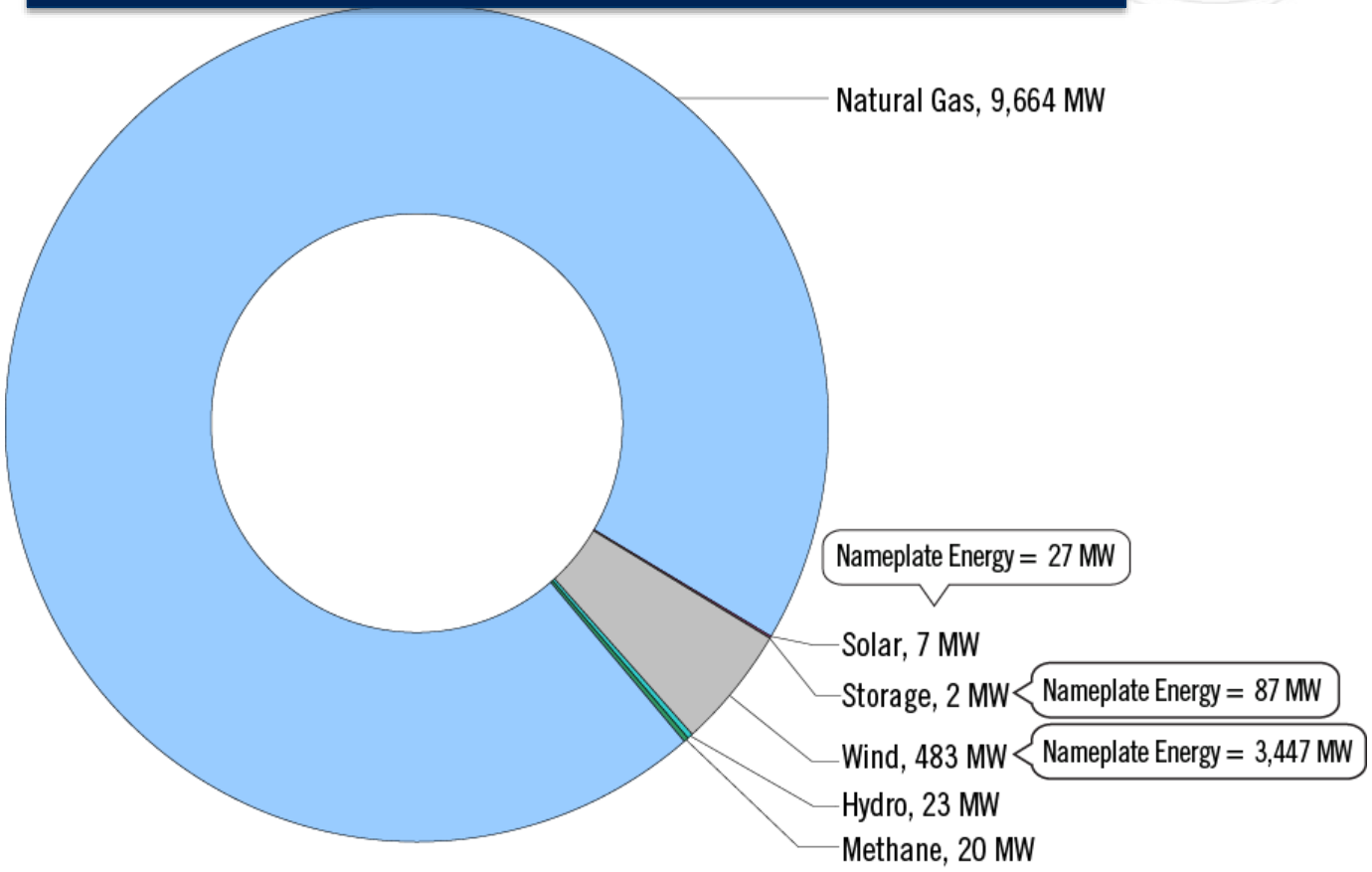
Illinois – Interconnection Requests

(Requested Capacity Rights, December 31, 2016)

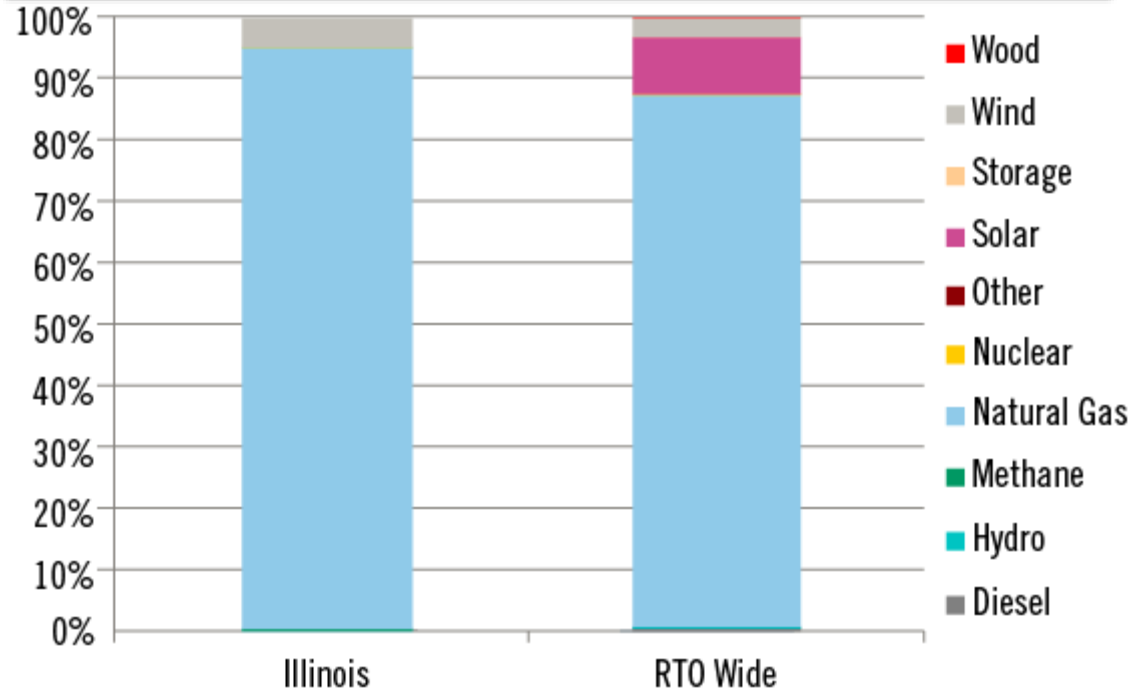
	MW	# of projects
Active	9,780	49
Under Construction	319	14
Suspended	100	1
Total	10,198	64

Natural gas represents nearly 95 percent of new interconnection requests in Illinois.

Total MW Capacity by Fuel Type



Fuel as a Percentage of Projects in Queue



Illinois – Interconnection Requests

	Active		In Service		Suspended		Under Construction		Withdrawn		Total Sum	
	MW	# of Projects	MW	# of Projects	MW	# of Projects	MW	# of Projects	MW	# of Projects	MW	# of Projects
Biomass									90.0	3	90.0	3
Coal									3,652.0	5	3,652.0	5
Diesel			22.0	2							22.0	2
Hydro							22.7	2	0.0	1	22.7	3
Methane	6.2	1	35.7	5			13.3	1	57.7	13	112.9	20
Natural Gas	9,551.3	25	1,323.0	10			112.6	6	2,487.0	9	13,473.9	50
Nuclear			385.8	10					782.0	5	1,167.8	15
Solar	7.0	3	3.4	1					32.3	7	42.7	11
Storage	2.2	6	0.0	3			0.0	1	0.0	10	2.2	20
Other			20.0	1					0.0	3	20.0	4
Wind	212.8	14	576.8	19	100.0	1	170.2	4	2,250.5	91	3,310.3	129
Total	**9,779.5**	**49**	**2,366.7**	**51**	**100.0**	**1**	**318.8**	**14**	**9,351.4**	**147**	**21,916.5**	**262**

Illinois – Progression History Interconnection Requests

(Requested Capacity Rights, 2004 - 2016)

Following Final Agreement execution 884 MW of capacity withdrew from PJM's interconnection process. Another 349 MW have executed agreements but were not in service as of December 31, 2016 (*Suspended* or *Under Construction*). Overall, 20% of requested capacity in Illinois reaches commercial operation.

Illinois – 2016 Actual Generation Deactivations

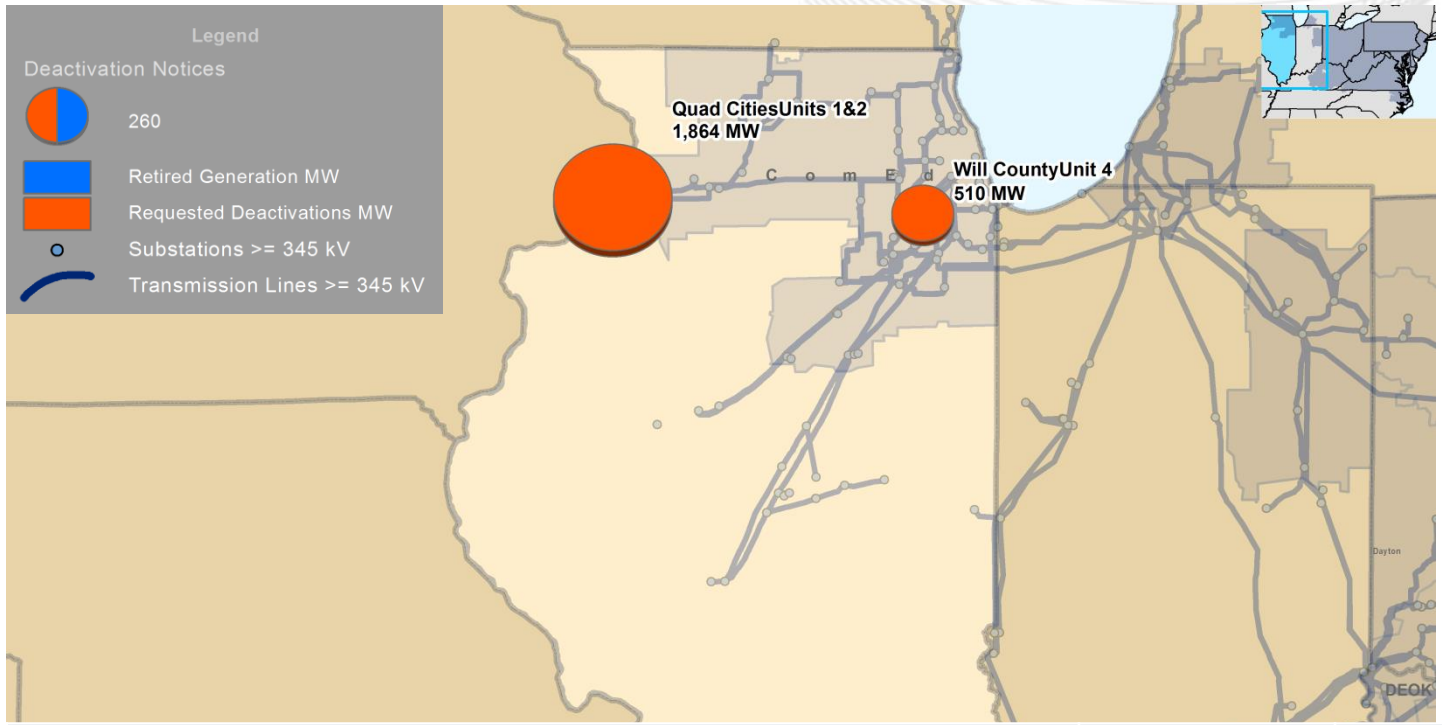
Unit	MW Capacity	TO Zone	Age	Actual/Projected Deactivation Date
None				

Summary:

- No generating units in IL deactivated in 2016
- 11 generating units across PJM totaling 392 MW of capacity deactivated in 2016

Illinois – 2016 Projected Generation Deactivations

(Capacity, As of December 31, 2016)



Summary:

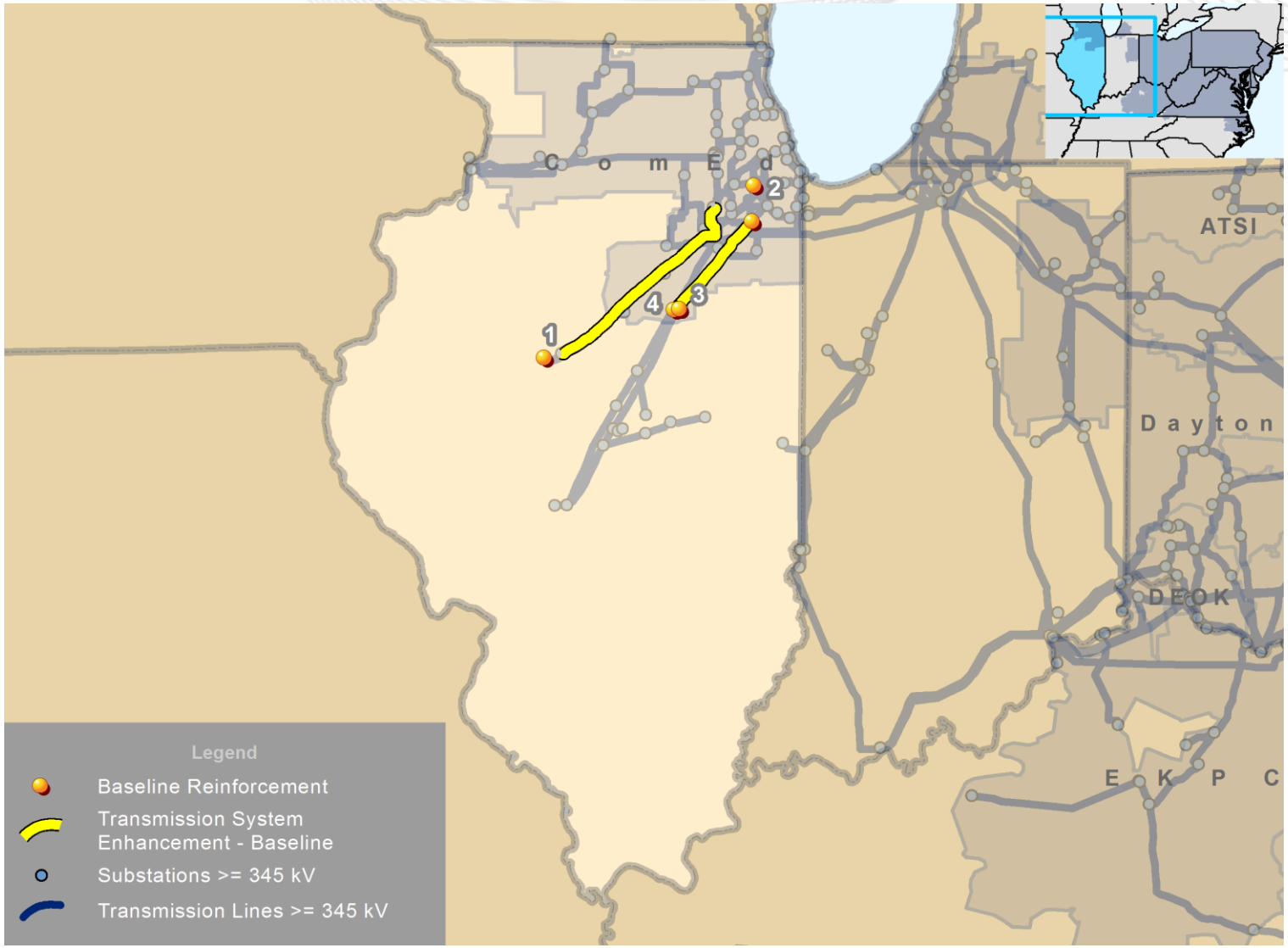
- Will County 4 changed its projected deactivation date from May 2018 to May 2020*
- Quad Cities units 1 and 2 submitted a deactivation notice then withdrew it **
- 23 generating units across PJM announced their intent to deactivate, ranging in date from 2016 - 2020. ***

Unit	MW Capacity	TO Zone	Age	Projected Deactivation Date
Will County 4*	510	ComEd	52	5/31/2020
Quad Cities Nuclear Generating Station Unit 1**	937	ComEd	43	Withdrawn
Quad Cities Nuclear Generating Station Unit 2***	927	ComEd	43	Withdrawn

Planning

Transmission Infrastructure Analysis

Illinois – RTEP Baseline Projects



Illinois – RTEP Baseline Projects

Map ID	Project ID	Project	Illinois Baseline Project Driver: Baseline Load Growth/ Deliverability & Reliability	Illinois Baseline Project Driver: Congestion Relief - Economic	Illinois Baseline Project Driver: Operational Performance	Illinois Baseline Project Driver: Generator Deactivation	Illinois Baseline Project Driver: TO Criteria Violation	Required Date	Cost ($M)	Designated Entity*	2016 TEAC Review
1	b2699.3	Add additional circuit breaker replacement of Powerton 345 kV BT3-4 and some relay revisions			●			6/1/2018	$2.00	ComEd	2/11/2016

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

Illinois – RTEP Baseline Projects

Map ID	Project ID	Project	Illinois Baseline Project Driver: Baseline Load Growth/ Deliverability & Reliability	Illinois Baseline Project Driver: Congestion Relief - Economic	Illinois Baseline Project Driver: Operational Performance	Illinois Baseline Project Driver: Generator Deactivation	Illinois Baseline Project Driver: TO Criteria Violation	Required Date	Cost ($M)	Designated Entity*	2016 TEAC Review
2	b2721	Goodings Grove – Balance Station Load (swap bus positions for 345 kV lines 1312 & 11620 and 345 kV lines 11604 & 11622) and replace 138 kV bus tie 2-3				●		6/1/2020	$5.40	ComEd	1/7/2016

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

Illinois – RTEP Baseline Projects

Map ID	Project ID	Project	Illinois Baseline Project Driver					Required Date	Cost ($M)	Designated Entity*	2016 TEAC Review
			Baseline Load Growth/ Deliverability & Reliability	Congestion Relief - Economic	Operational Performance	Generator Deactivation	TO Criteria Violation				
3	b2728	Mitigate sag limitations on Loretto - Wilton Center 345 kV Line and replace station conductor at Wilton Center		●				6/1/2019	$11.50	ComEd	2/11/2016

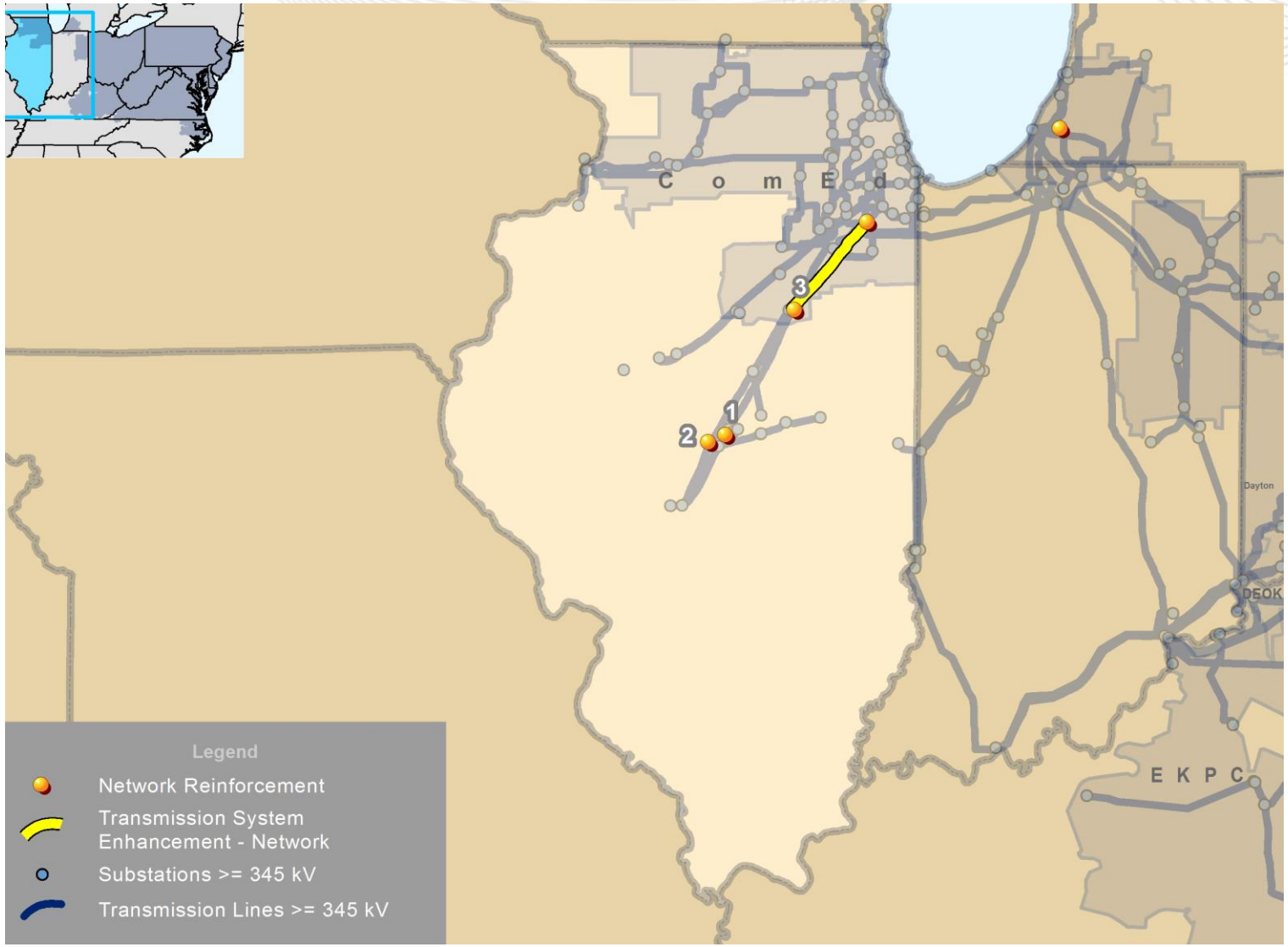
Note: Baseline upgrades are those that resolve a system reliability criteria violation.

Illinois – RTEP Baseline Projects

Map ID	Project ID	Project	Illinois Baseline Project Driver: Baseline Load Growth/ Deliverability & Reliability	Illinois Baseline Project Driver: Congestion Relief - Economic	Illinois Baseline Project Driver: Operational Performance	Illinois Baseline Project Driver: Generator Deactivation	Illinois Baseline Project Driver: TO Criteria Violation	Required Date	Cost ($M)	Designated Entity*	2016 TEAC Review
4	b2732.1	Cut-in of line 93505 Tazewell - Kendall 345 kV line into Dresden				•		6/1/2020	$17.00	ComEd	2/11/2016
	b2732.2	Raise towers to remove the sag limitations on 345 kV line 8012 Pontiac - Loretto				•		6/1/2020	$3.40	ComEd	2/11/2016

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

Illinois – RTEP Network Projects

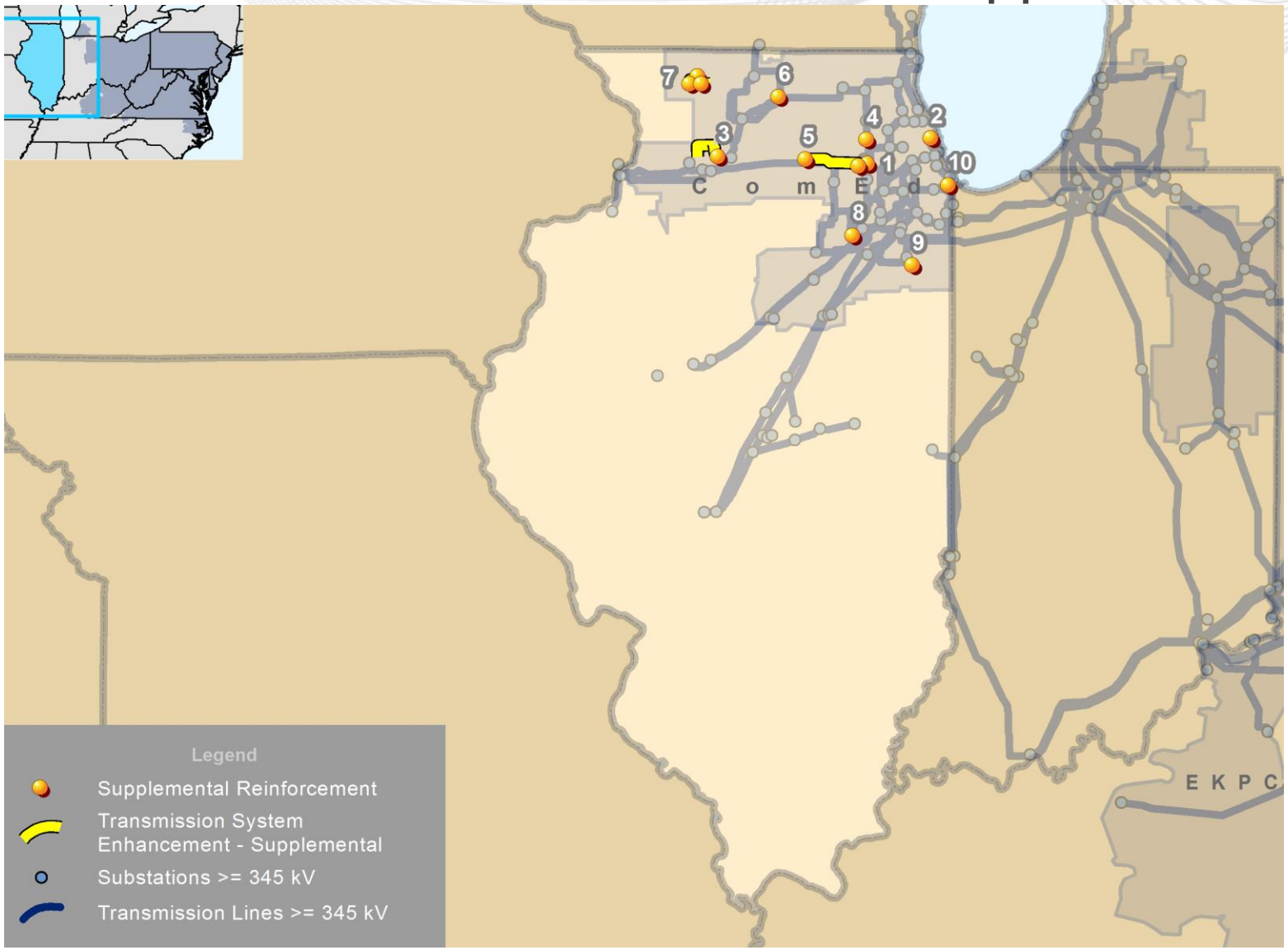


Illinois – RTEP Network Projects

Map ID	Project ID	Project	Illinois Network Project Drivers: Generation Interconnection	Illinois Network Project Drivers: Merchant Transmission Interconnection	Illinois Network Project Drivers: Long-term Firm Transmission Service	Required Date	Cost ($M)	TO Zone(s)	2016 TEAC Review
1	n3999	Install 345 kV three breaker ring bus	W4-005			12/31/2017	$15.00	ComEd	10/6/2016
2	n4001	Install an extra three 345 kV breakers at TSS 92 Mt. Pulaski substation	X2-022			12/31/2013	$9.00	ComEd	10/6/2016
3	n4348	to mitigate sag limitations to achieve full conductor thermal capability on Loretto-Wilton Center 345 kV line	W4-005			4/1/2017	$16.70	ComEd	10/6/2016
4	n4727	Install new AA1-018 345kV Interconnection substation	AA1-018			12/31/2017	$18.00	ComEd	10/6/2016

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.

Illinois – TO Supplemental Projects



Illinois – TO Supplemental Projects

			Illinois Supplemental Project Driver			
Map ID	Project ID	Project	Required Date	Cost ($M)	TO Zone(s)	2016 TEAC Review
1	s1108	Replace the 345 kV CB at Electric Junction on Electric Junction - Wolf Crossing 345 kV line (line #1223).	12/31/2016	$8.30	ComEd	1/7/2016
2	s1115	Replace Northwest 138 kV bus ties 711, 713, 714, 716, 721, 723 & 725	12/31/2017	$11.70	ComEd	2/4/2016
3	s1117	Reconductor 138 kV line 12411 for 4.2 miles from Dixon to Dixon Tap, replace line circuit breaker at Dixon, replace bus tie circuit breaker and rehab bus	6/1/2017	$17.20	ComEd	2/4/2016
4	s1119	Replace Wayne 345/138/34.5 kV transformer TR81 and station conductor	12/31/2017	$7.70	ComEd	2/4/2016
5	s1121	Rebuild portions of 138 kV line 11106 for 19.4 miles from North Aurora to Waterman	2/26/2016	$24.80	ComEd	2/4/2016

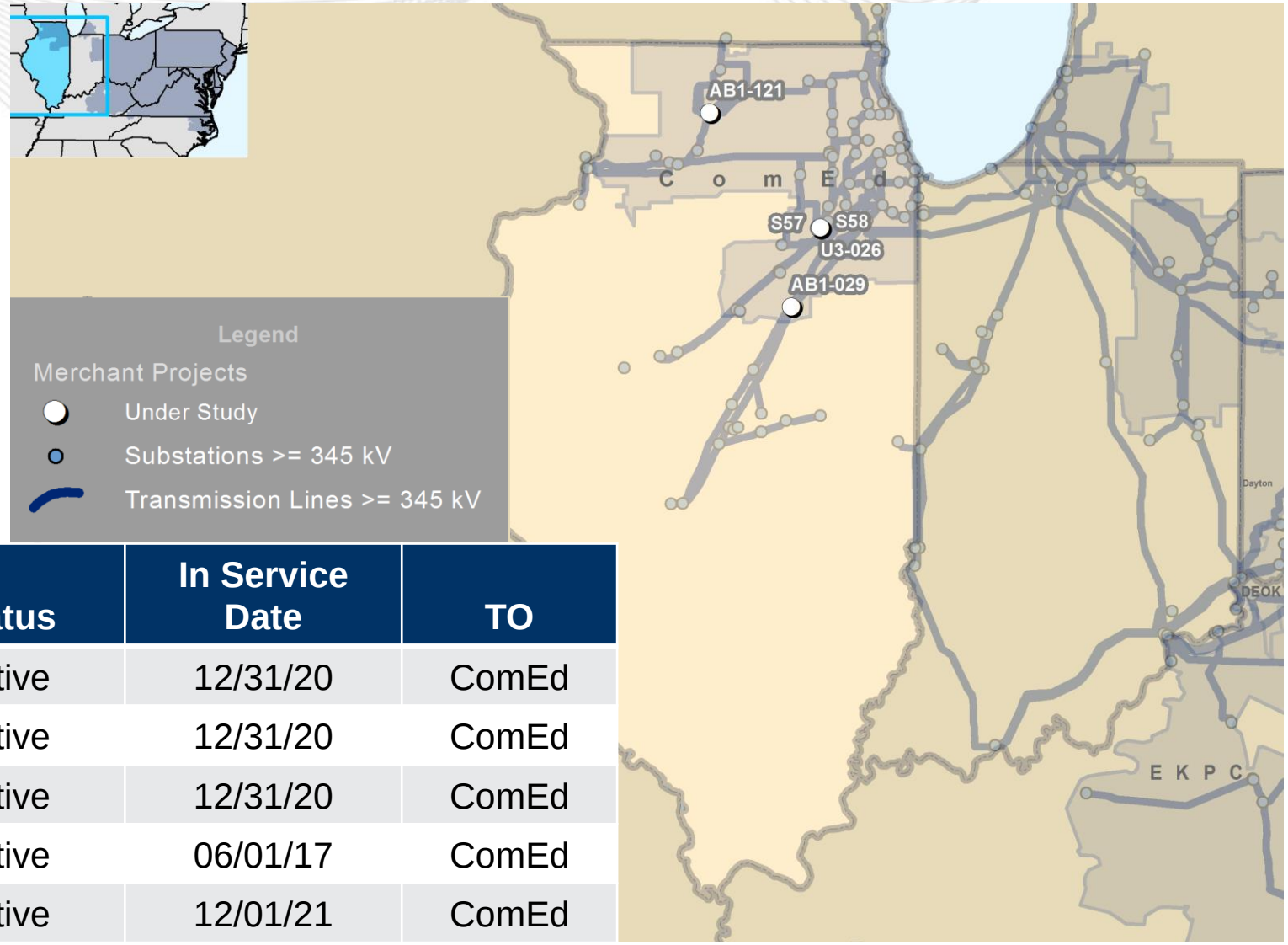
Note: Supplemental projects are transmission expansions or enhancements that are used as inputs to RTEP models, but are not required for reliability, economic efficiency or operational performance criteria, as determined by PJM.

Illinois – TO Supplemental Projects

			Illinois Supplemental Project Driver			
Map ID	Project ID	Project	Required Date	Cost ($M)	TO Zone(s)	2016 TEAC Review
6	s1123	Cherry Valley - Replace 345/138 kV transformer TR82 high-side MOD with a circuit switcher, upgrade secondary conductor, replace 138 kV BT2-3	12/31/2017	$8.30	ComEd	2/4/2016
7	s1168	Reconfigure 138 kV lines 11904 (Lancaster – Eleroy Tap) and 19414 (ESS B-427 – Freeport) in the far western part of our system, and add breakers at Lancaster	6/1/2017	$8.60	ComEd	7/26/2016
8	s1169	Expand 138 kV Channahon West substation with five 138 kV CBs and a new 138/34 kV TR	6/1/2017	$22.00	ComEd	7/26/2016
9	s1171	Reconfigure Bradley 138KV substation to add 138 kV bus ties 1-2 & 3-4 and relocate lines	12/31/2017	$9.00	ComEd	7/26/2016
10	s1172	Refurbish & reconfigure Hegewisch 138 kV substation into a breaker-and-a-half configuration	12/31/2017	$38.00	ComEd	7/26/2016

Note: Supplemental projects are transmission expansions or enhancements that are used as inputs to RTEP models, but are not required for reliability, economic efficiency or operational performance criteria, as determined by PJM.

Illinois – Merchant Transmission Project Requests

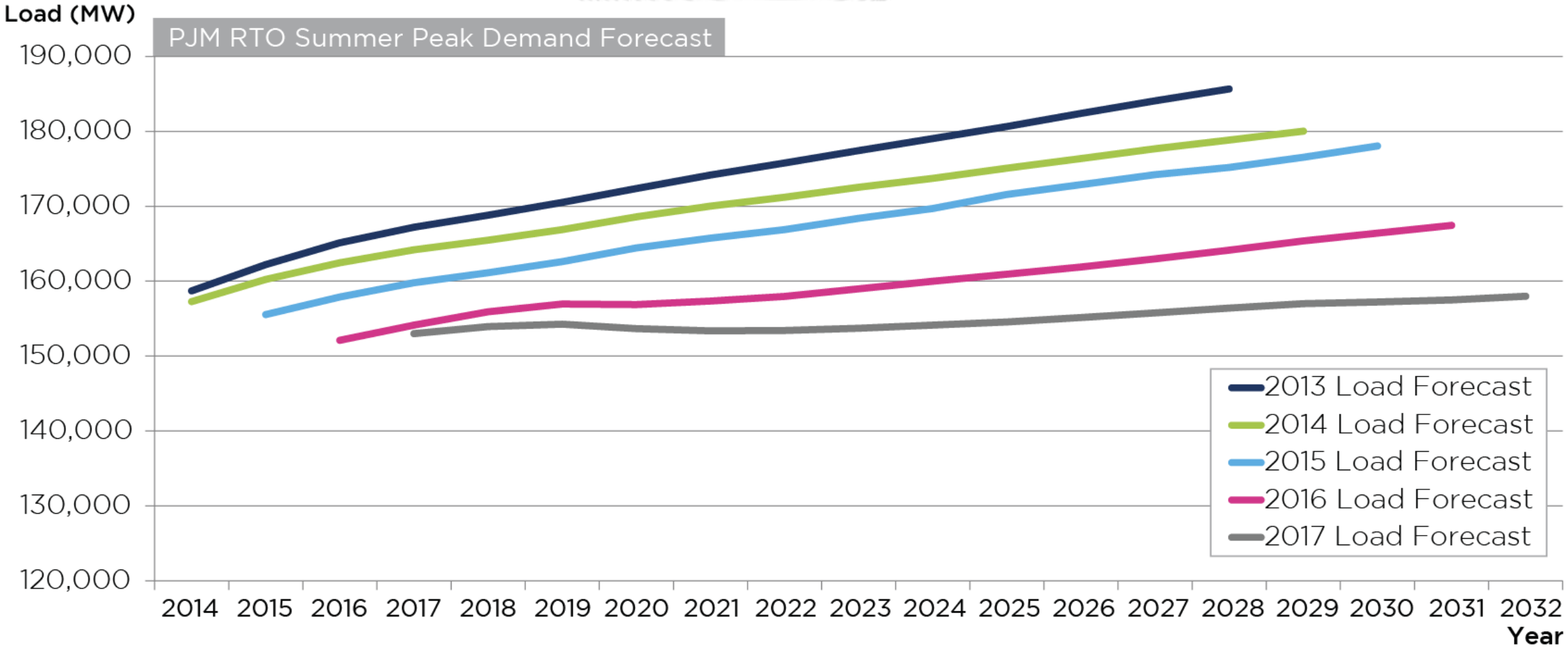


Queue	Project Name	MFO	Status	In Service Date	TO
S57	Collins	1500	Active	12/31/20	ComEd
S58	Collins	1748	Active	12/31/20	ComEd
U3-026	Collins	0	Active	12/31/20	ComEd
AB1-029	Loretto-Pontiac	35	Active	06/01/17	ComEd
AB1-121	Byron 345 kV	1927	Active	12/01/21	ComEd

Planning
Load Forecast

PJM Annual Load Forecasts

(January 9, 2017)



Illinois – 2017 Load Forecast Report

	Summer Peak (MW)			Winter Peak (MW)		
Transmission Owner	2017	2027	Growth Rate (%)	2016/17	2026/27	Growth Rate (%)
Commonwealth Edison Company	22,296	22,872	0.3%	15,807	16,308	0.3%
PJM RTO	**152,999**	**155,773**	**0.2%**	**131,391**	**134,915**	**0.3%**

*PJM does not serve the entire state of Illinois.

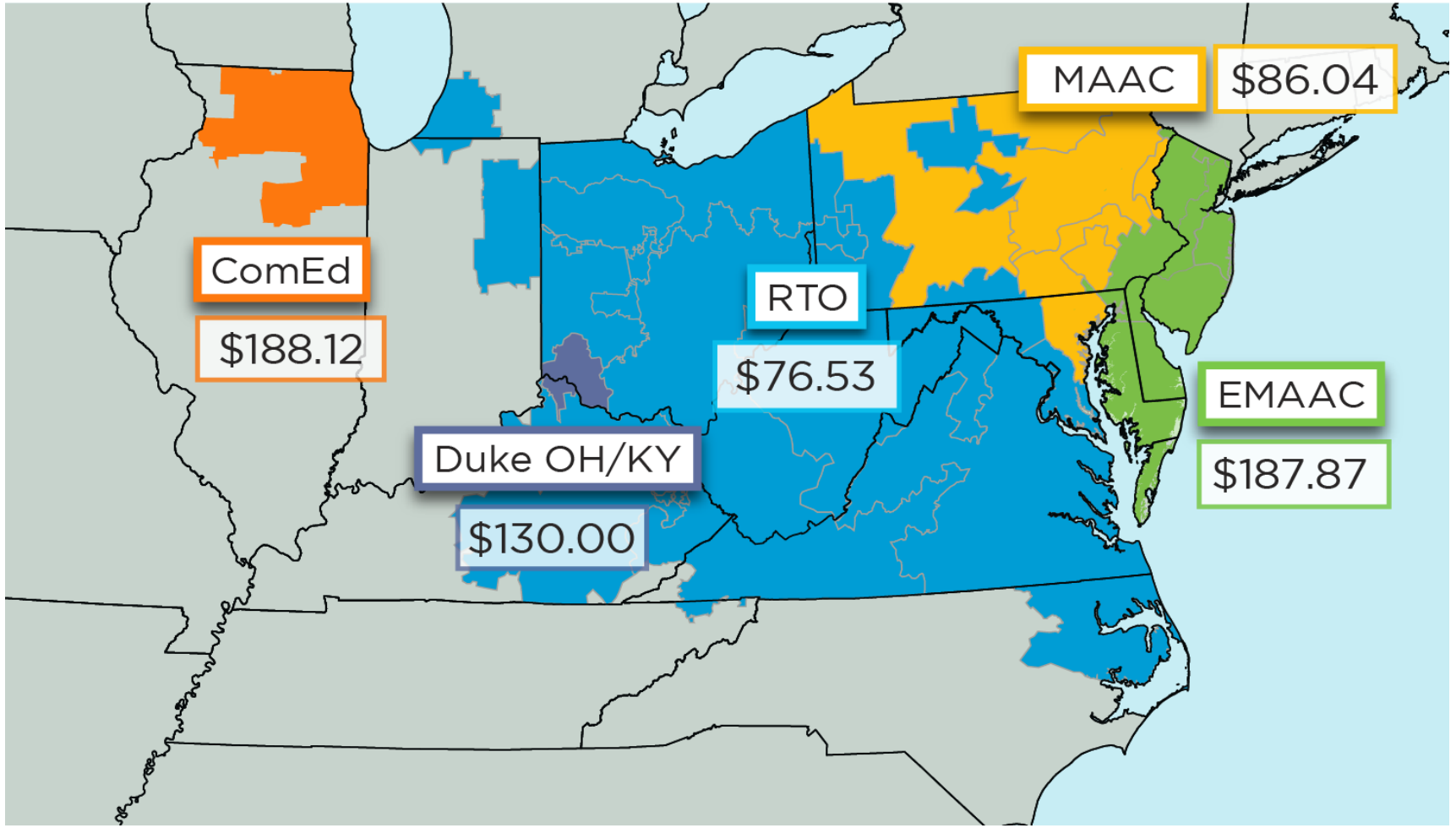
*PJM's 2017 forecast reflects methodology improvements implemented in 2016: variables to account for equipment and appliance saturation and efficiency, distributed solar generation adjustments and more refined treatment of weather data.

Markets

Capacity Market Results

PJM 2020/21 Auction Clearing Prices

(May 23, 2017)



Illinois - Cleared Resources in 2020/21 Auction

(May 23, 2017)

	Cleared MW (Unforced Capacity)	Change from 2019/20 Auction*
Generation	21,894	1,405
Demand Response	1,513	(244)
Energy Efficiency	702	(23)
Total	24,109	1,138

ComEd Locational Clearing Prices

Clearing Price: $188.12

In 2019/20 IL had 873 MW of Capacity Performance Demand Response Clear.
In 2020/21 IL had 1,513 MW of Capacity Performance Demand Response Clear.

* 2019/20 Cleared megawatts reflect clearing as either 'Capacity Performance' or 'Base Capacity'

PJM - Cleared Resources in 2020/21 Auction

(May 23, 2017)

	Cleared MW (Unforced Capacity)	Change from 2019/20 Auction*
Generation	155,976	882
Demand Response	7,820	(2,528)
Energy Efficiency	1,710	195
Total	165,506	(1,450)

In 2019/20 PJM had 613 MW of Capacity Performance Demand Response Clear.
In 2020/21 PJM had 7,820 MW of Capacity Performance Demand Response Clear.

* 2019/20 Cleared megawatts reflect clearing as either 'Capacity Performance' or 'Base Capacity'

Illinois – Offered and Cleared Resources in 2020/21 Auction

(May 23, 2017)

		Unforced Capacity
Generation	Offered MW	24,834
	Cleared MW	21,894
Demand Response	Offered MW	1,794
	Cleared MW	1,513
Energy Efficiency	Offered MW	808
	Cleared MW	702
Total Offered MW		27,437
Total Cleared MW		24,109

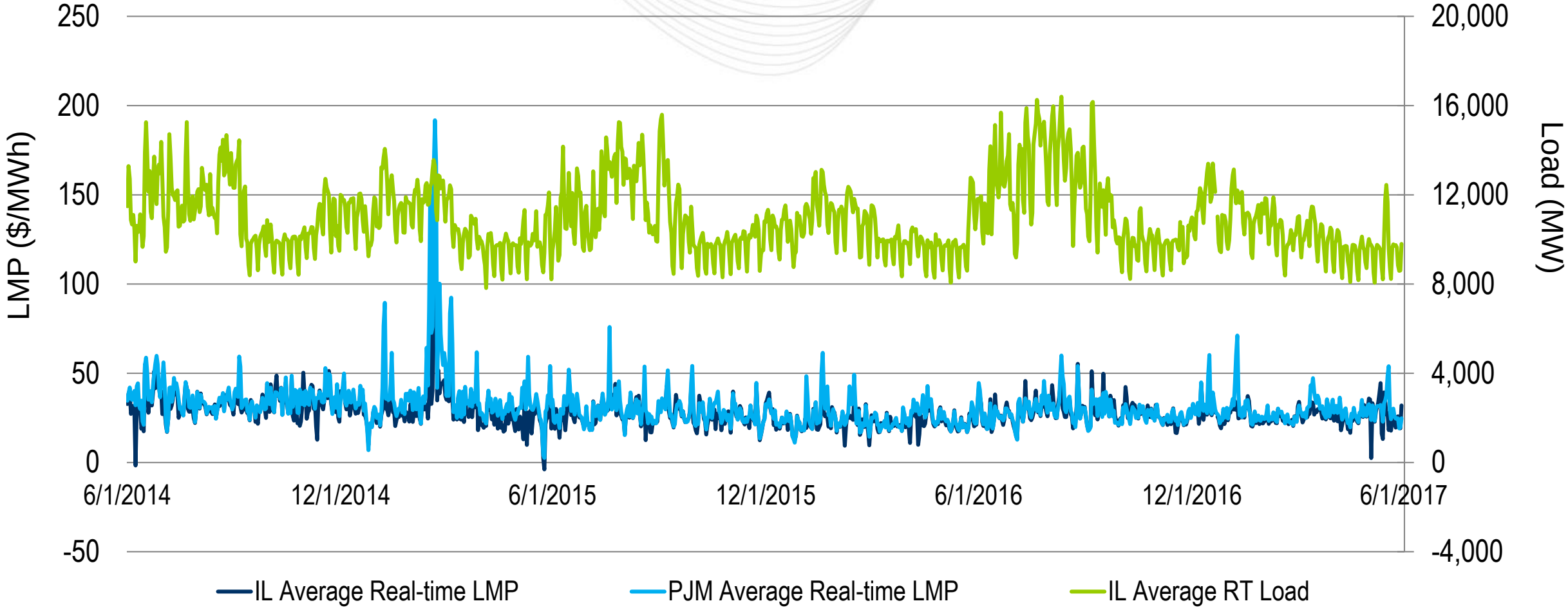
Markets

Market Analysis

Illinois - Average Daily Load and LMP

(June 1, 2014 - May 31, 2017)

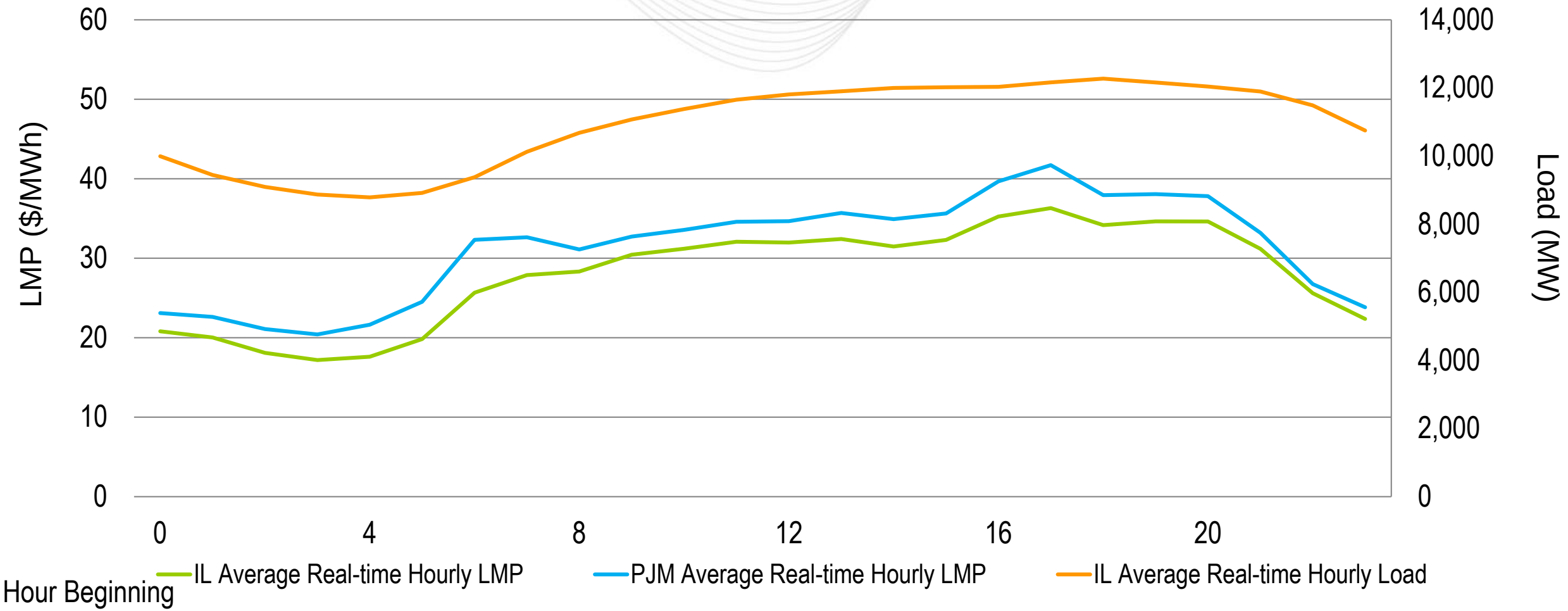
Illinois' average daily LMPs generally align with the PJM average daily LMP



Illinois – Hourly Average LMP and Load

(June 1, 2014 – May 31, 2017)

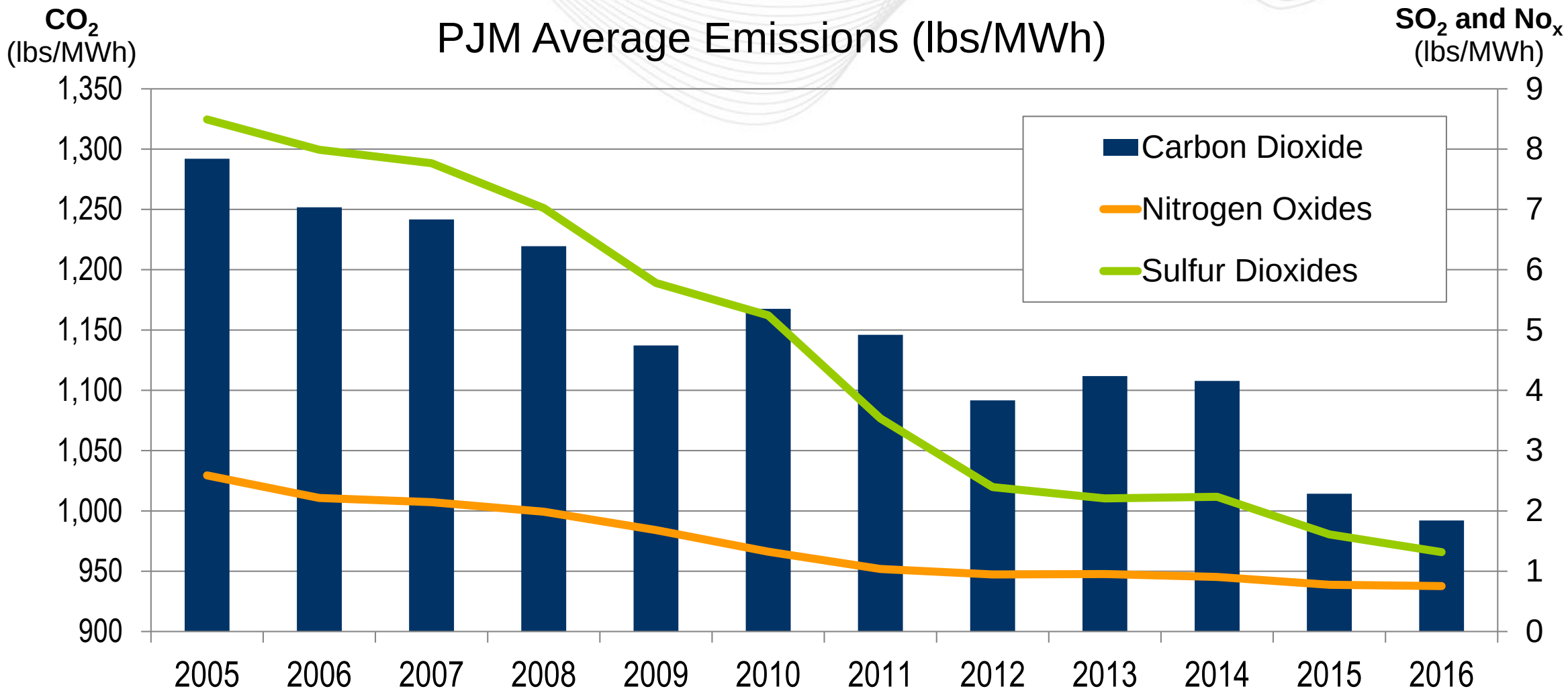
Illinois' hourly LMPs were below the PJM average.



Operations
Emissions Data

PJM - Average Emissions (lbs/MWh)

(December 31, 2016)



Illinois - Average Emissions (lbs/MWh)

(December 31, 2016)