2018 Virginia State Infrastructure Report
(January 1, 2018 – December 31, 2018)

May 2019

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

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Executive Summary

(May 2019)

- **Existing Capacity:** Natural gas represents approximately 47.4 percent of the total installed capacity in Virginia while coal represents approximately 13.6 percent. This differs from PJM where natural gas and coal are at 40.2 and 30.7 percent of total installed capacity.
- **Interconnection Requests:** Solar represents 51.6 of new interconnection requests in Virginia, while natural gas represents approximately 42.9 percent of new requests.
- **Deactivations**: 1,294 MW deactivated in Virginia in 2018.
- **RTEP 2018:** Virginia RTEP 2018 projects total more than $997 million in investment. Approximately 29.7 percent of that represents supplemental projects. These investment figures only represent RTEP projects that cost at least $5 million.
- **Load Forecast:** Virginia load growth is nearly flat, averaging between 0.1 and 1.1 percent per year over the next 10 years. This aligns with PJM RTO load growth projections.

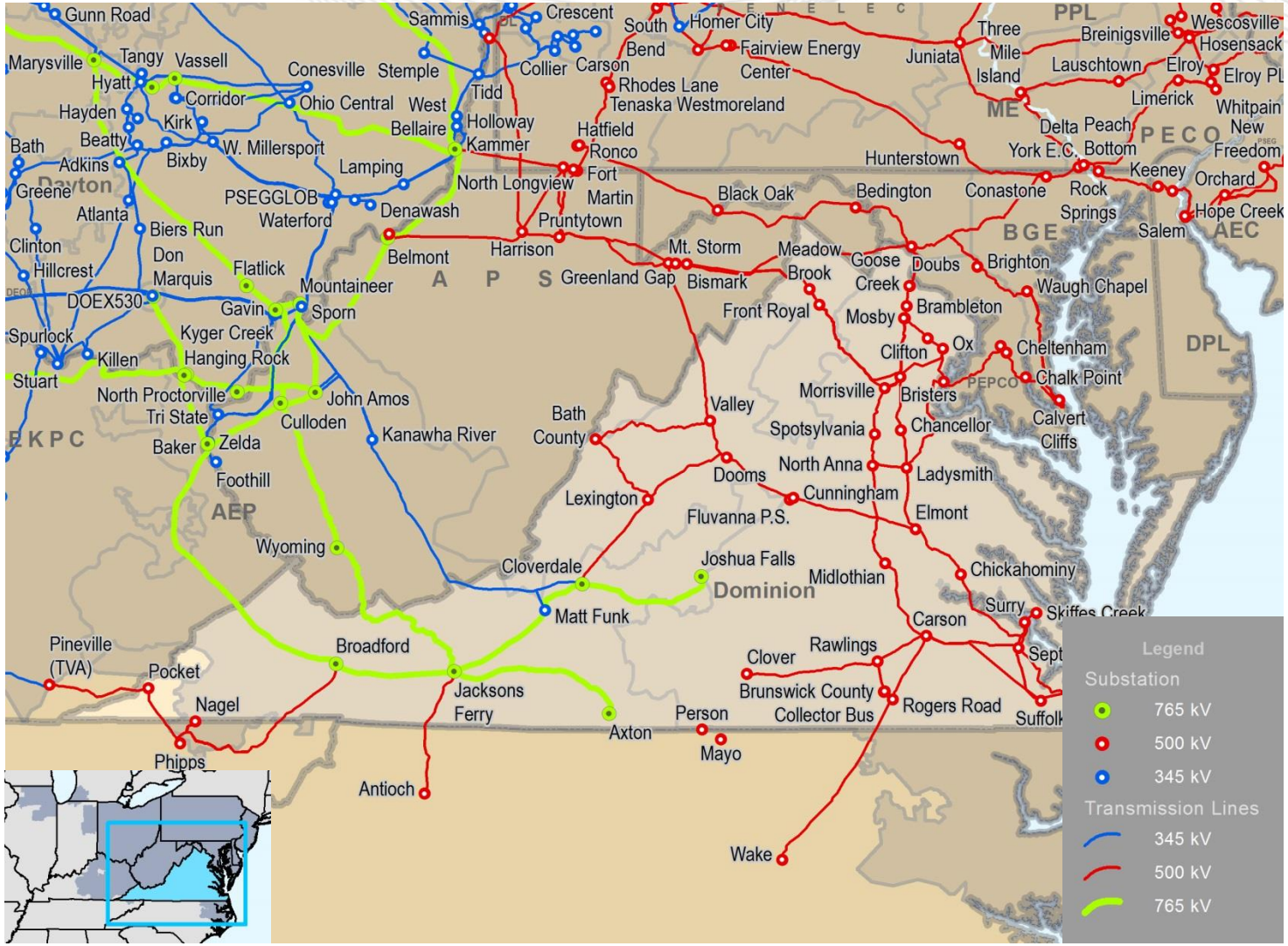
Executive Summary

(May 2019)

- **2021/22 Capacity Market:** Virginia cleared 920 MW more Demand Response and Energy Efficient resources than in the prior auction.
- **1/1/18 – 12/31/18 Performance:** Virginia's average locational marginal prices were at or above PJM average hourly LMPs. Natural gas resources represented 37.0 percent of generation produced in Virginia while nuclear averaged 24.1 percent.
- **Emissions:** 2018 carbon dioxide, sulfur dioxide, and nitrogen oxide emissions are all slightly up from 2017.

PJM Service Area – Virginia

(March 2019)

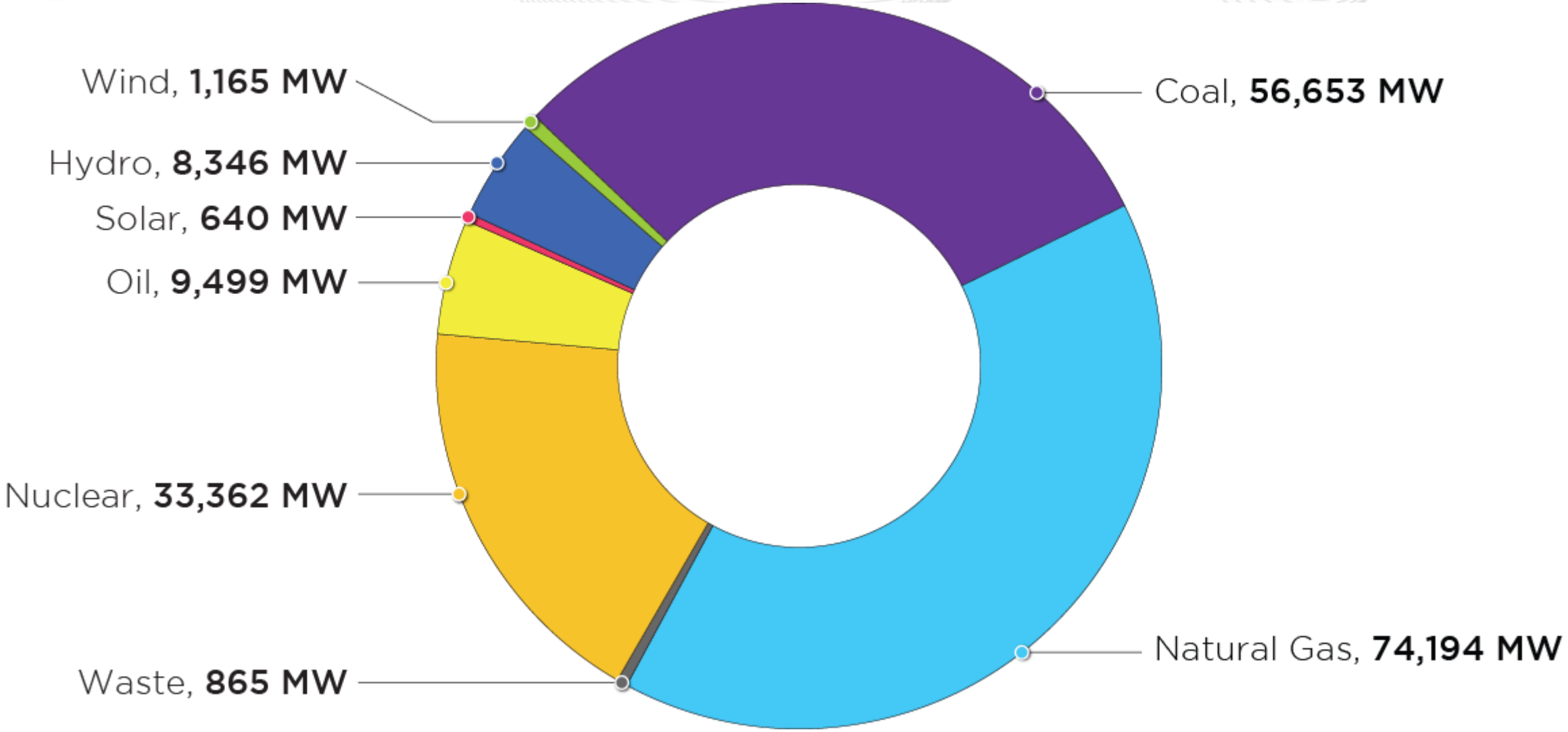


Planning

Generation Portfolio Analysis

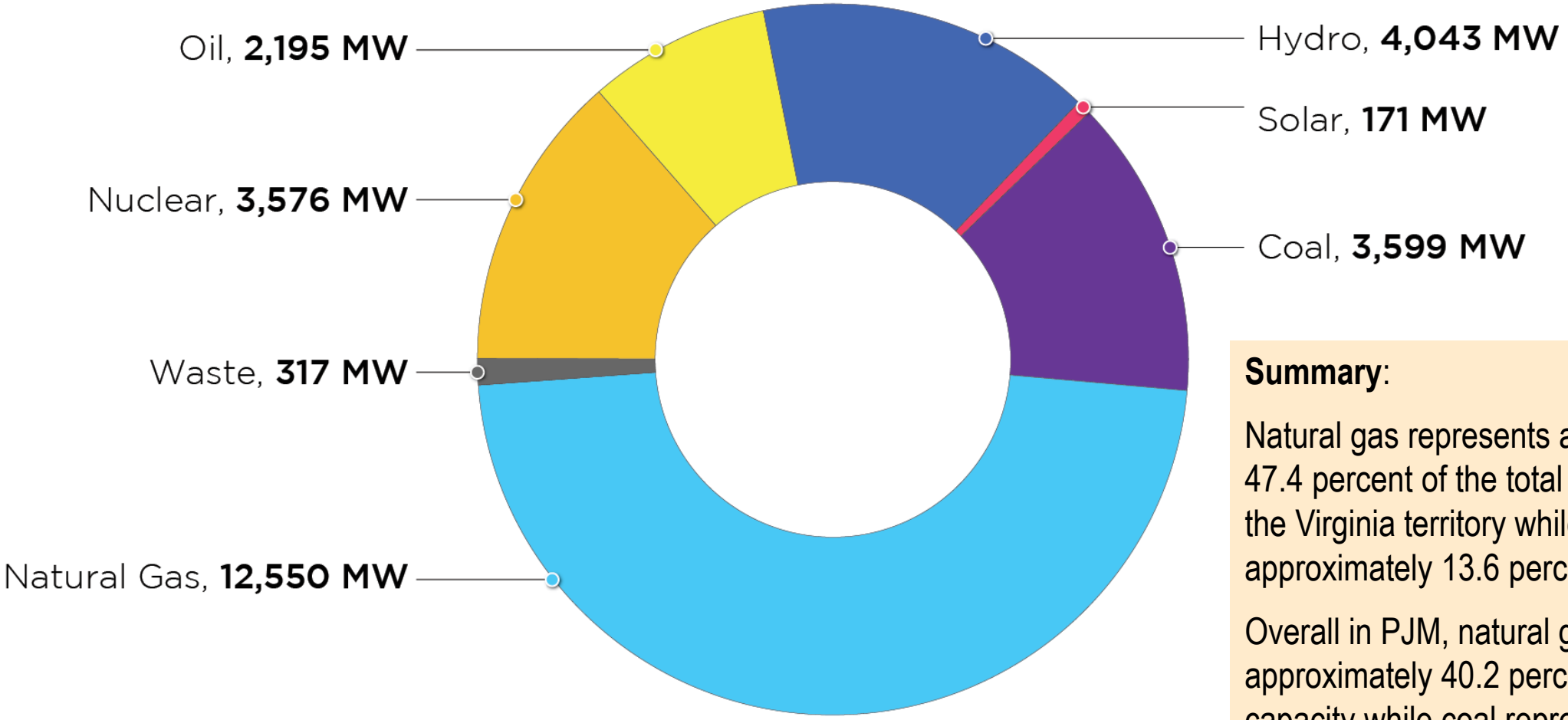
PJM Existing Installed Capacity

(CIRs, December 31, 2018)



Virginia – Existing Installed Capacity

(MW submitted to PJM, December 31, 2018)



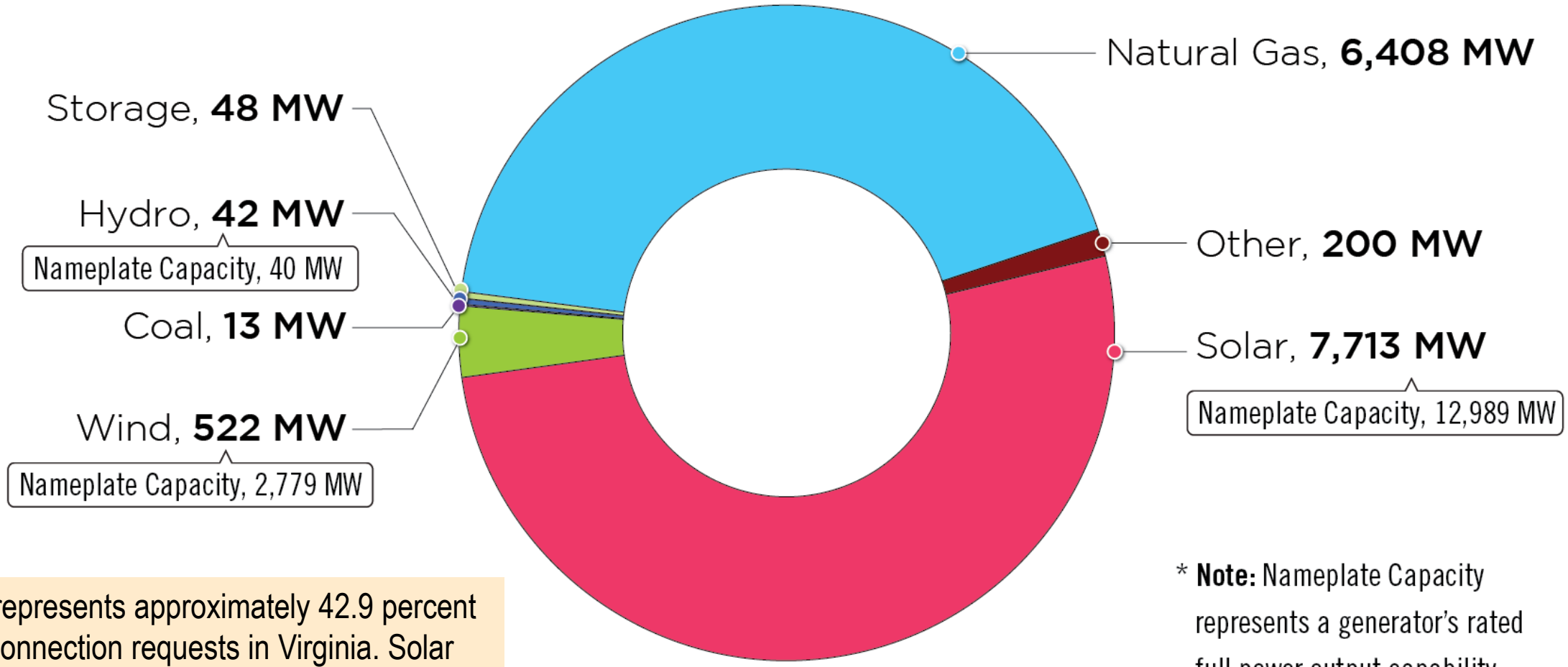
Summary:

Natural gas represents approximately 47.4 percent of the total installed capacity in the Virginia territory while coal represents approximately 13.6 percent.

Overall in PJM, natural gas represents approximately 40.2 percent of installed capacity while coal represents 30.7 percent.

Virginia – Queued Capacity (MW) by Fuel Type

(as of December 31, 2018)

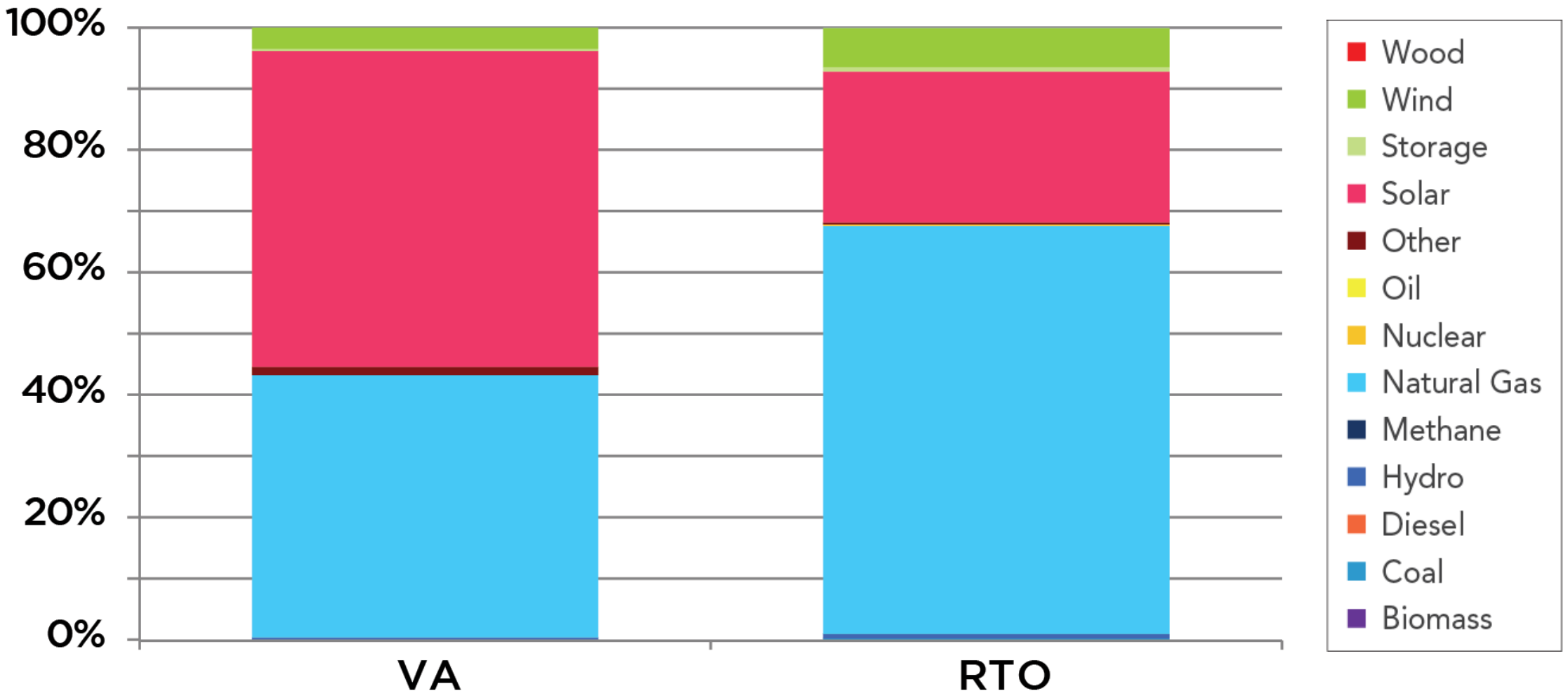


* **Note:** Nameplate Capacity represents a generator's rated full power output capability.

Natural gas represents approximately 42.9 percent of new interconnection requests in Virginia. Solar represents 51.6 percent of requests.

Virginia – Percentage of Projects in Queue by Fuel Type

(as of December 31, 2018)



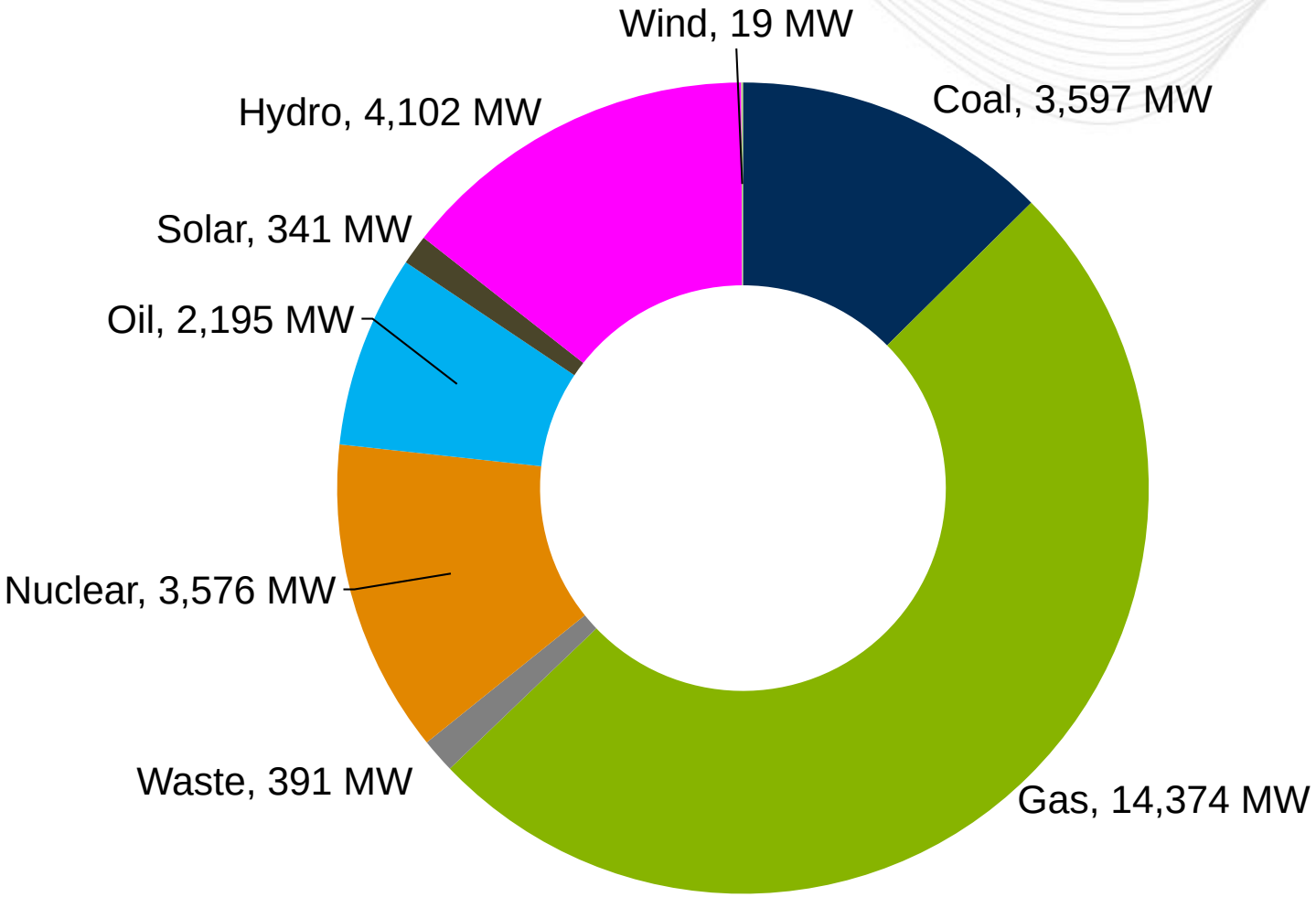
Virginia – Interconnection Requests

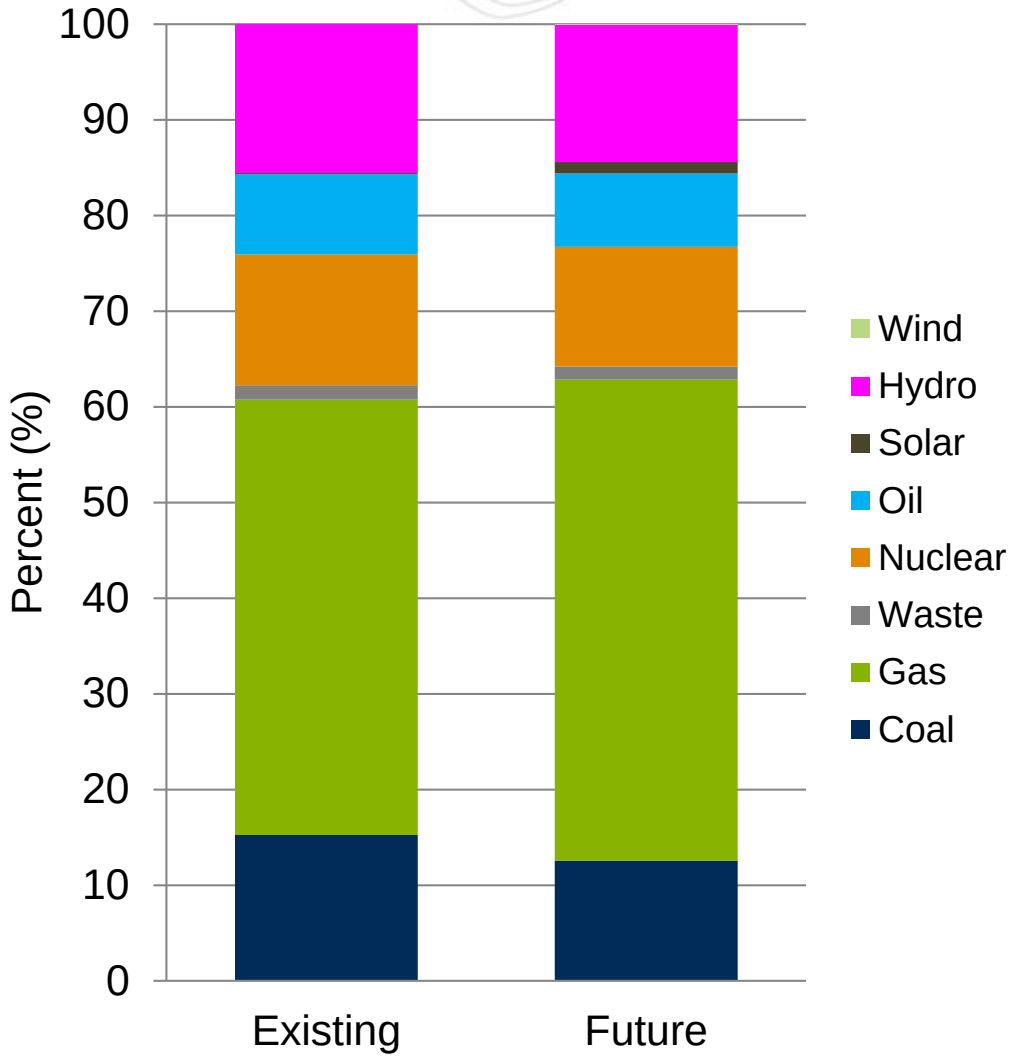
(Unforced Capacity, As of December 31, 2018)

	Complete				In Queue						Grand Total	
	In Service		Withdrawn		Active		Suspended		Under Construction			
	No. of Projects	Capacity, MW	No. of Projects	Capacity, MW	No. of Projects	Capacity, MW	No. of Projects	Capacity, MW	No. of Projects	Capacity, MW	No. of Projects	Capacity, MW
Non-Renewable	**65**	**6,912.8**	**49**	**17,356.0**	**17**	**3,895.7**	**1**	**0.0**	**6**	**2,773.2**	**138**	**30,937.7**
Coal	8	705.7	2	35.0	0	0.0	0	0.0	1	13.2	11	753.9
Diesel	2	2.1	2	20.2	0	0.0	0	0.0	0	0.0	4	22.3
Natural Gas	40	5,532.8	35	15,542.0	13	3,647.7	0	0.0	4	2,760.0	92	27,482.5
Nuclear	8	350.0	1	1,570.0	0	0.0	0	0.0	0	0.0	9	1,920.0
Oil	6	322.2	2	40.0	0	0.0	0	0.0	0	0.0	8	362.2
Other	1	0.0	2	136.3	1	200.0	0	0.0	0	0.0	4	336.3
Storage	0	0.0	5	12.5	3	48.0	1	0.0	1	0.0	10	60.5
Renewable	**50**	**842**	**156**	**4,175.0**	**147**	**7,677.0**	**5**	**26.0**	**36**	**576.0**	**394**	**13,296.0**
Biomass	5	147.4	4	70.0	0	0.0	0	0.0	0	0.0	9	217.4
Hydro	6	381.5	2	254.0	1	2.4	0	0.0	2	39.5	11	677.4
Methane	15	104.6	11	81.8	0	0.0	0	0.0	1	2.2	27	188.6
Solar	23	204.8	110	3,303.9	142	7,181.3	3	6.9	31	525.3	309	11,222.3
Wind	0	0.0	27	407.9	4	493.5	2	19.3	2	9.1	35	929.7
Wood	1	4.0	2	57.0	0	0.0	0	0.0	0	0.0	3	61.0
Grand Total	**115**	**7,755.2**	**205**	**21,530.5**	**164**	**11,572.9**	**6**	**26.2**	**42**	**3,349.3**	**532**	**44,234.1**

Virginia – Future Capacity Mix

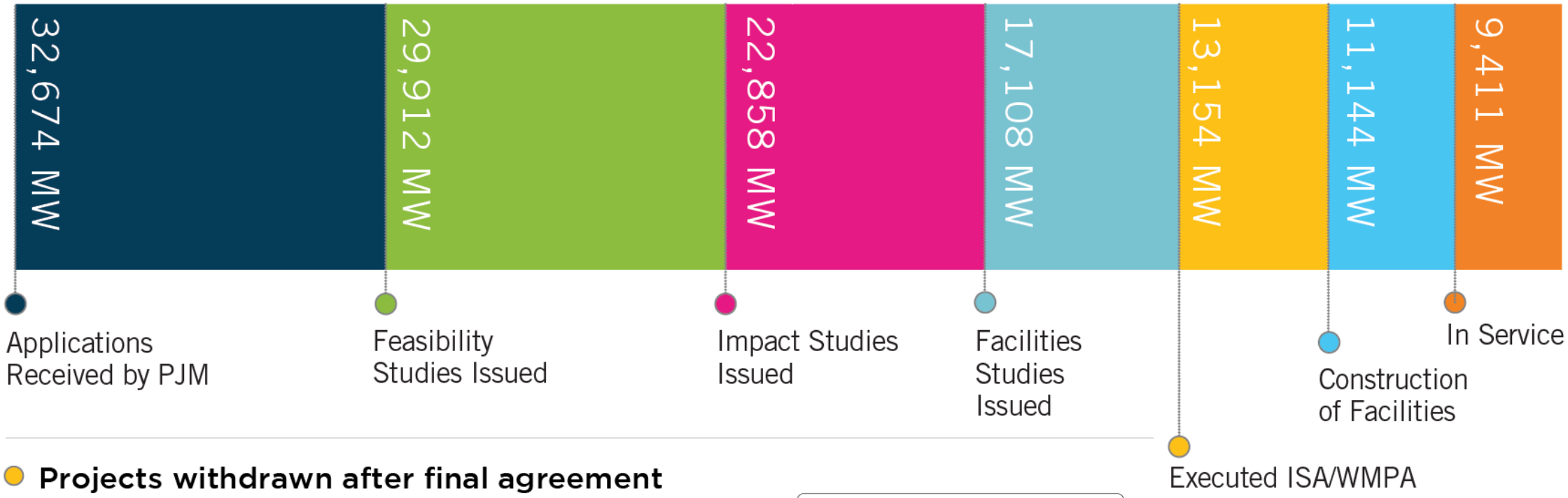
Based on known queued interconnection requests and deactivation notices through December 31, 2022, adjusted to reflect the probability of commercialization as indicated by historical trends specific to an interconnection request's state/zonal location and fuel type.





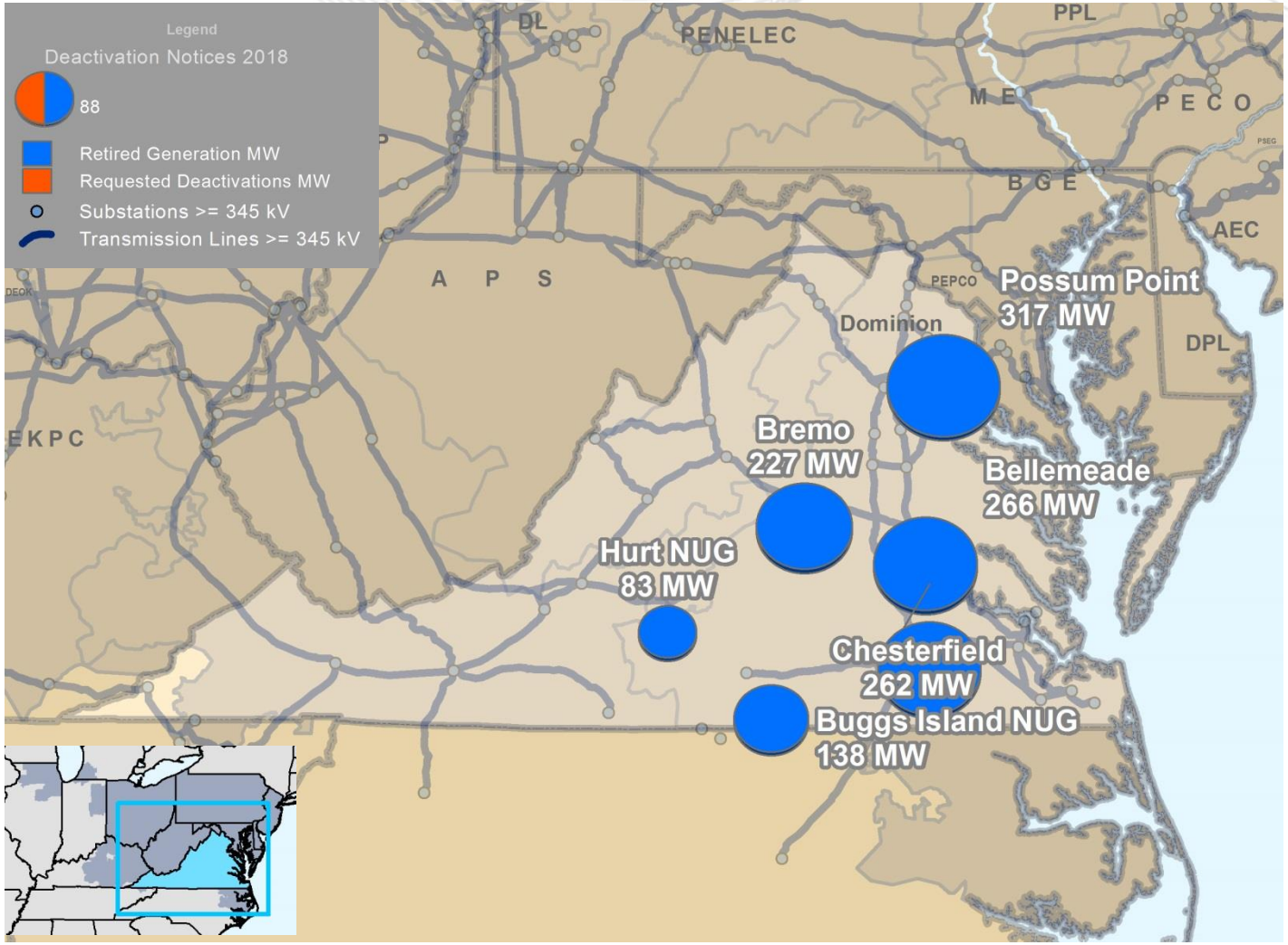
Virginia – Progression History Interconnection Requests

Projects under construction, suspended, in service, or withdrawn (as of December 31, 2018)



- **Projects withdrawn after final agreement**
  - 15 Interconnection Service Agreements – 1,934 MW (Nameplate Capacity, 2,275 MW)
  - 9 Wholesale Market Participation Agreements – 89 MW (Nameplate Capacity, 138 MW)
- **Percentage of planned capacity and projects reached commercial operation**
  - 28.8 % requested capacity megawatt
  - 32 % requested projects

Virginia – Actual Generation Deactivations and Deactivation Notifications Received in 2018



Virginia – Actual Generation Deactivations and Deactivation Notifications Received in 2018

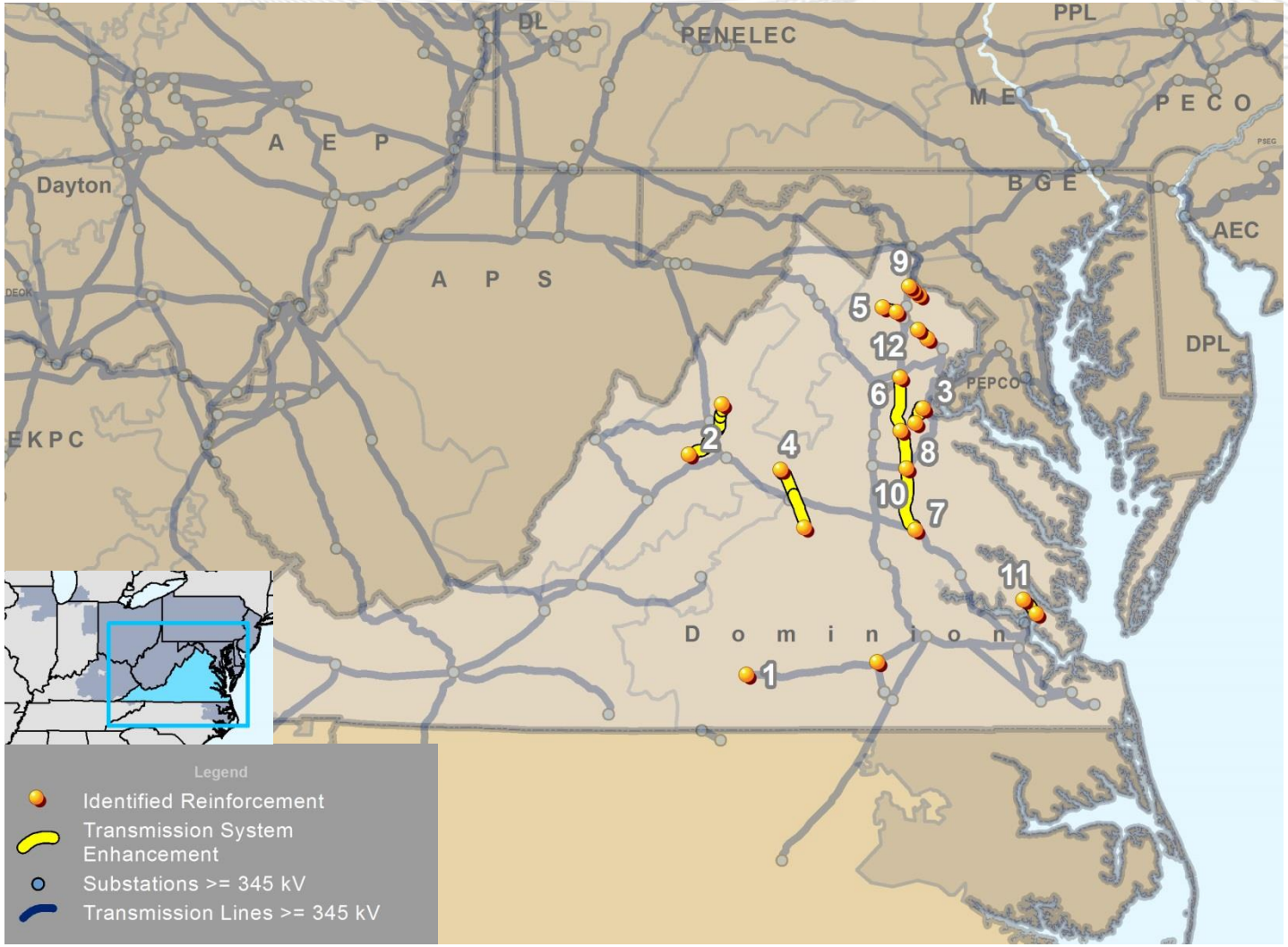
Unit	Capacity (MW)	TO Zone	Age (Years)	Projected/Actual Deactivation Date
Bellemeade	266	Dominion	21	4/16/2018
Possum Point 4	221	Dominion	56	12/13/2018
Chesterfield 4	162	Dominion	58	12/13/2018
Bremo 4	156	Dominion	60	4/16/2018
Chesterfield 3	100	Dominion	66	12/13/2018
Possum Point 3	97	Dominion	63	12/13/2018
Hurt NUG	83	Dominion	24	7/24/2018
Bremo 3	71	Dominion	68	4/16/2018
Buggs Island 1	69	Dominion	26	4/9/2018
Buggs Island 2	69	Dominion	26	4/9/2018

Planning

Transmission Infrastructure Analysis

Virginia – RTEP Baseline Projects

(Greater than $10 million)



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

Virginia – RTEP Baseline Projects

(Greater than $5 million)

Map ID	Project	Sub ID	Description	Required In-Service Date	Project Cost ($M)	TO Zone	2018 TEAC Review	Generator Deactivation	Operational Performance	TO Criteria Violation
1	b2978		Install two 125 MVAR STATCOMs at Rawlings substations and one 125 MVAR STATCOM at Clover 500 kV substations	5/31/2021	$100	Dominion	12/14/2017		X	
2	b2980		Rebuild 22.8 miles of 115 kV Line No. 43 between Staunton and Harrisonburg to current standards with a summer emergency rating of 261 MVA at 115 kV	10/31/2022	$37.5	Dominion	12/18/2017			X
3	b2981		Rebuild 115kV Line No. 29 segment between Fredericksburg and Aquia Harbor to current 230 kV standards (operating at 115 kV) utilizing steel H-frame structures with 2-636 ACSR to provide a normal continuous summer rating of 524 MVA at 115 kV (1047 MVA at 230kV)	12/31/2022	$12.5	Dominion	12/18/2017			X
4	b2989		Install a second 230/115 kV transformer (224 MVA) approximately one mile north of Bremo substation and tie 230 kV Line No. 2028 (Bremo-Charlottesville) and 115 kV Line No. 91 (Bremo-Sherwood) together. A three breaker 230 kV ring bus will split Line No. 2028 into two lines and Line No. 91 will also be split into two lines with a new three breaker 115 kV ring bus. Install a temporary 230/115 kV transformer at Bremo substation for the interim until the new substation completes.	6/1/2018	$27	Dominion	4/5/2018	X		
5	b3018		Rebuild New Road and Middleburg substations with single circuit steel structures to current 115 kV standards with a minimum summer emergency rating of 261 MVA	12/31/2021	$13.8	Dominion	6/7/2018			X
6	b3019		Rebuild 21.6 miles of 500 kV Bristers-Chancellor.	6/1/2018	$64.65	Dominion	6/7/2018			X
7	b3020		Rebuild 26.2 miles of 500 kV Ladysmith-Elmont.	6/1/2018	$87	Dominion	6/7/2018			X
8	b3021		Rebuild 15.2 miles of 500 kV Ladysmith-Chancellor.	6/1/2018	$45.6	Dominion	6/7/2018			X

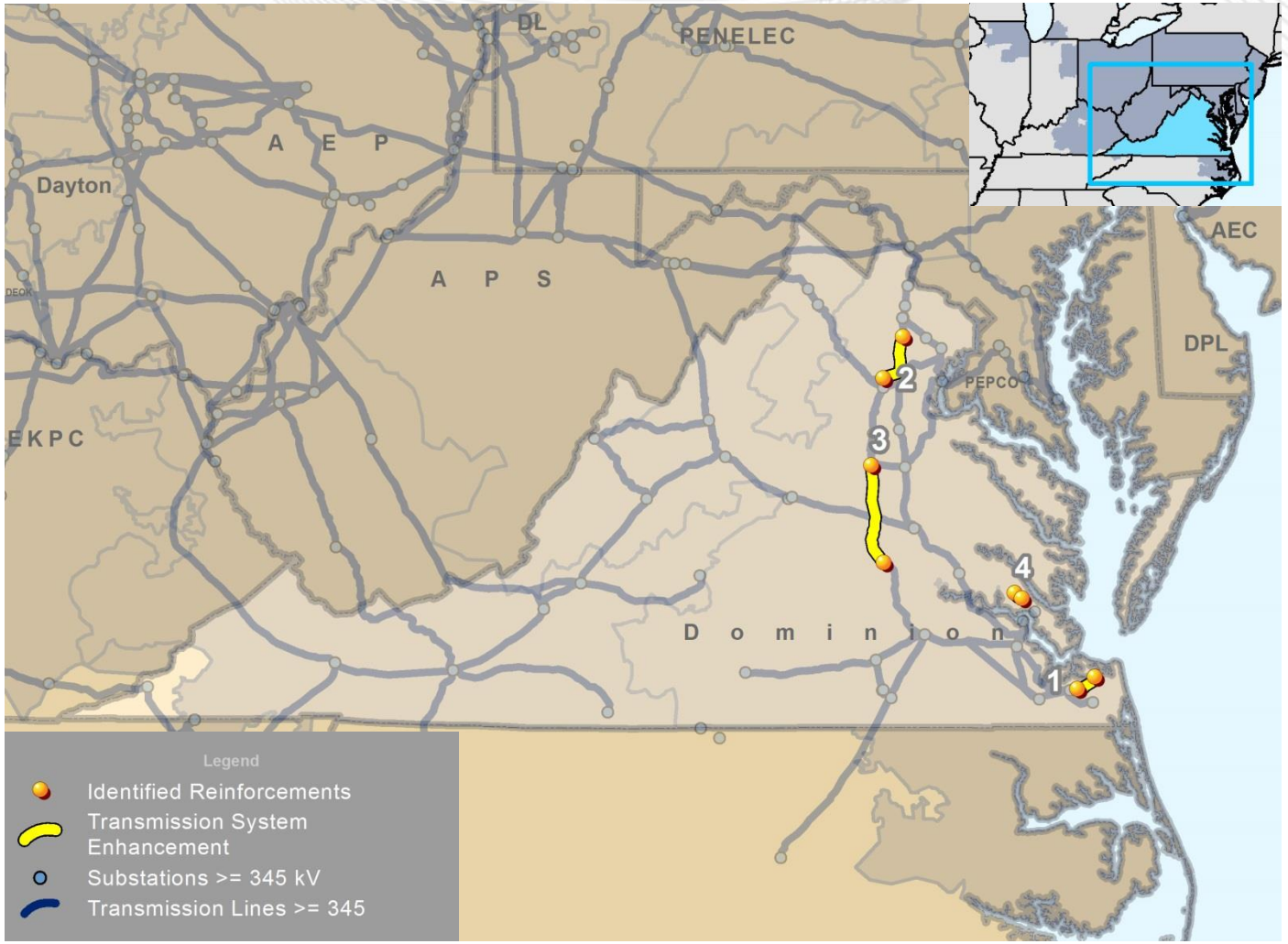
Virginia – RTEP Baseline Projects (cont.)

(Greater than $5 million)

Map ID	Project	Sub ID	Description	Required In-Service Date	Project Cost ($M)	TO Zone	2018 TEAC Review	Baseline Load Growth Deliverability & Reliability	Short Circuit	TO Criteria Violation
9	b3026		Re-conductor 230 kV (Pleasant View-Ashburn-Beaumeade) with a minimum rating of 1200 MVA. Also upgrade terminal equipment.	6/1/2021	$10	Dominion	8/9/2018	X		
10	b3027	0.1	Add a second 500/230 kV 840 MVA transformer at Dominion Ladysmith substation	6/1/2021	$23.44	Dominion	8/9/2018	X		
		0.2	Re-conductor Ladysmith and Ladysmith CT substations to increase the line rating from 1047 MVA to 1,225 MVA	6/1/2021		Dominion	8/9/2018	X		
		0.3	Replace the Ladysmith 500kV breaker "H1T581" with 50 kA breaker	6/1/2021		Dominion	10/11/2018		X	
		0.4	Update the nameplate for Ladysmith 500 kV breaker "H1T575" to be 50 kA breaker	6/1/2021		Dominion	10/11/2018		X	
		0.5	Update the nameplate for Ladysmith 500 kV breaker "568T574" (will be renumbered as "H2T568") to be 50 kA breaker	6/1/2021		Dominion	10/11/2018		X	
11	b3057		Rebuild 6.1 miles of Waller-Skiffess Creek 230 kV Line (No. 2154) between Waller and Kings Mill to current standards with a minimum summer emergency rating of 1047 MVA utilizing single circuit steel structures. Remove the section of Line No. 58 between Waller and Kings Mill. Rebuild the 1.6 miles of Kings Mill and Skiffes Creek.	6/1/2018	$10	Dominion	10/11/2018			X
12	b3058		Partial rebuild of 230 kV lines between Clifton and Johnson DP with double circuit steel structures using double circuit conductor at current 230 kV northern Virginia standards with a minimum rating of 1,200 MVA	6/1/2018	$11.5	Dominion	10/11/2018			X
	b2994		Acquire land and build a new switching station (Skippers) at the tap serving Brink DP with a 115 kV four breaker ring to split line No. 130 and terminate the end points.	5/1/2020	$8	Dominion	1/30/2018			X
	b3088		Rebuild 4.75 mile section of Line No. 26 between Lexington and Rockbridge with a minimum summer emergency rating of 261 MVA.	6/1/2018	$8	Dominion	11/29/2018			X

Virginia – RTEP Network Projects

(Greater than $10 million)



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.

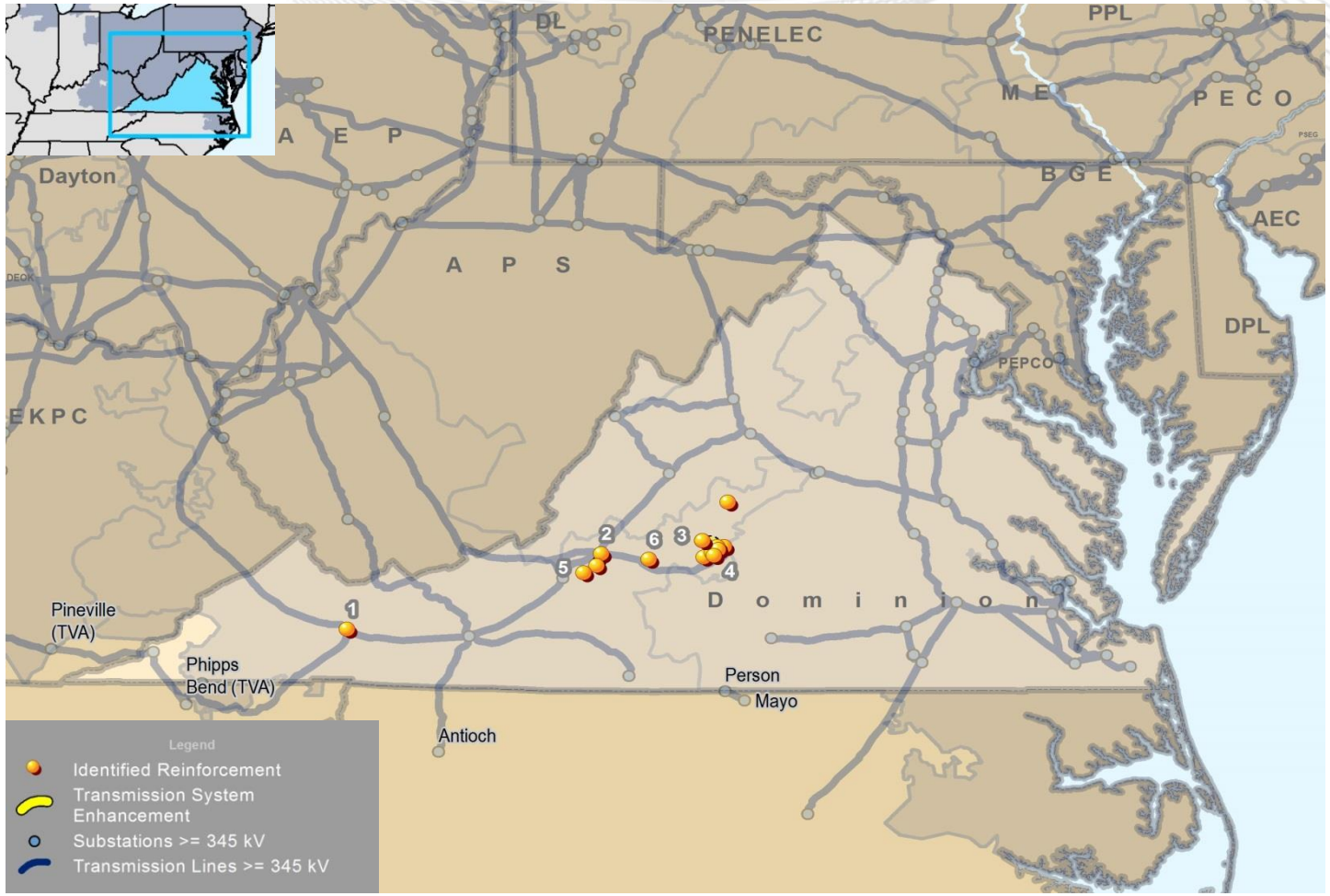
Virginia – RTEP Network Projects

(Greater than $5 million)

Map ID	Project	Description	Project Driver	Queue	Required In-Service Date	Project Cost ($M)	TO Zone	2018 TEAC Review
1	n5606	Wreck and rebuild 11 miles of Chesapeake-Greenwich 230 kV	Generation	AC2-012 (Solar)	12/31/2019	$26.5	Dominion	9/13/2018
2	n5938	Wreck and rebuild the Waller-Lightfoot 230 kV line	Generation	AC1-159 (Natural Gas)	1/1/2021	$15.2	Dominion	9/13/2018
3	n5607	Elk Run-Gainsville 230 kV: reconductor 21 miles to increase its line rating to 1203 MVA (normal), 1203 MVA (emergency), and 1383 MVA (load shed).	Generation	AC2-102 (Solar)	12/31/2019	$28	Dominion	9/13/2018
4	n5609	Midlothian-North Anna 500 kV: wreck and rebuild the line of 41 miles increase its line rating to 4453 MVA (normal), 4453 MVA (emergency), and 5121 MVA (load shed).	Generation	AC2-141 (Solar)	12/1/2021	$123.39	Dominion	9/13/2018
	n5497	Build a new AB2-174 switching station	Generation	AB2-174 (Solar)	12/15/2018	$5.5	Dominion	9/13/2018
	n5500	Install a new transformer at the Clubhouse substation	Generation	AB2-174 (Solar)	12/15/2018	$9	Dominion	9/13/2018
	n5612	Line No. 153 AC1-076 Tap – Paytes DP 115 kV: wreck and rebuild the line of 3 miles to increase its line rating to 262 MVA (normal), 287 MVA (emergency), and 349 MVA (load dump). It is estimated to cost $6,500,000 and 24-36 months to engineer, permit and construct. A Va CPCN is required.	Generation	AC2-102 (Solar)	6/30/2019	$6.5	Dominion	9/13/2018
	n5614	Build a three breaker ring at the new AB2-134 substation	Generation	AB2-134 (Solar)	4/28/2018	$6.57	Dominion	9/13/2018
	n5645	Raise four 115 kV lines outside of the Chesapeake substation and replace a 230 kV line span	Generation	AB2-051 (Natural Gas)	3/31/2021	$5.41	Dominion	9/13/2018
	n5665	Build three breaker ringbus at AB2-077 / 078 / 079 switching station	Generation	AB2-077 (Solar)	12/31/2017	$5.18	Dominion	9/13/2018
	n5941	Build New AC1-080three breaker ring bus Switching Substation (interconnection substation)	Generation	AC1-080 (Solar)	6/1/2018	$5.6	Dominion	9/13/2018
	n5945	Build New AC1-121 three breaker ring bus Switching Substation (interconnection substation)	Generation	AC1-121 (Solar)	6/1/2019	$5.6	Dominion	9/13/2018

Virginia – TO Supplemental Projects

(Greater than $10 million)



Note: Supplemental projects are transmission expansions or enhancements that are not required for compliance with the following PJM criteria: system reliability, operational performance or economic criteria, pursuant to a determination by the Office of the Interconnection and is not a state public policy project.

Virginia – TO Supplemental Projects

(Greater than $5 million)

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	2018 TEAC Review
1	s1462	Replace existing 765/138 kV 600 MVA transformer no. 1 with a new 765/138 kV 750 MVA transformer. Replace 765/500 kV 1500 MVA transformer No. 4 with a new 765/500 kV 1500 MVA transformer. Install one new 765 kV 50 kA circuit breaker. Install two new 765 kV 50 kA circuit breakers, all at Broadford 765 kV switchyard.	8/6/2021	$102	AEP	1/11/2018
		Replace six existing 138 kV circuit breakers with six new. Install three new 138 kV 63 kA circuit breakers in newly constructed string. Replace existing 138 kV 40 kA circuit breaker with a new 138 kV 40 kA breaker. Replace existing 138 kV reactor with a new model.	3/23/2022		AEP	1/11/2018
2	s1581	At Cloverdale station, replace all four single-phase 500 MVA 765/345 kV transformers with new AEP standard 750 MVA/phase units. Transformer no. 10 will be moved into a new string between two existing circuit breakers.	12/18/2020	$54.7	AEP	3/8/2018
		Replace 90 MVA 138/69/34 kV transformer no. 1 with a 130 MVA unit relocated into a new string between two existing circuit breakers.	12/18/2020		AEP	3/8/2018
		Retire a 138/69/34kV transformer. Retire a 34 kV circuit breaker, the Huntington Court 34.5 kV line, and associated 34 kV bus equipment.	12/18/2020		AEP	3/8/2018
		Add two 138 kV circuit breakers (3000 A, 63 kA) in order to bring the newly energized 138 kV Mt Union line into a new string position.	12/18/2020		AEP	3/8/2018
		Replace a 69 kV circuit breaker with new circuit breaker.	12/18/2020		AEP	3/8/2018
		Replace the Cloverdale – Huntington Court 138 kV line relays. Replace the Cloverdale – Roanoke 138 kV line relay. Replace Cloverdale – Mount Union 69 kV line relays.	12/18/2020		AEP	3/8/2018
		Replace 138 kV station service transformer.	12/18/2020		AEP	3/8/2018
		Replace a 41 kA 765 kV circuit breaker with new 63 kA breaker. Retire two 765 kV circuit breakers.	12/18/2020		AEP	3/8/2018
		Install new 138/69 kV 130 MVA transformer at Mount Union station and retire 138/69/34 kV 75 MVA transformer No. 4 at Cloverdale Station. Replace Cloverdale – Mount Union 69 kV line relays.	12/18/2020		AEP	3/8/2018

Virginia – TO Supplemental Projects (cont.)

(Greater than $5 million)

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	2018 TEAC Review
3	s1443	Install a new 138 kV bus at Opossum Creek and replace condenser units.	2/19/2019	$47.7	AEP	1/8/2018
		Replace seven 138 kV circuit breakers at Opossum Creek. Complete the circuit breaker string for the East Lynchburg exit and the new condenser unit. Complete the circuit breaker string for the Smith Mountain and Reusens lines. Replace two circuit switchers.	2/20/2019		AEP	1/8/2018
		Create a new 138 kV bus for the condenser unit no. 2 at Opossum Creek. Create a new 138 kV bus for the condenser unit no. 1. Install a spare transformer. Remove both 34.5 kV buses and transformers. Install station service off of the 138 kV bus.	2/19/2019		AEP	1/8/2018
		Change relay settings at South Lynchburg and Joshua Falls. At East Lynchburg, Smith Mountain and Peaksview, relay work will be needed.	12/31/2018		AEP	1/8/2018
4	s1668	At Joshua Falls, retire the existing 138 kV yard at Joshua Falls station and build a new one in the clear.	12/28/2021	$40.7	AEP	6/26/2018
		Construct 0.25 miles of aluminum conductor steel cable (operated at 138kV) connecting the Joshua Falls 765 kV station to the new 138 kV yard.	3/31/2021		AEP	6/26/2018
		Install 0.25 miles of aluminum conductor steel cable connecting the Gomingo – Joshua Falls line to the new 138 kV yard.	6/30/2021		AEP	6/26/2018
		Install 0.4 miles of double-circuited aluminum conductor steel cable connecting the Opossum Creek and Easy Lynchburg lines to the new 138 kV yard.	6/30/2021		AEP	6/26/2018
		At East Lynchburg, install a new 138 kV circuit breaker towards Opossum Creek. Replace the existing circuit breaker with a 138 kV circuit breaker. Install a new circuit breaker on the 69 kV station exit. Replace the existing 34.5 kV circuit breaker. Install a new station service transformer on the 138 kV bus and replace the existing 34.5 kV station service transformer. Retire capswitcher and 57.6 MVAR capacitor bank.	3/21/2021		AEP	6/26/2018

Virginia – TO Supplemental Projects (cont.)

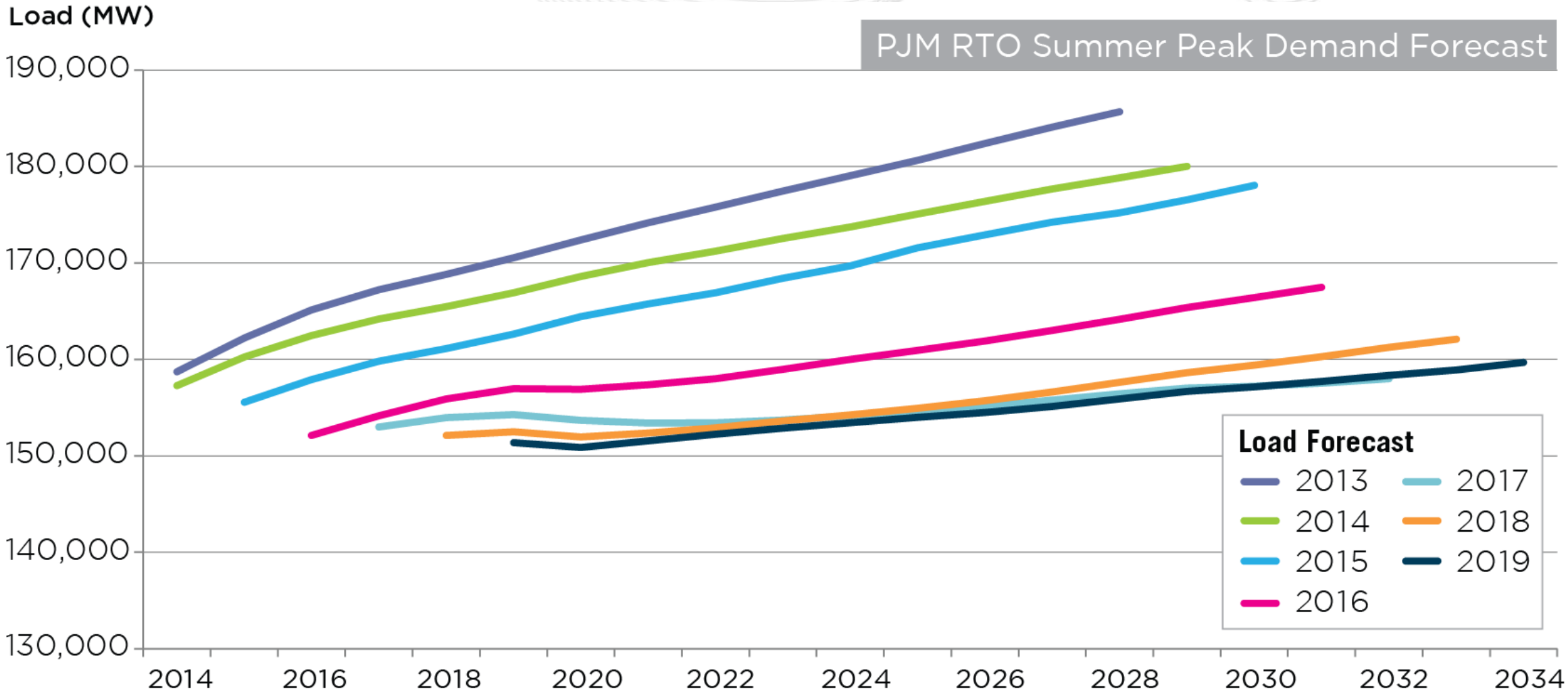
(Greater than $5 million)

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	2018 TEAC Review
5	**s1598**	At Hancock station, build a new 138 kV breaker-and-a-half configuration. Install nine new 3000 A/40 kA circuit breakers. Replace a total of four existing circuit breakers with 3000 A/40 kA circuit breakers. Replace three existing circuit breakers with new 1200 A/25 kA models. Install new drop-in control module. Replace transformer no. 2 with new model. Add new transformer with high-side circuit switcher. Replace the existing circuit switcher with new 31.5 kA circuit switcher. Replace capacitor voltage transformers. Replace two 34.5 kV circuit breakers with new 34.5 kV, 40 kA circuit breakers. Replace 34.5 kV capacitor bank circuit switcher with new 40 kA circuit switcher. Install bus regulators on 34.5 kV bus. Replace remote end line relaying.	12/18/2021	$30	AEP	3/27/2018
6	**s1607**	At Reusens station, replace two existing circuit breakers with new 40 kA models. Replace two existing transformers with new 138/34.5 kV 130 MVA transformers. Add three new circuit switchers on the high side of their respective transformers. Replace existing cap switcher with new 650 A 31.5 kA cap switcher. Replace existing cap switcher with new 15 kA cap switcher. Install a new 40 kA 69 kV circuit breaker to the low side of transformer no. 4. Replace three existing 69 kV circuit breakers with new 40 kA circuit breakers. Replace the 138/69 kV 60 MVA transformer no. 4 with a new 138/70.5/13 kV 130 MVA transformer.	12/31/2022	$20.7	AEP	3/27/2018
		At Mosely station, replace existing 17.5 kA 138 kV circuit breaker with new 40 kA circuit breaker. Add a new 138 kV 40 kA line circuit breaker on the Roanoke exit. Replace existing 69 kV circuit breaker with new 40 kA circuit breaker. Replace the existing 61 kA grounding switch motor-operated air breaker with new 40 kA circuit switcher.	12/31/2022		AEP	3/27/2018
		At Clifford station, replace existing motor-operated air breaker with new 40 kA 138 kV circuit breaker on the Boxwood line exit. Replace grounding switch motor-operated air breaker with new 40 kA circuit switcher.	12/31/2022		AEP	3/27/2018

Planning
Load Forecast

PJM Annual Load Forecasts

(January 2019)



Virginia – 2019 Load Forecast Report

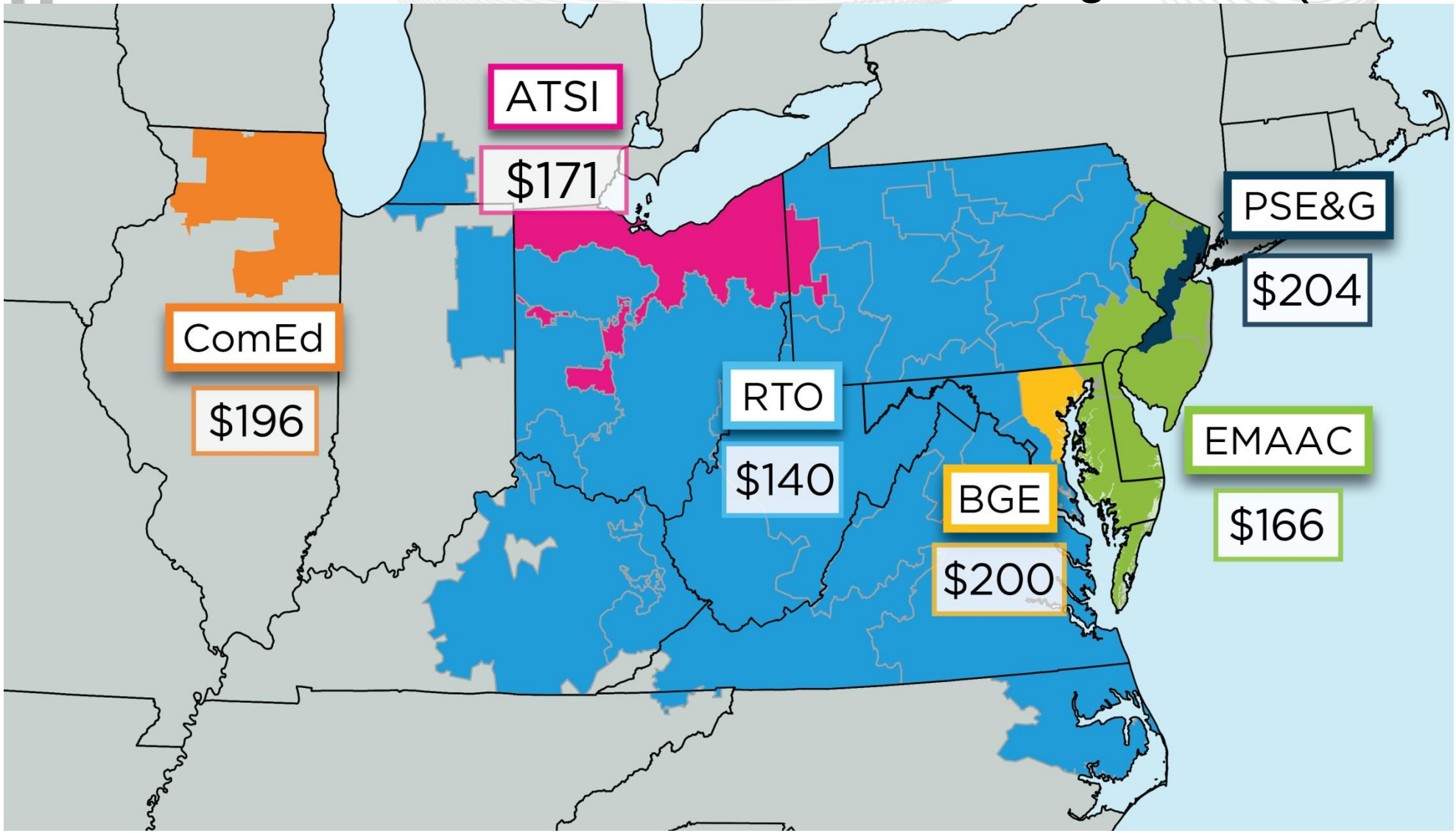
	Summer Peak (MW)			Winter Peak (MW)		
Transmission Owner	2019	2029	Growth Rate (%)	2018/19	2028/29	Growth Rate (%)
American Electric Power Company *	3,309	3,472	0.5%	4,200	4,397	0.5%
Allegheny Power *	654	699	0.7%	703	759	0.8%
Delmarva Power and Light *	142	143	0.1%	147	152	0.3%
Dominion Virginia Power *	18,437	20,193	0.9%	17,119	19,071	1.1%
PJM RTO	151,358	156,689	0.3%	131,082	136,178	0.4%

* PJM notes that American Electric Power Company, Delmarva Power and Light, Allegheny Power and Dominion Virginia Power serve load other than in Virginia. The Summer peak and Winter Peak MW values in this table each reflect the estimated amount of forecasted load to be served by each of those transmission owners solely in Virginia. Estimated amounts were calculated based on the average share of each transmission owner's real-time summer and winter peak load located in Virginia over the past five years.

Markets

Capacity Market Results

2021/22 Base Residual Auction Clearing Prices ($/MW-Day)



Virginia – Cleared Resources in 2021/22 Auction

(May 23, 2018)

	Cleared MW (Unforced Capacity)	Change from 2019/20 Auction
Generation	23,727	(1,144)
Demand Response	1,407	549
Energy Efficiency	565	371
Total	25,699	(223)

RTO Locational Clearing Price
$140

NOTE: Demand Response and Energy Efficiency are reported to PJM by Transmission Zone.
The numbers above reflect the state's pro-rata share of cross-state zones for illustrative purposes.

PJM – 2021/2022 Cleared MW (UCAP) by Resource Type

	Annual	Summer	Winter	Total
Generation	149,616 MW	54 MW	716 MW	150,385 MW
DR	10,674 MW	452 MW	- MW	11,126 MW
EE	2,623 MW	209 MW	- MW	2,832 MW
Total	162,912 MW	716 MW	716 MW	164,343 MW

Virginia – Offered and Cleared Resources in 2020/21 Auction

(May 23, 2017)

		Unforced Capacity
Generation	Offered MW	25,297
	Cleared MW	24,871
Demand Response	Offered MW	968
	Cleared MW	858
Energy Efficiency	Offered MW	294
	Cleared MW	193
Total Offered MW		26,558
Total Cleared MW		25,922

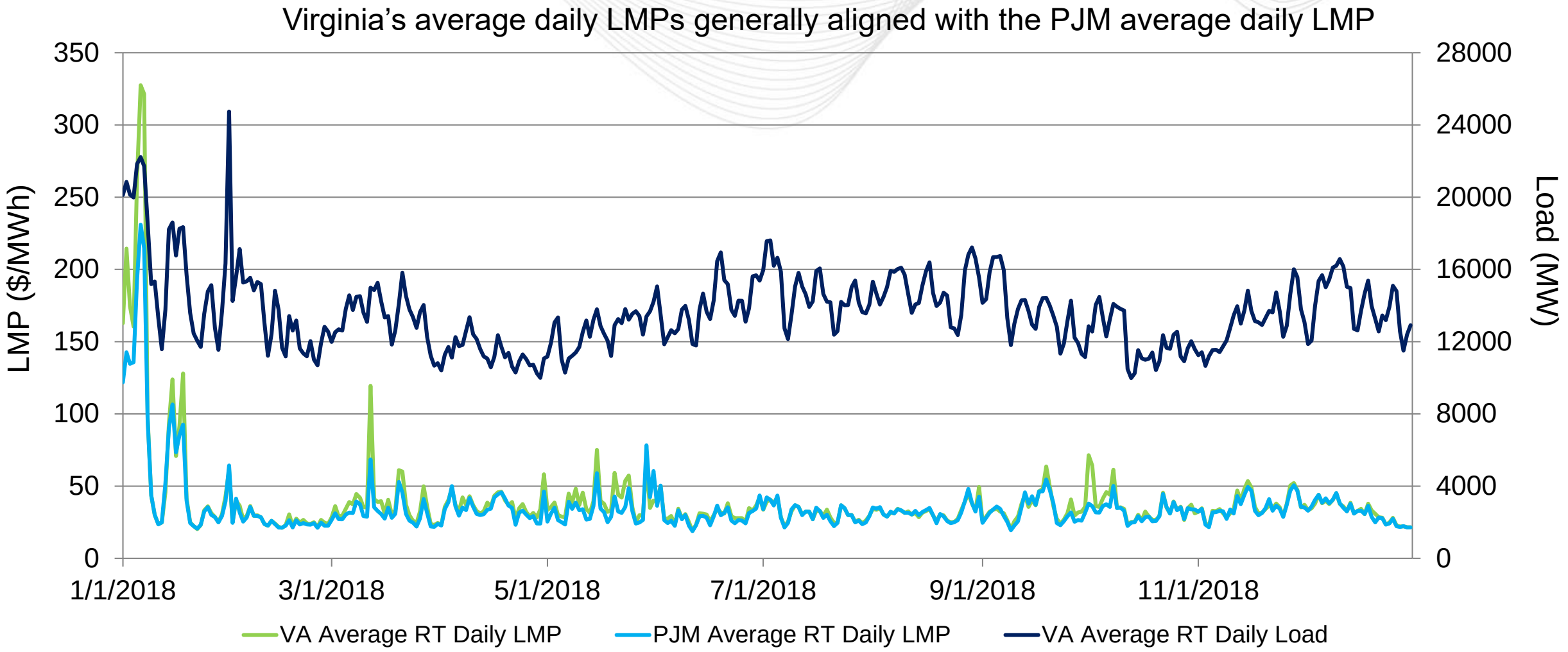
NOTE: Demand Response and Energy Efficiency are reported to PJM by Transmission Zone. The numbers above reflect the state's pro-rata share of cross-state zones for illustrative purposes.

Markets

Market Analysis

Virginia – Average Daily LMP and Load

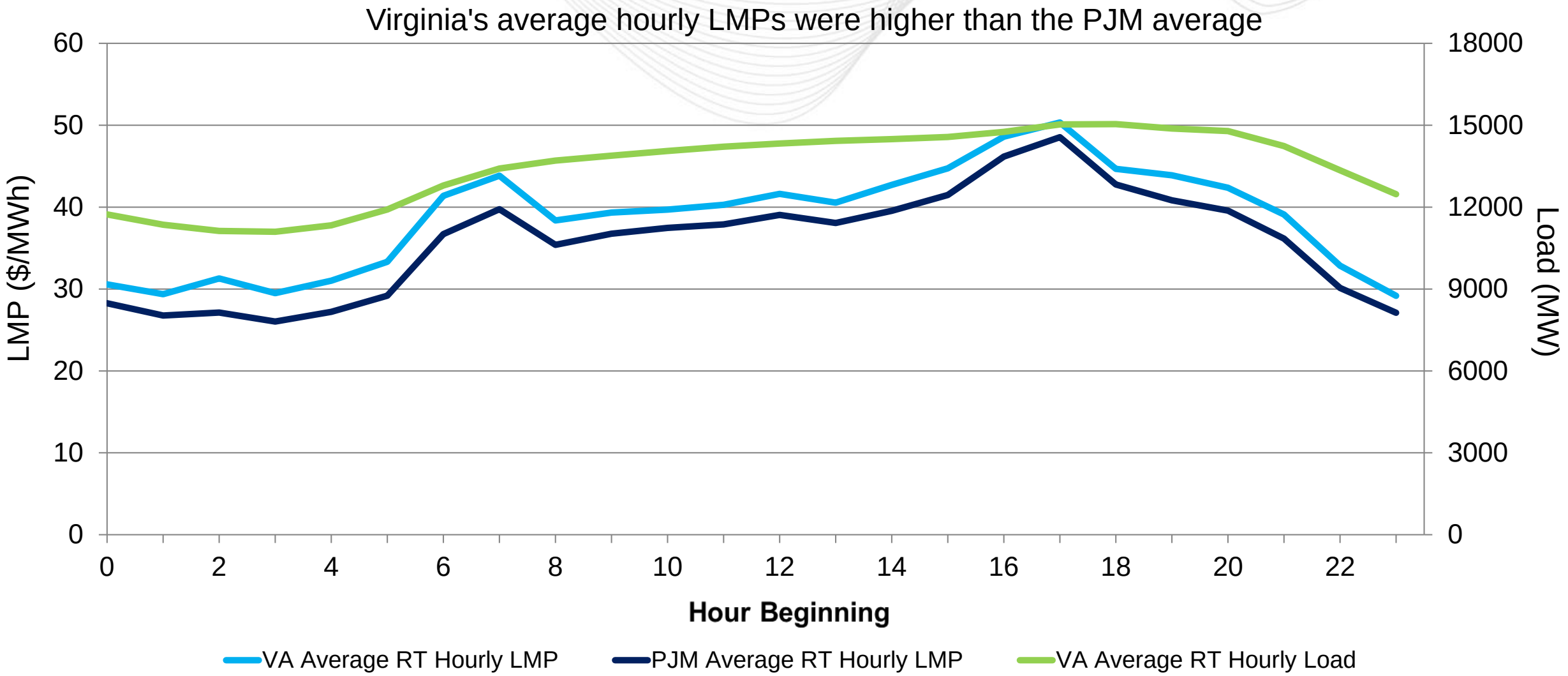
(January 1, 2018 – December 31, 2018)



Note: The price spike in January reflects the Cold Snap that lasted from 12/28/17 to 1/7/2018.

Virginia – Average Hourly LMP and Load

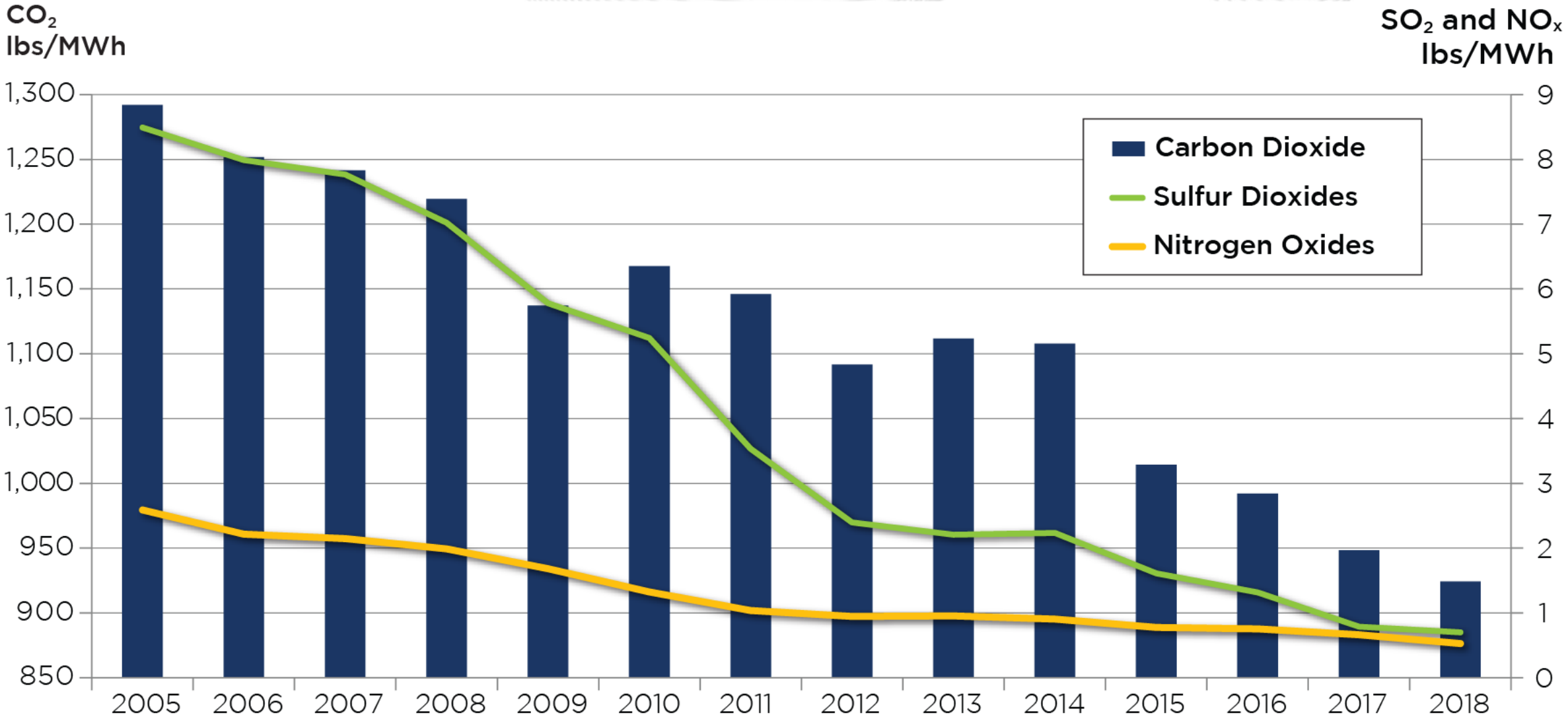
(January 1, 2018 – December 31, 2018)



Operations

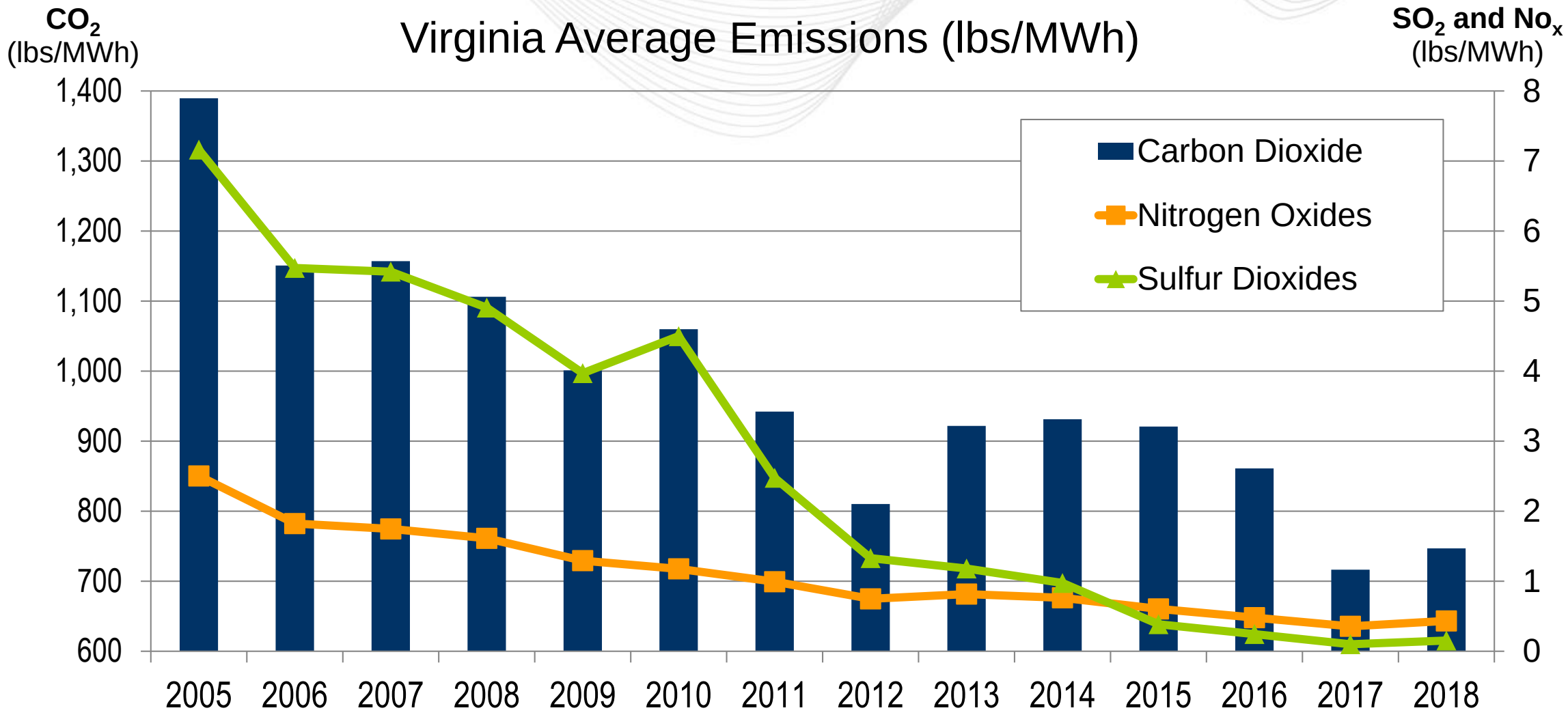
Emissions Data

2005-2018 PJM Average Emissions



Virginia – Average Emissions (lbs/MWh)

(February 4, 2019)



Appendix

Please note that PJM has historically used $5 million as the threshold for listing projects in the RTEP report. Beginning in 2018, it was decided to increase this cutoff to $10 million. All RTEP projects with costs totaling at least $5 million are still included in this state report.

For a complete list of all RTEP projects, including those below the RTEP threshold of $10 million, please visit the “RTEP Upgrades & Status – Transmission Construction Status” page on pjm.com.

https://www.pjm.com/planning/rtep-upgrades-status/construct-status.aspx