2021 Virginia Infrastructure Report

(January 1, 2021 – December 31, 2021)

May 2022

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

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- **Existing Capacity:** Natural gas represents approximately 50.4 percent of the total installed capacity in the Virginia service territory while hydro represents approximately 15.4 percent and nuclear 13.7 percent. In PJM natural gas and coal are 44.2 and 4.4 percent of total installed capacity, and nuclear represents 17.5 percent.
- **Interconnection Requests:** Solar represents 61.9 percent of new interconnection requests in Virginia, while storage represents approximately 31.9 percent of new requests.
- **Deactivations:** 21 MW of generation in Virginia gave notification of deactivation in 2021.
- **RTEP 2020:** Virginia's 2021 RTEP projects total approximately $1.56 billion in investment.

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- **Load Forecast:** Virginia's peak load growth is projected to range between 0.0 and 2.7 percent annually over the next ten years, based on the service territory. The overall PJM RTO projected load growth rate is 0.4 percent.
- **2022/23 Capacity Market:** 8,797 MW in Virginia cleared in the 2022/23 Base Residual Auction. The Dominion locational delivery area participated in the Fixed Resource Requirement for the 2022/23 auction, which reduced the amount of generation located in Virginia available for the 2022/23 auction in comparison to previous capacity auctions.
- **1/1/21 – 12/31/21 Market Performance:** Virginia's average hourly LMPs were above the PJM average hourly LMP.
- **Emissions:** Virginia's average CO2 emissions decreased in 2021 compared to 2020 levels.

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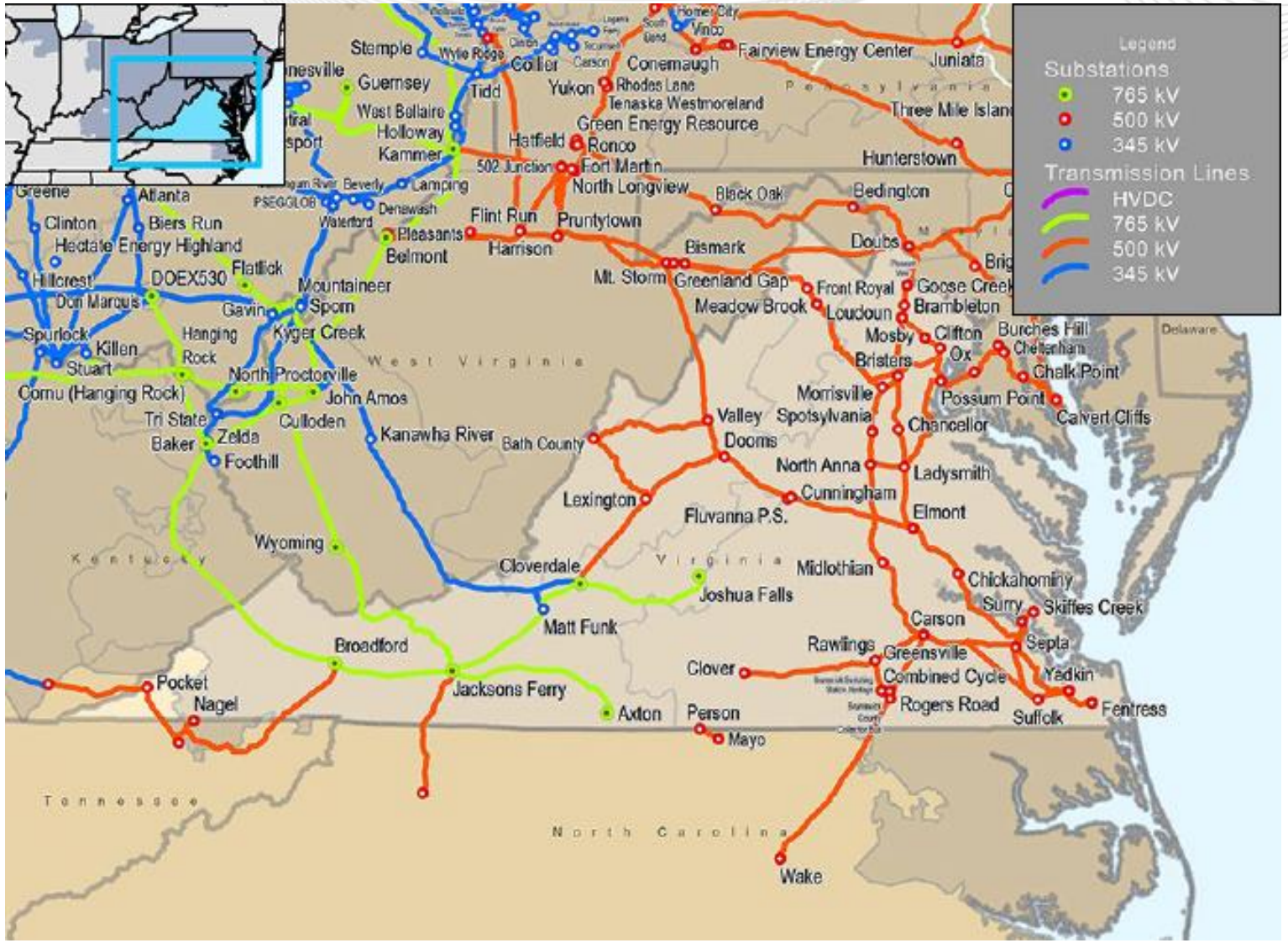
PJM Service Area – Virginia



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Generation Portfolio Analysis

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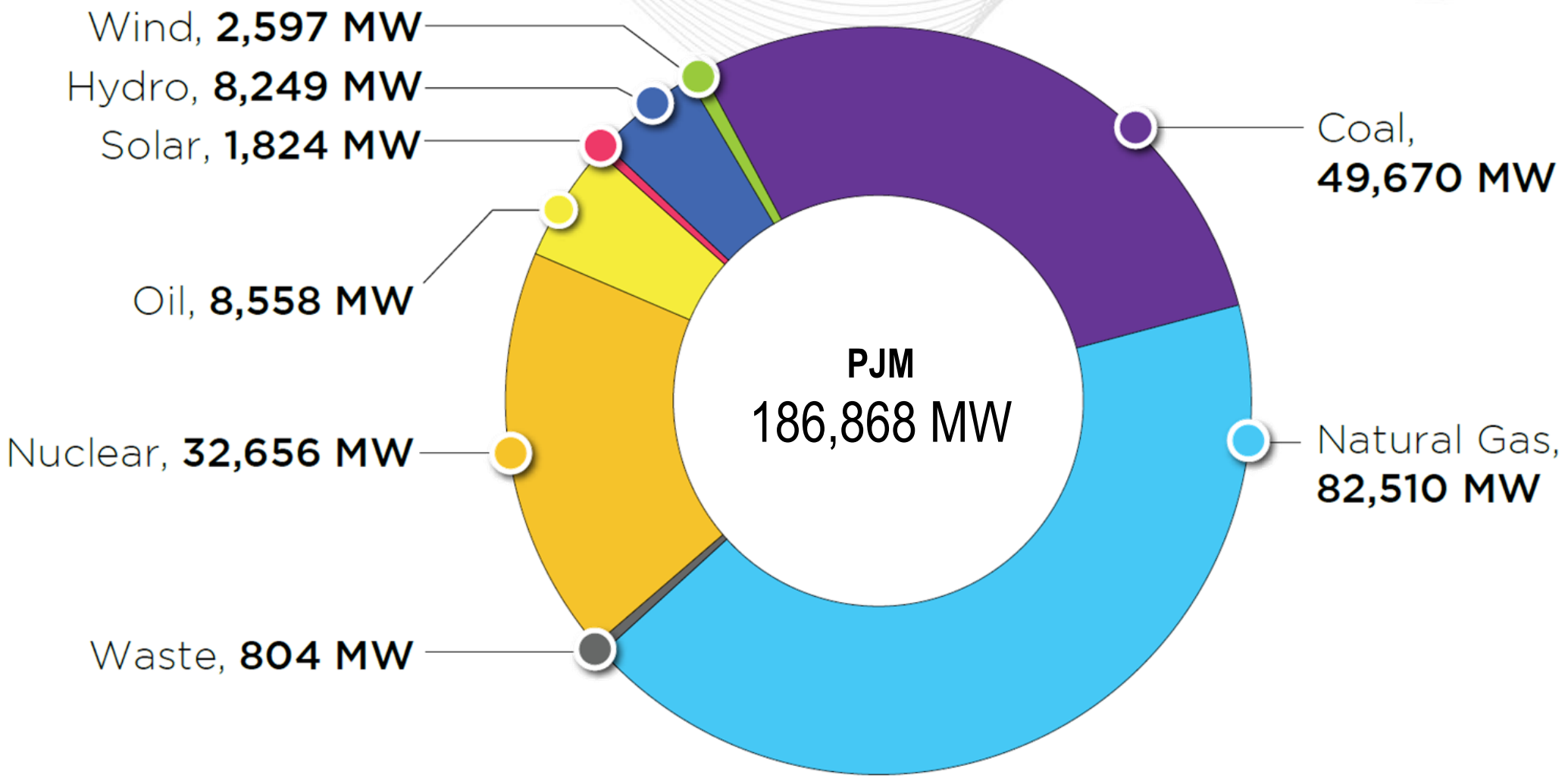
PJM – Existing Installed Capacity

(CIRs – as of Dec. 31, 2021)



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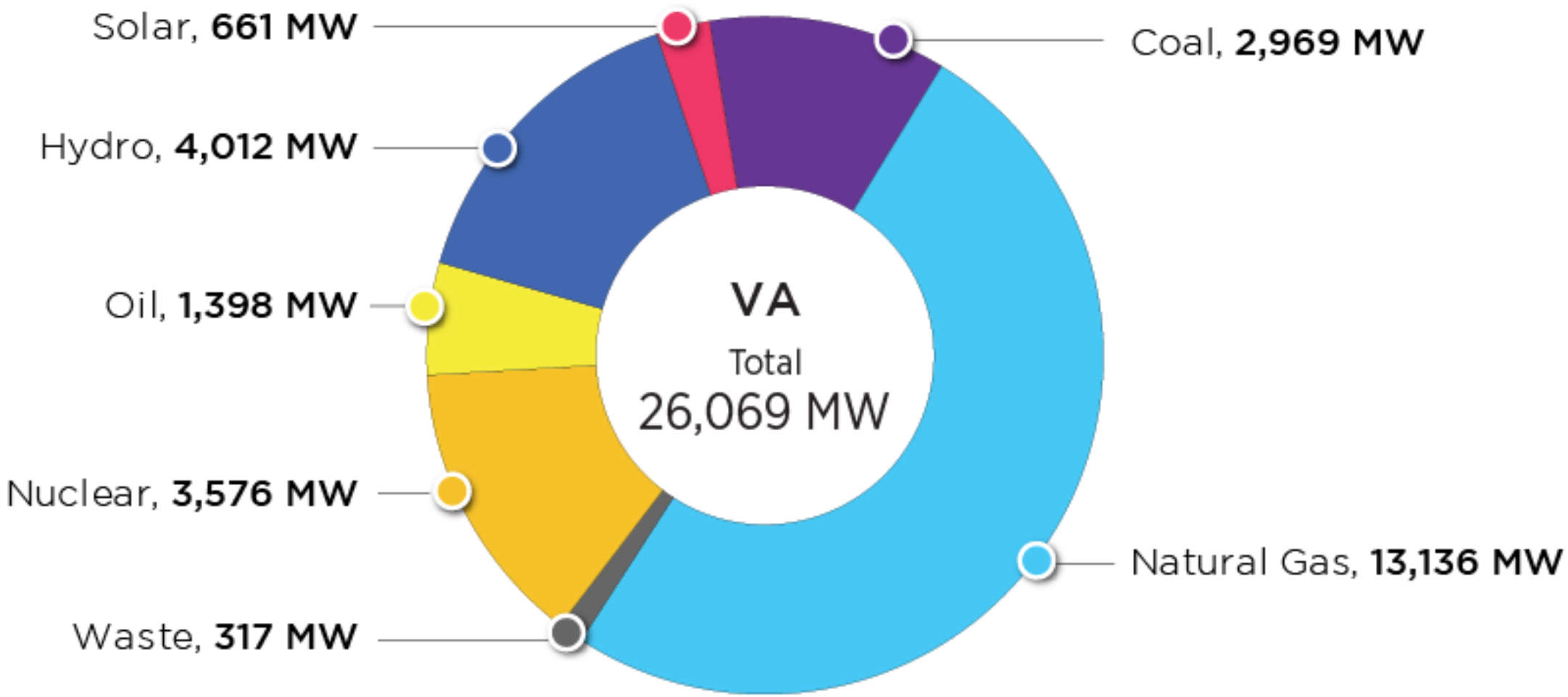
Virginia – Existing Installed Capacity

(CIRs – as of Dec. 31, 2021)



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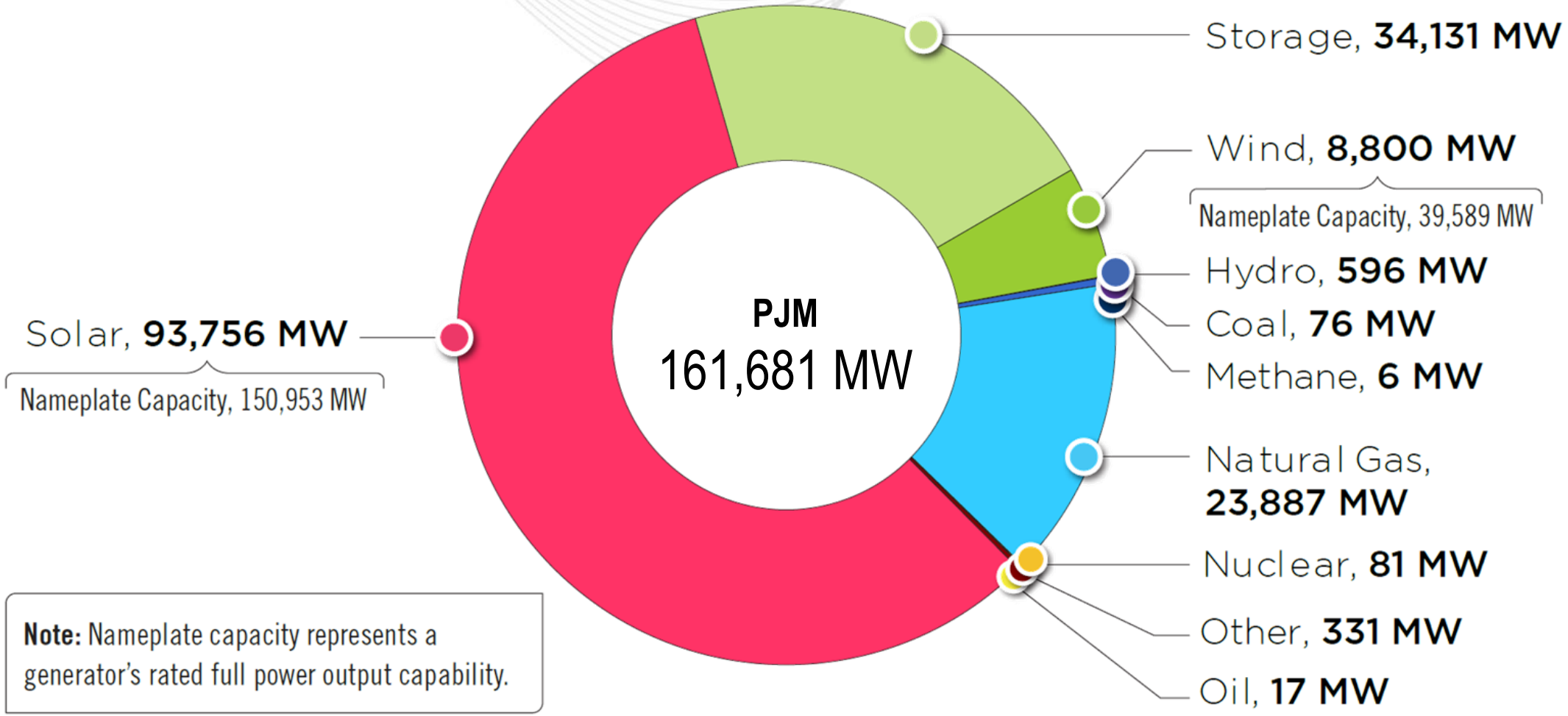
PJM – Queued Capacity (MW) by Fuel Type

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



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

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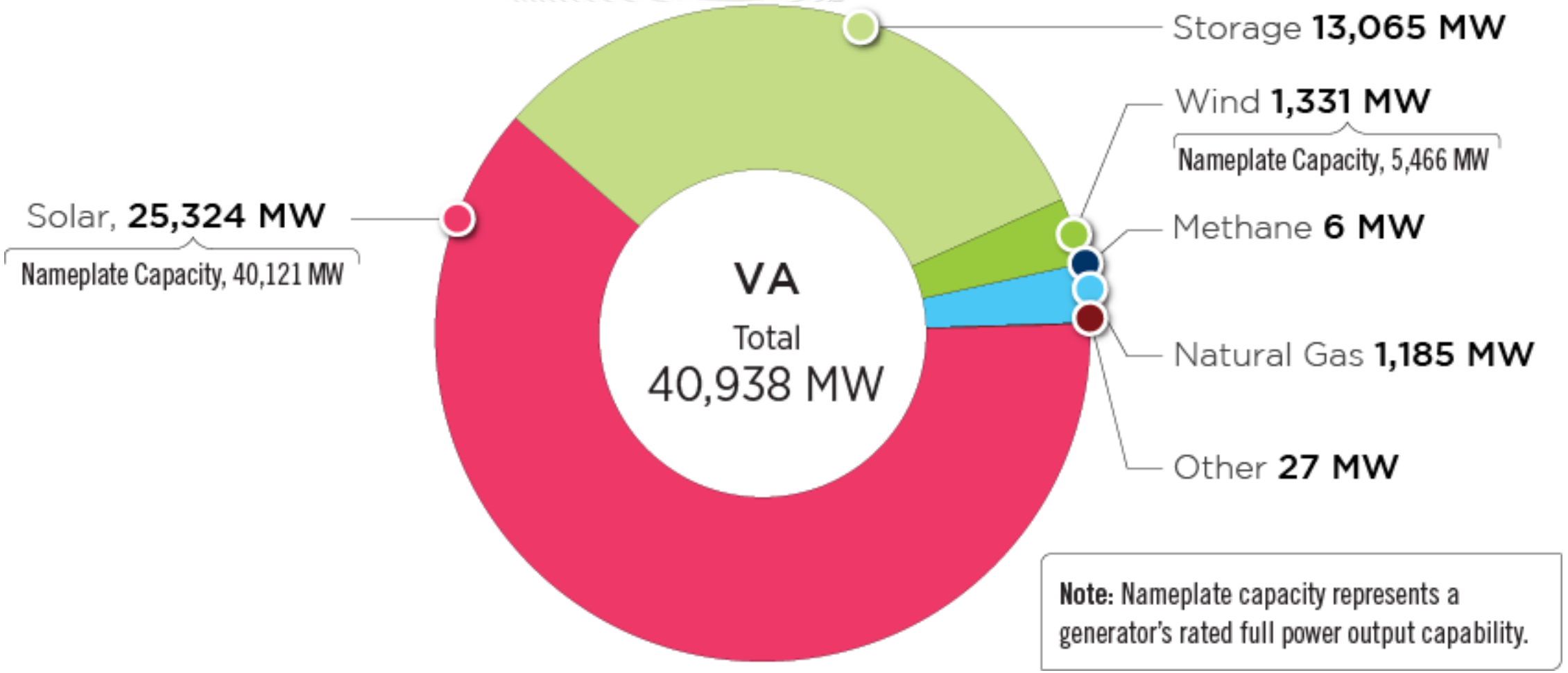
Virginia – Queued Capacity (MW) by Fuel Type

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



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Virginia – Historical Interconnection Requests by Fuel Type

(as of Dec. 31, 2021)

		In Queue						Complete					
		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	8	718.9	2	35.0	10	753.9
	Diesel	0	0.0	0	0.0	0	0.0	2	2.1	2	20.2	4	22.3
	Natural Gas	7	1,185.4	0	0.0	0	0.0	48	7,288.4	46	20,389.8	101	28,863.6
	Nuclear	0	0.0	0	0.0	0	0.0	8	350.0	1	1,570.0	9	1,920.0
	Oil	0	0.0	0	0.0	0	0.0	6	322.2	2	40.0	8	362.2
	Other	4	27.1	0	0.0	0	0.0	1	0.0	2	136.3	7	163.4
	Storage	208	13,005.4	0	0.0	5	60.0	1	0.0	30	1,190.1	244	14,255.6
Renewable	Biomass	0	0.0	0	0.0	0	0.0	5	147.4	4	70.0	9	217.4
	Hydro	0	0.0	0	0.0	0	0.0	9	423.4	2	254.0	11	677.4
	Methane	1	6.0	0	0.0	0	0.0	16	106.8	11	81.8	28	194.6
	Solar	416	22,679.2	8	317.4	77	2,327.7	42	694.6	236	7,675.4	779	33,694.2
	Wind	9	1,321.4	0	0.0	1	9.9	1	1.5	32	895.5	43	2,228.3
	Wood	0	0.0	0	0.0	0	0.0	1	4.0	2	57.0	3	61.0
	Grand Total	**645**	**38,224.5**	**8**	**317.4**	**83**	**2,397.6**	**148**	**10,059.3**	**372**	**32,415.1**	**1,256**	**83,413.9**

Note: The ”Under Construction” column includes both “Engineering and Procurement” and “Under Construction” project statuses.

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Virginia – Progression History of Interconnection Requests

Percentage of planned capacity and projects that have reached commercial operation

24.2%	Requested capacity megawatts
26.0 %	Requested projects

			Capacity	Nameplate
Projects withdrawn after final agreement	19	Interconnection Service Agreements	4,626 MW	5,067 MW
	39	Wholesale Market Participation Agreements	368 MW	612 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.

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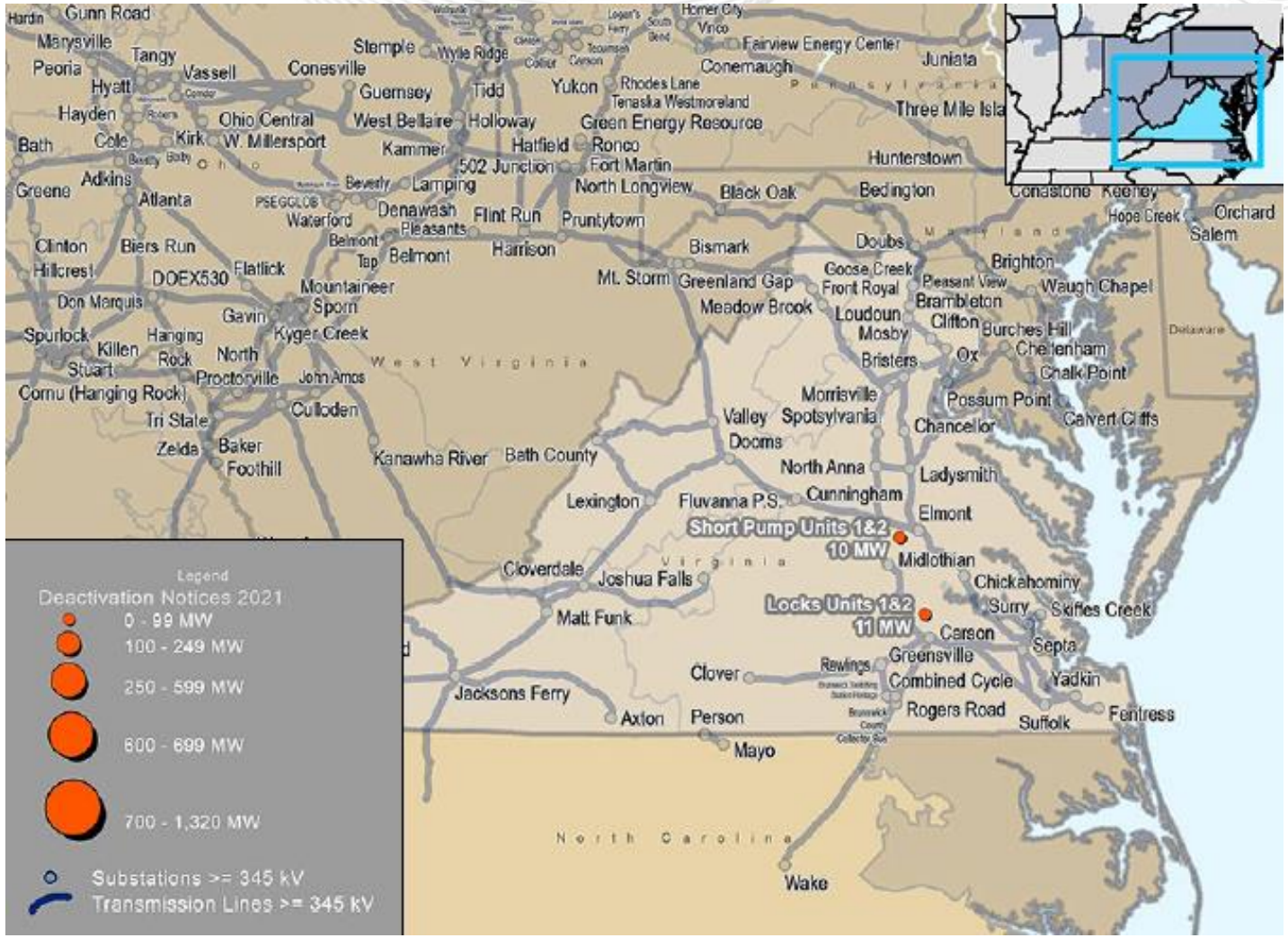
Virginia – Generation Deactivation Notifications Received in 2021



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Virginia – Generation Deactivation Notifications Received in 2021

Unit	TO Zone	Fuel Type	Request Received to Deactivate	Actual or Projected Deactivation Date	Age (Years)	Capacity (MW)
Rockville CT (Short Pump 2)	Dominion	Diesel	9/29/2021	6/1/2023	26	4
Lanier 1 CT (Short Pump 1)					21	7
Weakley CT (Locks 2)					21	7
DINWIDDIE 1 CT (Locks 1)					28	3

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Transmission Infrastructure Analysis

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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/planning/project-construction

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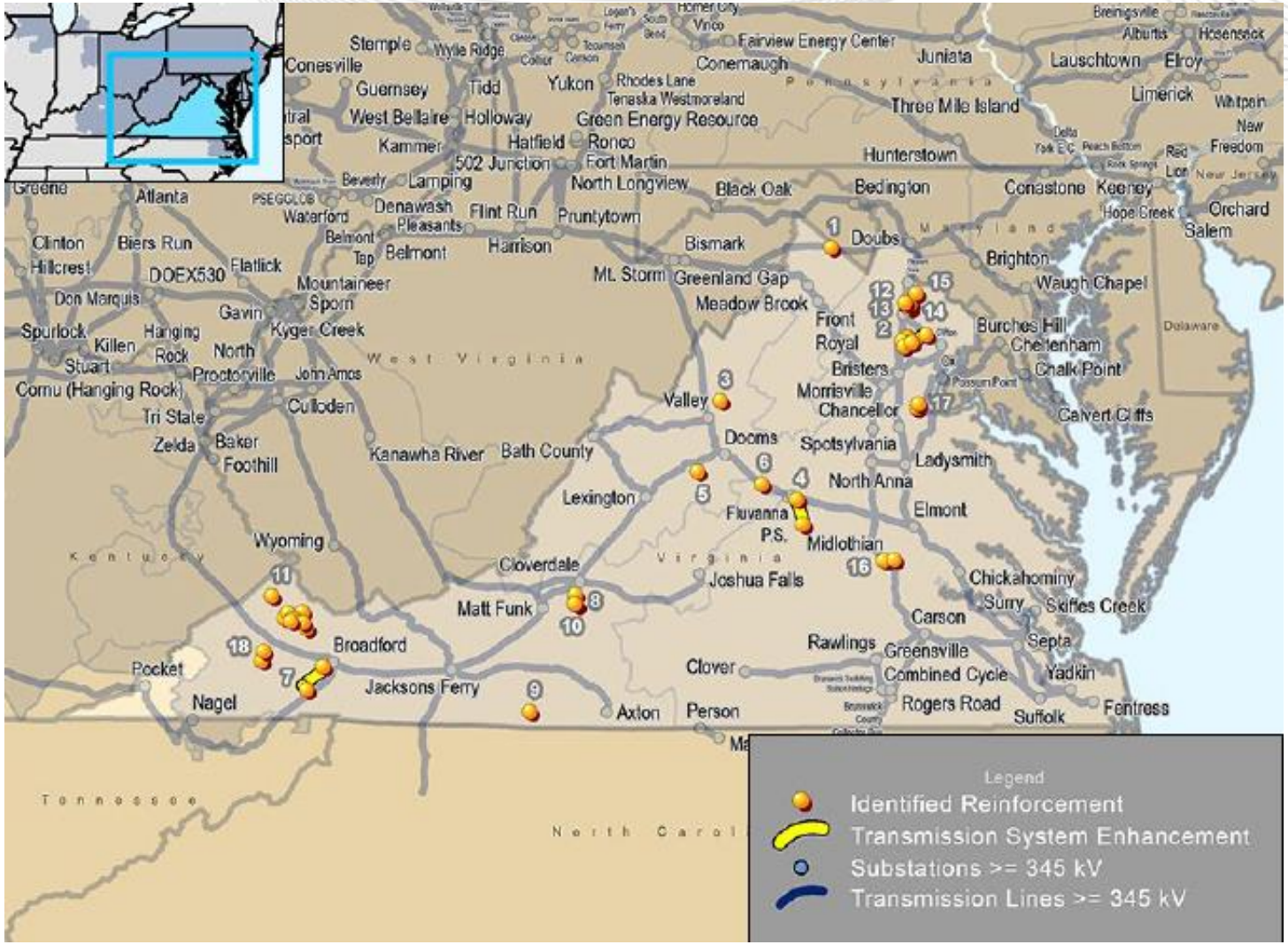
Virginia – RTEP Baseline Projects



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

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Virginia – RTEP Baseline Projects

Map ID	Project	Description	Required In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
1	b3242	Reconfigure Stonewall 138 kV substation from its current configuration to a six-breaker breaker-and-a-half layout and add two 36 MVAR capacitors with capacitor switchers.	6/1/2025	$13.30	APS	11/20/2020
2	b3246.1	Convert 115 kV line No. 172 Liberty-Lomar and 115 kV line No. 197 Cannon Branch-Lomar to 230 kV to provide a new 230 kV source between Cannon Branch and Liberty. The majority of 115 kV line No. 172 Liberty-Lomar and line No. 197 Cannon Branch-Lomar is adequate for 230 kV operation. Lines to have a summer rating of 1047 MVA/1047 MVA (SN/SE).	6/1/2023	$38.50	Dominion	12/1/2020
	b3246.2	Perform substation work for the 115 kV to 230 kV line conversion at Liberty, Wellington, Godwin, Pioneer, Sandlot and Cannon Branch.				
	b3246.3	Extend 230 kV line No. 2011 Cannon Branch-Clifton to Winters Branch by removing the existing line No. 2011 termination at Cannon Branch and extending the line to Brickyard creating 230 kV line No. 2011 Brickyard-Clifton. Extend a new 230 kV line between Brickyard and Winters Branch with a summer rating of 1572MVA/1572MVA (SN/SE).				
	b3246.4	Perform substation work at Cannon Branch, Brickyard and Winters Branch for the 230 kV line No. 2011 extension.				
	b3246.5	Replace the Gainesville 230 kV, 40 kA breaker “216192” with a 50 kA breaker.				

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Virginia – RTEP Baseline Projects

Map ID	Project	Description	Required In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
3	b3262	Install a second 115 kV, 33.67 MVAR cap bank at Harrisonburg substation along with a 115 kV breaker.	12/1/2025	$1.25	Dominion	11/4/2020
4	b3263	Cut existing 115 kV line No. 5 between Bremo and Cunningham substations and loop in and out of Fork Union substation.	12/1/2025	$2.50		
5	b3264	Install 115 kV breaker at Stuarts Draft station and sectionalize 115 kV line No. 117 into two 115 kV lines.	6/1/2025	$5.00		
6	b3268	Build a switching station at the junction of 115 kV line No. 39 and 115 kV line No. 91 with a 115 kV capacitor bank. The switching station will built with 230 kV structures but will operate at 115 kV.	12/1/2025	$12.00		12/1/2020
7	b3278.1	Saltville Station – Replace H.S. MOAB switches on the high side of the 138/69/34.5 kV T1 with a H.S. circuit switcher.	12/1/2025	$4.22	AEP	2/17/2021
	b3278.2	Meadowview station – Replace existing 138/69/34.5 kV transformer T2 with a new 130 MVA 138/69/13 kV transformer.				
	b3278.3	Saltville station – Install two 138 kV breakers and bus diff protection.				7/16/2021
8	b3289.1	Roanoke Station – Install high-side circuit switcher on 138/69/12 kV T5.	6/1/2025	$2.52		1/15/2021
	b3289.2	Huntington Court station: Install high-side circuit switcher on 138/69/34.5 kV T1.				
9	b3292	Replace existing 69 kV capacitor bank at Stuart station with a 17.2 MVAR capacitor bank.	12/1/2025	$0.00		
10	b3294	Replace existing 69 kV disconnect switches for circuit breaker "C" at Walnut Avenue station.	6/1/2025	$0.00		
11	b3295	Grundy 34.5 kV – Install a 34.5 kV, 9.6 MVAR cap bank.		$0.80		2/17/2021

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Virginia – RTEP Baseline Projects

Map ID	Project	Description	Required In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
12	b3300	Reconductor 230 kV line No. 2172 from Brambleton to Evergreen Mills along with upgrading the line leads at Brambleton to achieve a summer emergency rating of 1574 MVA.	6/1/2025	$2.32	Dominion	12/1/2020
13	b3301	Reconductor 230 kV line No. 2210 from Brambleton to Evergreen Mills along with upgrading the line leads at Brambleton to achieve a summer emergency rating of 1574 MVA.		$2.26		
14	b3302	Reconductor 230 kV line No. 2213 from Cabin Run to Yardley Ridge along with upgrading the line leads at Yardley to achieve a summer emergency rating of 1574 MVA.		$1.75		
15	b3303.1	Extend a new single-circuit 230 kV line (No. 9250) from Farmwell substation to Nimbus substation.		$5.70		
	b3303.2	Remove Beaumeade 230 kV line No. 2152 line switch.				
16	b3304	Perform Midlothian Area 300 MW load drop relief area improvements.		$6.22		
	b3304.1	Cut 230 kV line No. 2066 at Trabue junction.				
	b3304.2	Reconductor idle 230 kV line No. 242 (radial from Midlothian to Trabue junction) to allow a minimum summer rating of 1047 MVA, and connect to the section of 230 kV line No. 2066 between Trabue junction and Winterpock; renumber 230 kV line No. 242 structures to No. 2066.				
	b3304.3	Use the section of idle 115 kV line No. 153, between Midlothian and Trabue junction, to connect to the section of (former) 230 kV line No. 2066 between Trabue junction and Trabue to create new Midlothian-Trabue lines with new line numbers No. 2218 and No. 2219.				
	b3304.4	Create new line terminations at Midlothian for the new Midlothian-Trabue lines.				

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Virginia – RTEP Baseline Projects

Map ID	Project	Description	Required In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
17	b3321	Rebuild Cranes Corner-Stafford 230 kV line.	6/1/2022	$19.60	Dominion	8/10/2021
18	b3333.1	Rebuild Skeggs Branch substation in the clear as Coronado substation. Establish New 138 kV and 69 kV buses. Install 138/69 kV, 130 MVA transformer, 138 kV circuit switcher and 69 kV breaker. Retire Existing Skeggs Branch substation.	6/1/2023	$40.17	AEP	8/10/2021
	b3333.2	Install new ~1.2 mile 138 kV extension to new Skeggs Branch substation location.				
	b3333.3	Install 46.1 MVAR cap bank at Whitewood substation along with a 138 kV breaker.				
	b3333.4	Rebuild ~9 mile 69 kV line from new Skeggs branch station to Coal Creek 69 kV line. Six-wire the short double-circuit section between Whetstone Branch and Str. 340-28 to convert the line to single circuit. Retire Garden Creek to Whetstone Branch 69 kV line section.				
	b3333.5	Retire Knox Creek substation.				
	b3333.6	Retire Horn Mountain substation. This will be served directly from 69 kV bus at New Skeggs branch substation.				
	b3333.7	At Clell substation – Replace two 600A phase-over-phase switches and poles with single two-way 1200A phase-over-phase switch and pole.				
	b3333.8	At Permac – Replace 600A switch and structure with two-way 1200A phase-over-phase pole switch and pole.				
	b3333.9	At Marvin substation – Replace 600A switch and structure with two-way 1200A phase-over-phase pole switch and pole.				
	b3333.10	At Whetstone Branch substation – Replace 69 kV, 600A two-way phase-over-phase switch with 69 kV, 1200A two-way phase-over-phase switch. Remove 69 kV to Skeggs Branch (switch "22" phase-over-phase).				
	b3333.11	At Garden Creek substation – Remove 69 kV Richlands (via Coal Creek) line (circuit breaker F and disconnect switches) and update relay settings.				
	b3333.12	Perform remote end work at Clinch River substation.				
	b3333.13	Perform remote end work at Clinchfield substation.				

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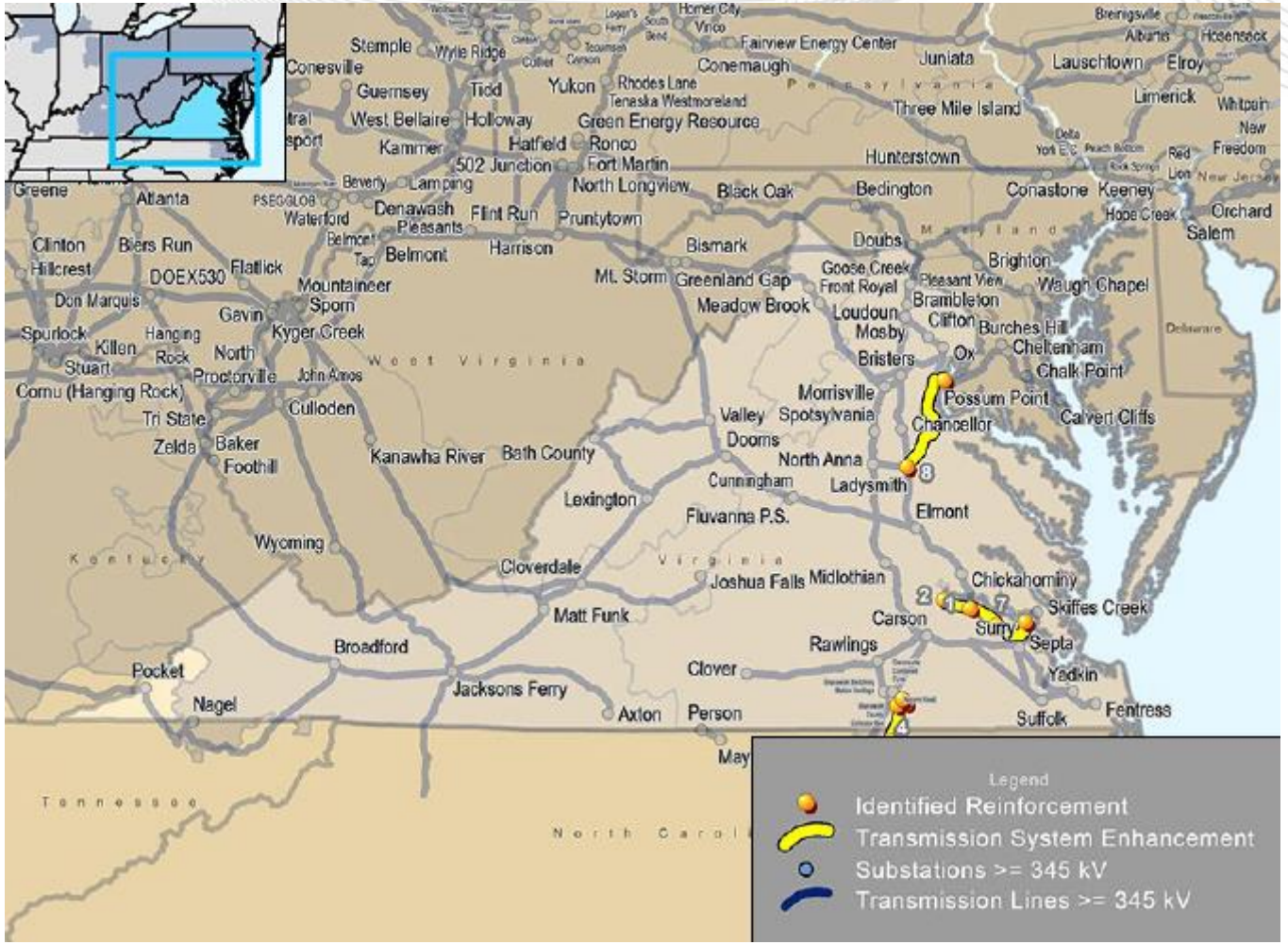
Virginia – RTEP Network Projects



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.

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Virginia – RTEP Network Projects

Map ID	Project	Description	Generation	Required In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
1	n5202	Build a three-breaker ring bus at Wards Creek substation.	AB2-190	2/1/2019	$5.99	Dominion	11/30/2021
2	n5204	Upgrade relay to accommodate new generation and interconnection substation at Hopewell-Surry line No. 240.			$0.06		
3	n5475	Modify transfer trip equipment at Carolina, Clubhouse and Emporia substations.	AB1-173	3/31/2018	$0.15		
4	n5803	Build a new three-breaker ring bus at the new AB2-100 substation.	AB2-100	12/1/2021	$6.03		
5	n5804	Install new backbone tower on Clubhouse-Lakeview line No. 254.			$1.29		
6	n5805	Upgrade protection for Clubhouse-Lakeview line No. 254 to accommodate AB2-100 generator and switching station.			$0.19		
7	n5826	Install a forth breaker in ring bus at Colonial Trail.	AC1-216	12/31/2020	$2.50		
8	n6063	Replace wave trap at both Ladysmith and Possum Point substations for the Ladysmith-Possum Point 500 kV line No. 568. This will increase line rating by 12% to 2913 MVA. Estimated to take 14–16 months to engineer and construct.	AC1-158	10/1/2019	$0.50		

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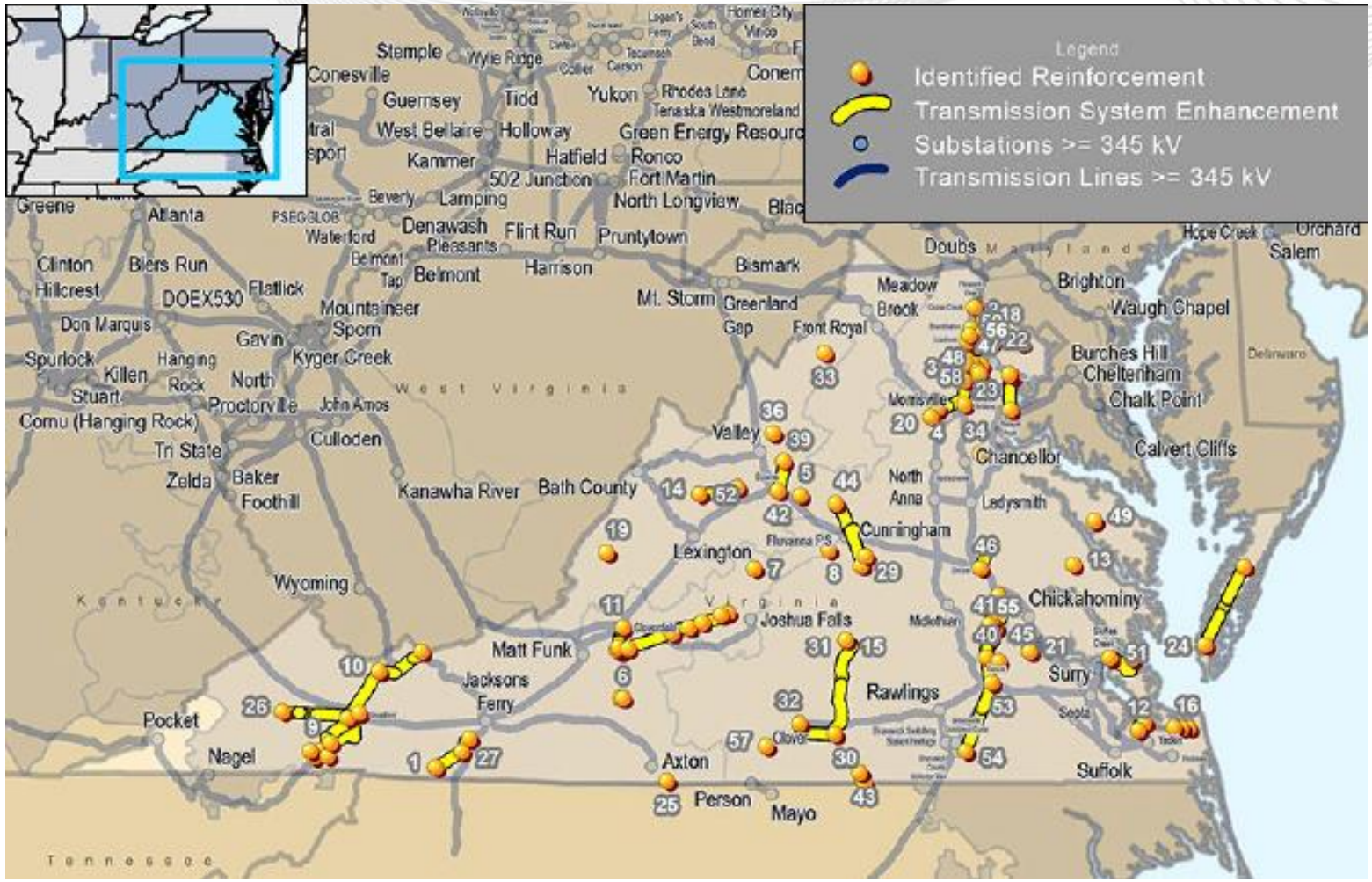
Virginia – TO Supplemental Projects



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.

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
1	s1851.1	Relocate Independence station to a new property and rebuilt as Point Lookout station. Point Lookout station will consist of a 69 kV bus, a 11.5 MVAR cap bank, two 69 kV circuit breakers. The station will also include a 69/34.5 kV 30 MVA transformer with two 34.5 kV distribution circuit breakers and a 69/12 kV 20 MVA transformer with one 12 kV distribution circuit breaker. The new cap bank at Point Lookout station is replacing the existing cap bank at Fries station due to the space limitations at Fries station associated with remote end work. The cap bank at Fries station cannot be retired due to a voltage violation scenario and the new cap bank will maintain the voltages above our criteria thresholds. Estimated Transmission Cost – $0 (station is considered Distribution).	6/1/2024	$0.00	AEP	5/17/2021
2	s2324.2	Build a new substation (Takeoff) by cutting line No. 2008 (Lincoln Park-Loudoun) and line No. 265 (Bull Run-Sully). Terminate all lines in a 230 kV breaker-and-a-half arrangement at Takeoff substation.	12/31/2025	$116.90	Dominion	2/9/2021
	s2324.3	Extend a new 230 kV double-circuit line ~3 miles from Aviator to Takeoff.				
	s2324.4	Reconductor 230 kV line segment between Loudoun and Takeoff using a standard high-				
	s2324.5	Reconductor 230 kV line segment between Lincoln Park and Takeoff using a standard high-capacity conductor (~2.63 miles).				
	s2324.6	Reconductor 230 kV line segment between Sully and Takeoff using a standard high-capacity conductor (~1.16 miles).				
	s2324.7	Replace one 230 kV breaker at Brambleton (SC102).				
	s2324.8	Replace three 69 kV breakers at Davis substation (178T186, 18622, T342).				
3	s2328.9	Cut 230 kV line 2015 (Dulles-Reston) and extend a new double circuit 230 kV line 3.5 miles to Global Plaza substation creating 230 kV line 2015 (Dulles to Global Plaza) and 230 kV line 9225 (Dulles to Reston).		$73.30		

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
4	s2340	Interconnect the new Rollins Ford substation by cutting and extending 230 kV line No. 2114 (Gainesville-Remington CT). Terminate both ends into a four-breaker ring arrangement to create a Rollins Ford-Gainesville line and a Rollins Ford-Remington CT line.	12/31/2021	$47.00	Dominion	9/1/2020
	s2340.1	Reconductor 230 kV line No. 2114 from Remington CT to Rollins Ford (~23.17 miles).	12/31/2025			6/8/2021
	s2340.2	Reconductor 230 kV line No. 2222 from Rollins Ford to Gainseville (~1.11 miles).				
5	s2341	Replace switches 23339 and 23336 of line No. 233 at Crozet substation. The replacement switches will be 3000amp to align with Dominion's 230 kV system standard. The section of line No. 233 from Dooms to Crozet will have a summer rating of 925 MVA after the switches have been replaced. Replace two backbone structures, modify existing tower structures along with some conductor work.	10/27/2020	$1.50		9/1/2020
6	s2429	Replacement of all the structures that make up the Grassy Hill Loop and Tank Hill tap 138 kV line asset from the Grassy Hill switch to the Tank Hill tap, consisting of ~0.95 miles of single circuit 138 kV wood poles.	10/31/2021	$1.97	AEP	11/20/2020
7	s2438	Clifford station – Replace the existing 138/69-46 kV, 50 MVA transformer No. 1 and 138/46 kV, 20 MVA transformer No. 3 with two 138/46 kV, 30 MVA transformers.		$5.90		12/18/2020
8	s2439	At Scottsville station, replace the existing 138/46 kV, 20 MVA transformer No. 1 & No. 2 (connected in parallel) and 138/46 kV, 20 MVA transformer No. 5 with two 138/46 kV, 30 MVA transformers; replace 46/12 kV, 5 MVA transformer No. 3 with 46/12 kV, 20 MVA transformer ; replace 46 kV circuit breaker E; add 12 kV circuit breaker & feeder.		$7.00		

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
9	s2444.1	At Meadowview station, replace 69 kV circuit breakers F&G with new 69 kV 3000A 40 kA breakers.	7/1/2024	$98.66	AEP	12/18/2020
	s2444.2	At South Abingdon, install a new 90 MVA 138/ 69 kV transformer bank.				
	s2444.3	Construct a new 69 kV line from South Abingdon to Arright of wayhead (~6.6 miles) (SN:129 MVA, SE – 180 MVA, WN – 162 MVA, WE – 202 MVA).				
	s2444.4	At Arright of wayhead station, install three 69 kV 3000A 40 kA breakers toward Damascus, Hillman Highway, and South Abingdon.				
	s2444.5	Retire the 69 kV section of line from Abingdon to Hillman Highway (~5 miles).				
	s2444.6	Rebuild ~23 miles of the Hillman Highway-Saltville 69 kV line (SN:129 MVA, SE – 180 MVA, WN – 162 MVA, WE – 202 MVA).				
	s2444.7	Retire ~23 miles of the Hillman Highway-Saltville 69 kV line.				
	s2444.8	Perform Hillman Highway remote end work.				
	s2444.9	At Abingdon station, retire 138/69-12kV transformer bank No. 1 and associated equipment.				
10	s2445.1	Hockman station – Construct a greenfield station consisting of one 138 kV line breaker and one MOAB switch in an in-and-out configuration.	11/1/2022	$4.90		1/15/2021
	s2445.2	Perform line work to loop the existing Bluefield-Tazewell 138 kV line in and out of the proposed Hockman 138 KV station.				
	s2445.3	Perform remote end work (including fiber install) at Tazewell and Bluefield Avenue stations.				

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
11	s2469.1	Rebuild ~43 miles of double circuit 138 kV line between Reusens and Roanoke substations.	10/31/2028	$177.60	AEP	3/19/2021
	s2469.2	Acquire additional Reusens-Roanoke 138 kV right of way as needed for the rebuild				
	s2469.3	Reconductor ~0.1 mile span into Ivy Hill station.				
	s2469.4	Tie into the existing Roanoke-Cloverdale 138 kV line via a new ~0.3 mile extension				
	s2469.5	Install new wire as underbuild on the Reusens-Roanoke 138 kV line, and reroute the existing Campbell Avenue-Roanoke 34.5 kV line due to Roanoke substation reconfiguration.				
	s2469.6	Reroute the existing Roanoke-Walnut 69 kV line due to Roanoke substation reconfiguration. Three replacement structures are expected to shift the alignment and follow the western part of the substation fence to terminate into the new box bay at Reusens substation.				
	s2469.7	At Roanoke station, replace 138 kV capacitor bank switcher “BB” with a 3000A 40 kA circuit breaker. Replace 138 kV capacitor bank switcher “CC” with a 3000A 40 kA circuit breaker. Replace 138 kV capacitor bank “CC” with a new 57.6 MVAR capacitor bank. Install high-side circuit switchers on transformers No. 2 (138/34.5 kV) and No. 5 (138/69 kV). Replace transformer No. 5 (138/69/12 kV) with a 130 MVA, 138/69/12 kV transformer. Replace 69 kV circuit breakers “U” and “V” with 2000 A, 40 kA circuit breakers. Replace pilot wire relaying with fiber relaying associated with 69 kV CBs “U” and “V”, and 34.5 kV CB “L”.				
	s2469.8	At Centerville station, reconfigure existing 138 kV with two new 138 kV circuit breakers on each line exit toward Cloverdale and Reusens substations rated at 3000A 40 kA to eliminate the three terminal line. Replace MOAB ground switch with circuit switcher on high-side of the transformer No. 1 (138/69/34.5 kV). Replace 69 kV circuit breaker “B,” associated disconnect switches and foundations with 3000A 40 kA circuit breaker.				
	s2469.9	At Campbell Avenue station, replace pilot wire relaying with fiber relaying associated with 34.5 kV CB-B and 69 kV CB-C.				
	s2469.10	At Walnut Avenue station, replace pilot wire relaying with fiber relaying associated with 69 kV CB-C.				
	s2469.11	Install fiber extensions and telecom to support SCADA connectivity along the line and at Vinton, Ivy Hill, Coffee and Moseley stations.				

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
12	**s2495**	Rebuild ~5.21 miles of 115 kV line No. 87 between Churchland and Hodges Ferry to current 115 kV standards. The summer rating of the line segment will be 262 MVA.	12/31/2023	$8.00	Dominion	10/15/2020
13	**s2496**	Interconnect the new King and Queen substation by tapping 230 kV line No. 224 to create a tee-tap arrangement with line switches on either side of the tap. Install a 1200 amp, 20 kAIC circuit switcher and any additional transmission related equipment (e.g., 230 kV bus, etc.) deemed necessary to support the interconnection.	6/1/2023	$1.86		11/4/2020
14	**s2497**	Replace ~17.8 miles of existing single-circuit wood H-frame structures on 230 kV line No. 293 and 3.5 miles of double-circuit painted/weathering steel structures shared between 230 kV line No. 293 and 115 kV line No. 83 with single and double-circuit steel monopoles, as appropriate. New conductor with a normal summer rating of 1047 MVA will be used for the entire line No. 293. The 3.5-mile segment of line No. 83 that is being replaced will use new conductor with a normal summer rating of 261 MVA.	12/15/2025	$44.80		
15	**s2498**	Install a 1200 amp, 50 kAIC circuit switcher and associated equipment (bus, switches, relaying, etc.) to feed the thirdrd distribution transformer at Farmwell.	1/1/2023	$0.50		
16	**s2499**	Rebuild 3.37 miles of 230 kV line No. 2007 between Lynnhaven and Thalia to current 230 kV standards. The normal summer rating of the line will be 1047 MVA.	12/31/2025	$7.00		
17	**s2500**	Rebuild ~1.17 miles of 230 kV line No. 2019 between Thalia and Structure 2019/21 to current 230 kV standards. The normal summer rating of the line segment will be 1047 MVA.		$3.00		

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
18	s2503	Install a 1200 amp, 50 kAIC circuit switcher and associated equipment (bus, switches, relaying, etc.) to feed the fourth distribution transformer at Cumulus.	12/1/2022	$0.50	Dominion	12/1/2020
19	s2504	Rebuild ~14.94 miles of 138 kV line No. 14, between Fudge Hollow to the demarcation point of AEP, to current 138 kV standards and with a minimum rating of 211 MVA.	12/31/2024	$30.00		12/16/2020
20	s2505	ODEC has submitted a DP Request (on behalf of REC) to add a new, 56 MVA distribution transformer at Brandy DP in Culpeper County. Install three 35 kV CTs and three 35kV PTs at lower side of the transformers and associated equipment (the metering cabinet, the meter, the cellular modem, etc.).	12/15/2020	$0.04		1/14/2021
21	s2506	Convert existing Garysville DP, in Prince George County, from a distribution sourced delivery to a transmission sourced delivery. Create a tee-tap on 230 kV line No. 240 (Hopewell-Surry) at tower 196 by installing doublecircuit H-frame switch structures on both sides at mid-span and remove tower 196. Replace towers 195 and 197 (suspension towers) with double dead-end steel pole structures to accommodate phase roll. Install terminal structure and H-frame switch structure for the tap span.	12/1/2022	$3.00		2/9/2021
22	s2507	Install a 1200 amp, 50 kAIC circuit switcher and associated equipment (bus, switches, relaying, etc.) to feed the third transformer at Shellhorn.	4/15/2022	$6.50		
	s2507.1	Reconductor the segments of 230 kV line 2008 between Cub Run and Walney (1.07 miles).	12/31/2025			6/8/2021
	s2507.2	Reconductor the segments of 230 kV line 2008 between Walney to Takeoff (1.94 miles).				

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
23	s2544	At Gore – Install 138 kV breaker on the Stonewall terminal. Remove existing Stonewall 138 kV line switch. At Stonewall – Adjust relaying.	5/1/2021	$0.00	APS	4/16/2021
24	s2552	ODEC area – Install OPGW on the 110 miles of transmission lines with underground fiber in the various areas where the transmission lines are underground such as airport runways or water crossings.	12/31/2028	$0.00	DPL	5/20/2021
25	s2569.1	Berry Hill 138 kV station – Establish a new 138 kV, three-breaker ring bus (space for a six-breaker ring). Install 138/34.5 kV, 30 MVA distribution transformer.	4/15/2022	$14.66	AEP	6/15/2021
	s2569.2	Berry Hill 138 kV extension – 0.2 mile relocation of Axton-Danville No. 2 138 kV and installation of a new 138 kV tap structure. Construct ~5.04 miles of double circuit 138 kV line from tap location to new Berry Hill substation.				
26	s2572.1	Rebuild and reconfigure the Saltville 138 KV station in a three string breaker-and-a-half bus arrangement to allow replacement of 138 KV CBs A, B, C, V, L, and U with new 3000A 40 kA circuit breakers. Replace existing 69 KV circuit breaker J with a new 3000A 40 kA circuit breaker. Replace existing transformer No. 1 with a new 138/69-34.5 KV 50 MVA transformer. Replace existing high side MOAB switches with high side circuit switchers on T2&T5.	7/1/2025	$75.61		7/16/2021
	s2572.2	Line work and right of way required to relocate the Broadford-Saltville No. 1 138 kV, Broadford-Saltville No. 2 138 kV, Clinch River-Saltville 138 kV lines to terminate into Saltville station's new configuration. This work includes installing two structures (steel tower structures) and total of ~0.24 new wire and old wire replacement.				
	s2572.3	Rebuild ~21 miles of the 138 kV line between Saltville and Tazewell stations (SN/SE/WN/WE – 296/413/375/464 MVA).				
	s2572.4	Perform remote end work Costs Tazewell, Meadowview, Broadford and Clinch River stations.				

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
27	**s2574**	Once the Jubal Early to Point Lookout line is built, rebuild the existing ~11.4 mile 69 kV Fries-Point Lookout line on the current center line.	5/1/2025	$33.00	AEP	7/16/2021
28	**s2598**	Interconnect the new Altair substation by cutting and extending 230 kV line No. 201 (Belmont-Brambleton) to the proposed Altair substation. Lines to terminate in a 230 kV four breaker ring arrangement with an ultimate arrangement of a six-breaker ring.	9/1/2024	$15.00	Dominion	3/9/2021
29	**s2599**	Replace the existing twelve 69 kV breakers with new 69 kV, 3000 amp, 50 kA units. Include other ancillary equipment (arresters, switches, relays, etc.) as needed.	6/30/2022	$5.50		7/12/2021
30	**s2600**	Add a second 22.4 MVA distribution transformer at Chase City substation. Install a 1200 amp, 25 kAIC circuit switcher and associated equipment (switches, relaying, etc) to feed the new transformer.	2/17/2022	$0.50		3/18/2021
31	**s2601**	Split 230 kV line No. 235 Clover-Farmville near Chase City substation and extend two single circuit 230 kV lines for ~ 15 miles to the proposed Cloud substation. Terminate the two 230 kV lines into four-breaker ring bus to create a Cloud-Clover line and a Cloud-Farmville line. Add two 224 MVA 115/230 kV transformers with breakers on both sides. Expand 115 kV bus to four-breaker ring bus. Four additional 230 kV breakers will be paid for by customer (cost not included here).	6/1/2024	$45.00		4/6/2021

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
32	s2602.1	Cut and extend 230 kV line No. 2226 Clover-Cloud to the proposed Easters 230 kV substation. Add one 84 MVAR 230 kV cap bank for voltage support. Once conversion from 115 kV to 230 kV substation is complete, remove Easters 115 kV tap and reconnect line No. 137 Kerr Dam-Ridge Road. Eight additional 230 kV breakers will be paid for by customer (cost not included here). (Stage 1 of project interconnects the new 115 kV Easters substation by cutting and extending 115 kV line No. 137 (Kerr Dam-Ridge Road).	6/1/2024	$54.00	Dominion	4/6/2021
	s2602.2	Rebuild ~16 miles between 230 kV Clover Sub and structure No. 235/310 of 230 kV line No. 2226 using a higher capacity conductor and associated substation equipment to achieve an expected rating of 1572 MVA.	6/30/2026			11/30/2021
33	s2603	Replace Edinburg transformer No. 3 with a new three phase, 138/115/13.2 kV, 112 MVA unit. Include other ancillary equipment (arresters, switches, relays, etc.) as needed.	12/31/2022	$3.00		6/15/2021
34	s2604	Replace Fredericksburg transformer No. 7 with a new three phase, 230-115 kV, 224 MVA unit. Replace high side switches, H744M and H644M, with new circuit breakers to provide fault interruption capability. Upgrade high side bus relay panels to current standards. Include any other ancillary equipment (arresters, switches,relays, etc.) as needed.	11/30/2023	$4.00		6/8/2021
35	s2605	Add a second distribution transformer at Hamilton substation. Install a 1200 amp, 50 kAIC circuit switcher and associated equipment (switches, relaying, etc) to feed the new transformer.	12/1/2022	$0.75		5/11/2021
36	s2606	Replace Harrisonburg transformer No. 4 with a new three phase, 230/69/13.2 kV, 168 MVA unit. Include other ancillary equipment (arresters, switches, relays, etc.) as needed.	12/31/2022	$3.20		6/8/2021

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
37	s2607	Replace Harrisonburg transformer No. 6 with a new three phase, 230/69/13.2 kV, 168 MVA unit. Include other ancillary equipment (arresters, switches, relays, etc.) as needed.	12/31/2023	$3.20	Dominion	6/8/2021
38	s2608.1	Interconnect the new substation Hourglass by cutting and extending 230 kV line No. 2196 Pioneer-Sandlot. Terminate both ends into a 230 kV four-breaker ring arrangement with a provision to add two additional 230 kV breakers for an ultimate configuration of a six-breaker arrangement.	6/15/2023	$108.00		5/11/2021
	s2608.2	Reconductor 230 kV line No. 2187 segment Pioneer DP-Liberty using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1572 MVA.	12/15/2026			11/30/2021
	s2608.3	Reconductor 230 kV line No. 2228 segment Pioneer DP-Liberty using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1572 MVA.				
	s2608.4	Reconductor 230 kV line No. 2163 segment Vint Hill-Liberty using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1572 MVA.				
	s2608.5	Reconductor 230 kV line No. 2080 segment Liberty-Railroad DP using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1572 MVA.				
	s2608.6	Reconductor 230 kV line No. 2151 segment Railroad DP-Gainesville using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1572 MVA.				
	s2608.7	Install one 840 MVA 500-230 kV transformer at Bristers substation and associated 500 kV and 230 kV equipment. Expand Bristers substation to the north of the existing site to accommodate the 230 kV breaker ring required for the addition of the new transformer. Line terminations for 115 kV line No. 183 Bristers– Ox), 230 kV line No. 2101 Bristers–Vint Hill 230 kV, and 500kV line No. 539 Ox–Bristers) will be rearranged to accommodate the expansion.				

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
39	s2609.1	Interconnect the new substation Interconnection by cutting and extending 230 kV line 2152 Buttermilk-Beaumeade. Terminate both ends into a four-breaker ring arrangement to create an Interconnection-Beaumeade line and an Interconnection-Nimbus-Buttermilk line.	12/15/2024	$176.00	Dominion	4/6/2021
	s2609.2	Install one 1440 MVA 500-230 kV transformer at Goose Creek substation. Extend the existing 500kV ring bus at Goose Creek substation to be set up for a future six-breaker ring arrangement. One breaker to be installed initially creating a five-breaker ring bus. Install a new 230 kV ring bus at Goose Creek substation to be set up for a future four-breaker ring arrangement. Three 230 kV breakers to be installed initially. Cut and extend line No. 227 Belmont-Beaumeade into Goose Creek substation.				11/30/2021
	s2609.3	Reconductor 230 kV line No. 202 Clark–Idylwood, ~4 miles, using a higher capacity conductor and upgrade terminal equipment to achieve an expected rating of 1574 MVA.				
	s2609.4	Install one 1440 MVA 500-230 kV transformer and associated 230 kV breaker ring at Occoquan substation to supply the area with a 500 kV source. Install a 500 kV ring bus and associated 230 kV breaker-and-a-half bus configuration at Occoquan substation. Cut and loop 500 kV line No. 571 Ox–Possum Point as the 500 kV source into the proposed 500 kV ring bus. Existing terminations for 230 kV line No. 2001 Occoquan–Possum Point, line No. 2013 Occoquan–Ox, and line No. 2042 Odgen Martin–Ox will be rearranged to terminate into the rebuilt Occoquan station line No. 215 Hayfield–Possum Point will be rearranged to route over the expanded Occoquan station.				
	s2609.5	Rebuild 230 kV line No. 2013 Occoquan–Ox using a higher capacity conductor, as well as terminal equipment upgrades, to achieve an expecting rating of 1574 MVA.				
	s2609.6	Upgrade two 230 kV breakers 201342 and L142 from 50 kA to 63 kA at Ox substation due to an insufficient breaker duty rating with the expansion in place.				
	s2609.7	Install a new backbone and right of way of breaker-and-a-half equipment to the south of the existing 230 kV Ox yard. Cut and loop 230 kV line No. 237 Braddock-Possum Point into Ox substation				
	s2609.8	Rebuild ~10 miles segment of 230 kV line No. 205 from Locks to Tyler and upgrade the terminal equipment. The minimum summer normal rating of the line segment will be 1572 MVA.				
	s2609.9	Upgrade 230 kV Pleasant View breakers L3T203 and L3T2180 from 50 kA to 63 kA.				

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
40	**s2610**	Rebuild all wood H-frame structures on 115 kV line Locks-Chesterfield from Locks to Harright of waygate and reconductor the 5.4 miles with current 115 kV standards construction practices. Upgrade terminal equipment as needed. The normal summer rating of the line will be 393 MVA.	12/31/2022	$6.90	Dominion	6/15/2021
41	**s2611**	Rebuild all wood H-frame structures and reconductor the entire 14.0 miles of 115 kV line Chesterfield-Northeast with current 115 kV standards construction practices. Upgrade terminal equipment as needed. The normal summer rating of the line will be 262 MVA.	12/31/2022	$18.20		
42	**s2613**	Wreck and rebuild ~11.5 miles of 230 kV line No. 272 Dooms-Grottoes. Replace weathering CORTEN lattice-type towers with steel monopoles. New conductor to be used will have a normal summer rating of 1047 MVA to meet current 230 kV standards.	12/31/2026	$30.80		4/6/2021
43	**s2614**	Rebuild ~4.7 miles 115 kV line No. 45 between Kerr Dam to Duke Interconnection with current 115 kV standards construction practices. New conductor with a minimum normal summer rating of 262 MVA will be used.	12/31/2022	$11.00		8/13/2021
44	**s2615**	Build a new 230/115 kV switching station connecting to 230 kV network line No. 2028 (Fork Union to Charlottesville), and provide a 115 kV source from the new station to serve Cunningham DP. After Cunningham DP is moved to the new source, the 11-mile segment of 115 kV line No. 5 from Fork Union to Cunningham DP will be retired.	6/30/2023	$16.30		

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
45	**s2616**	Wreck and rebuild 115 kV line No. 53 and 115 kV line No. 72, ~3.7 miles from Chesterfield Power station to the Brown Boveri tap (structures 200A to 232) with a minimum summer normal rating of 393 MVA. Uprate the line terminals (wave trap, risers, line/breaker leads, switches, breakers, etc.) at Chesterfield Power station to support/match the increased line rating. The 0.52 mile tap line into Kingsland substation will use the lower rated standard conductor for 115 kV tap lines (175 MVA).	9/30/2022	$9.75	Dominion	3/18/2021
46	**s2617**	Rebuild the entire 9.0 miles of 115 kV line No. 73 Elmont-Four Rivers with current 115 kV standards construction practices. Upgrade terminal equipment as needed. The normal summer rating of the line will be 262 MVA.	12/31/2022	$11.70		6/15/2021
47	**s2619**	Add a fourth distribution transformer at NIVO substation. Expand the substation to include a four-breaker 230 kV ring bus arrangement to comply with the Company's Facility Interconnection Requirements (Section 7.2). Install a 1200 amp, 50 kAIC circuit switcher and associated equipment (relaying, etc. to feed the new transformer).	9/1/2022	$7.00		8/10/2021
48	**s2620**	Add a second distribution transformer at Nokesville substation. Install a 1200 amp, 50 kAIC circuit switcher and associated equipment (switches, relaying, etc.) to feed the new transformer.	11/1/2022	$0.75		5/11/2021
49	**s2621**	Replace Northern Neck transformer No. 4 with a three-phase, 230-115 kV, 168 MVA unit from Prince George substation. Include other ancillary equipment (arresters, switches, relays, etc.) as needed.	8/19/2021	$1.70		3/9/2021

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
50	s2622.1	Interconnect the new substation Park Center by cutting and extending 230 kV line No. 2043 Reston-Lincoln Park. Terminate both ends into a four-breaker ring arrangement to create a Park Center-Reston line and a Park Center-Lincoln Park line.	8/1/2024	$15.00	Dominion	5/11/2021
	s2622.2	Reconductor ~3 miles of line No. 2008 from Dulles to Lincoln Park upgrade the terminal equipment. The minimum summer rating of the line segment will be 1572 MVA.	12/15/2026			11/30/2021
51	s2623	Rebuild ~6.2 miles double circuit segment of 230 kV line No. 209 Skiffes Creek-Yorktown and 115 kV line No. 58 Skiffes Creek-Yorktown between Skiffes Creek and C&O Junction to current standards. The normal summer rating of this segment of line No. 209 and line No. 58 will be 1047MVA and 262MVA, respectively. Rebuild ~4.5 miles single circuit segment of 115 kV line No. 58 to current 115 kV standards. The normal summer rating of the line segment will be 262 MVA.	12/31/2025	$19.50		6/8/2021
52	s2624	Wreck and rebuild ~14.6 miles of 115 kV line No. 83 Craigsville-Staunton. Replace lattice steel towers with appropriate structures. New conductor to be used will have a normal summer rating of 262 MVA.	12/31/2023	$23.00		7/12/2021
53	s2625	Replace six existing towers supporting 230 kV line No. 2002 Carson-Poe with new galvanized steel towers of the same structural design on the existing foundations. Preliminary investigations have found that the existing foundation designs have sufficient structural capacity to support the new towers.		$4.25		4/6/2021
54	s2626	Replace five existing double circuit towers supporting 230 kV line No. 238 Carson-Clubhouse and 230 kV line No. 249 Carson-Locks with new galvanized steel towers of the same structural design on the existing foundations. Preliminary investigations have found that the existing foundation designs have sufficient structural capacity to support the new towers.		$3.50		

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Virginia – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
55	**s2627**	Upgrade the distribution transformer at Plaza substation. Install a 1200 amp, 20 kAIC circuit switcher and associated equipment (switches, relaying, etc.) to feed the new transformer.	2/28/2022	$0.50	Dominion	5/11/2021
56	**s2628**	Interconnect the new substation Racefield by cutting and extending 230 kV line 2094 Brambleton-Loudoun. Terminate both ends into a four-breaker ring arrangement to create a Racefield-Brambleton line and a Racefield-Loudoun line.	7/24/2023	$12.00		6/8/2021
57	**s2629**	Add a secondnd distribution transformer at Sinai substation. Install a 1200 amp, 25 kAIC circuit switcher and associated equipment (bus, switches, relaying, etc.) to feed the new transformer.	11/15/2022	$0.50		8/13/2021
58	**s2630.1**	Interconnect the new substation Wakeman by cutting and extending 230 kV line No. 2148 Cannon Branch-Cloverhill. Terminate lines in a four-breaker ring with the station being set up for an ultimate six-breaker ring arrangement.	12/1/2022	$10.60		8/10/2021
	s2630.2	Extend a new 230 kV line 0.25 miles between Winters Branch and Wakeman. Add a 230 kV breaker at Winters Branch and Wakeman substations to terminate the new 230 kV line.	6/15/2026			

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Planning
Load Forecast

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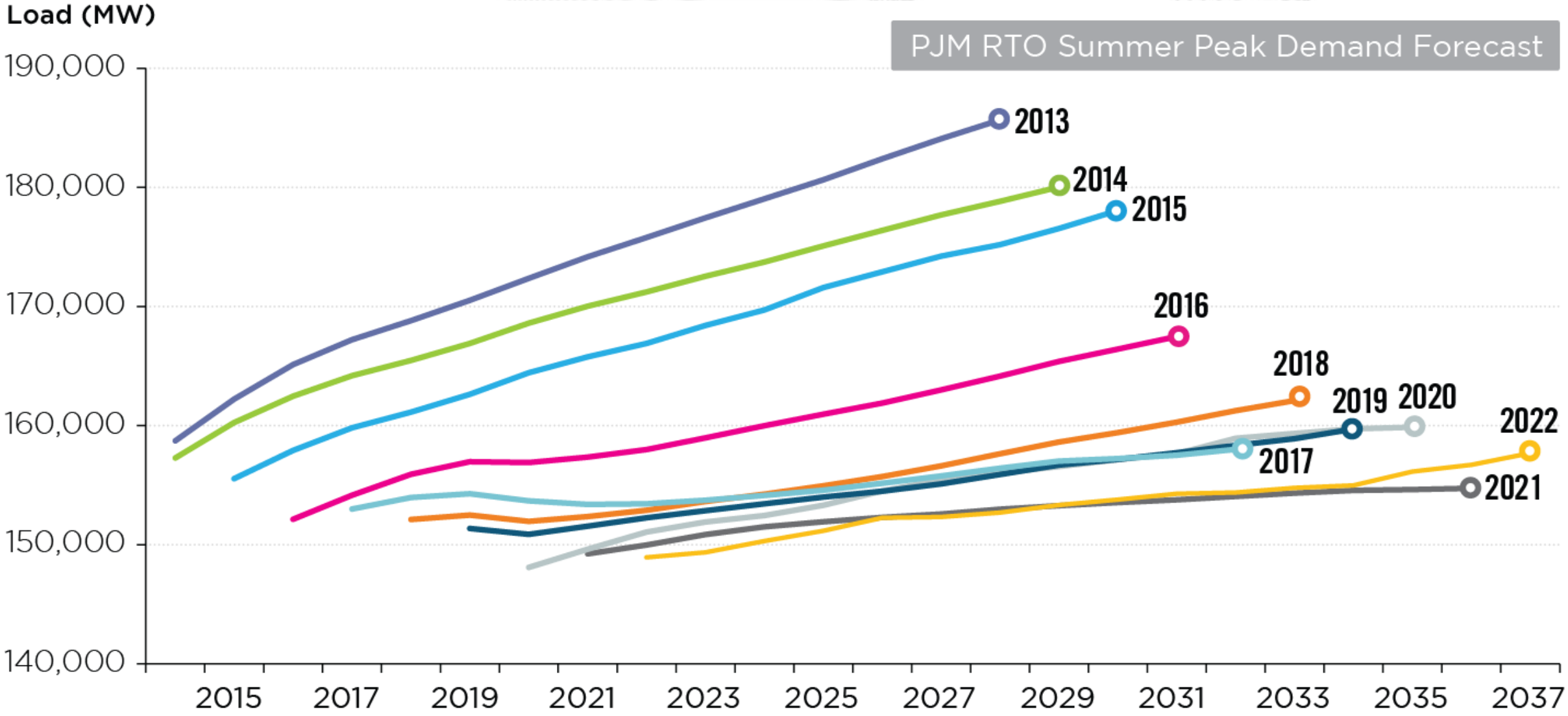
PJM Annual Load Forecasts

(Jan. 2022)



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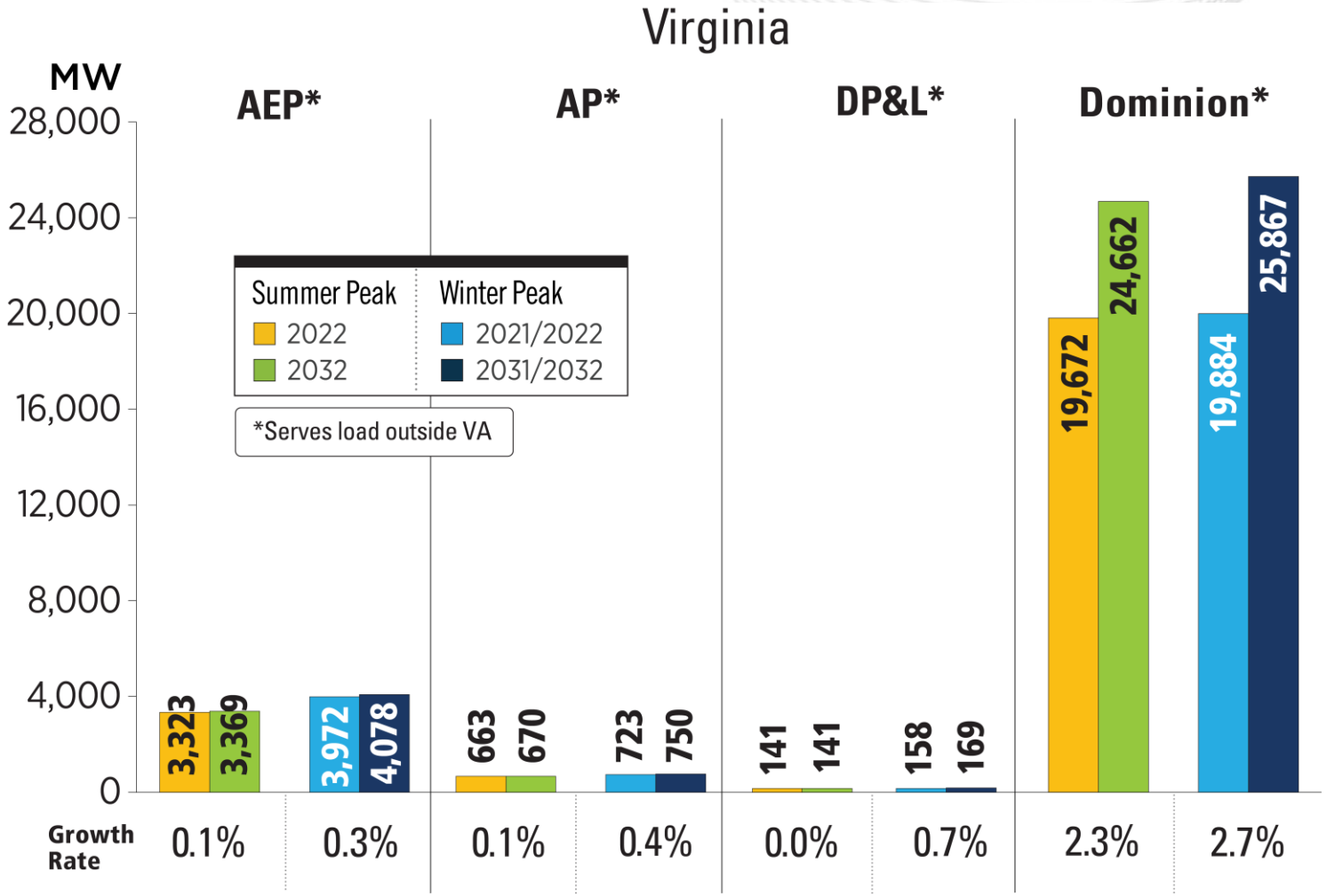
Virginia – 2022 Load Forecast Report



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%	

* 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.

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Markets

Capacity Market Results

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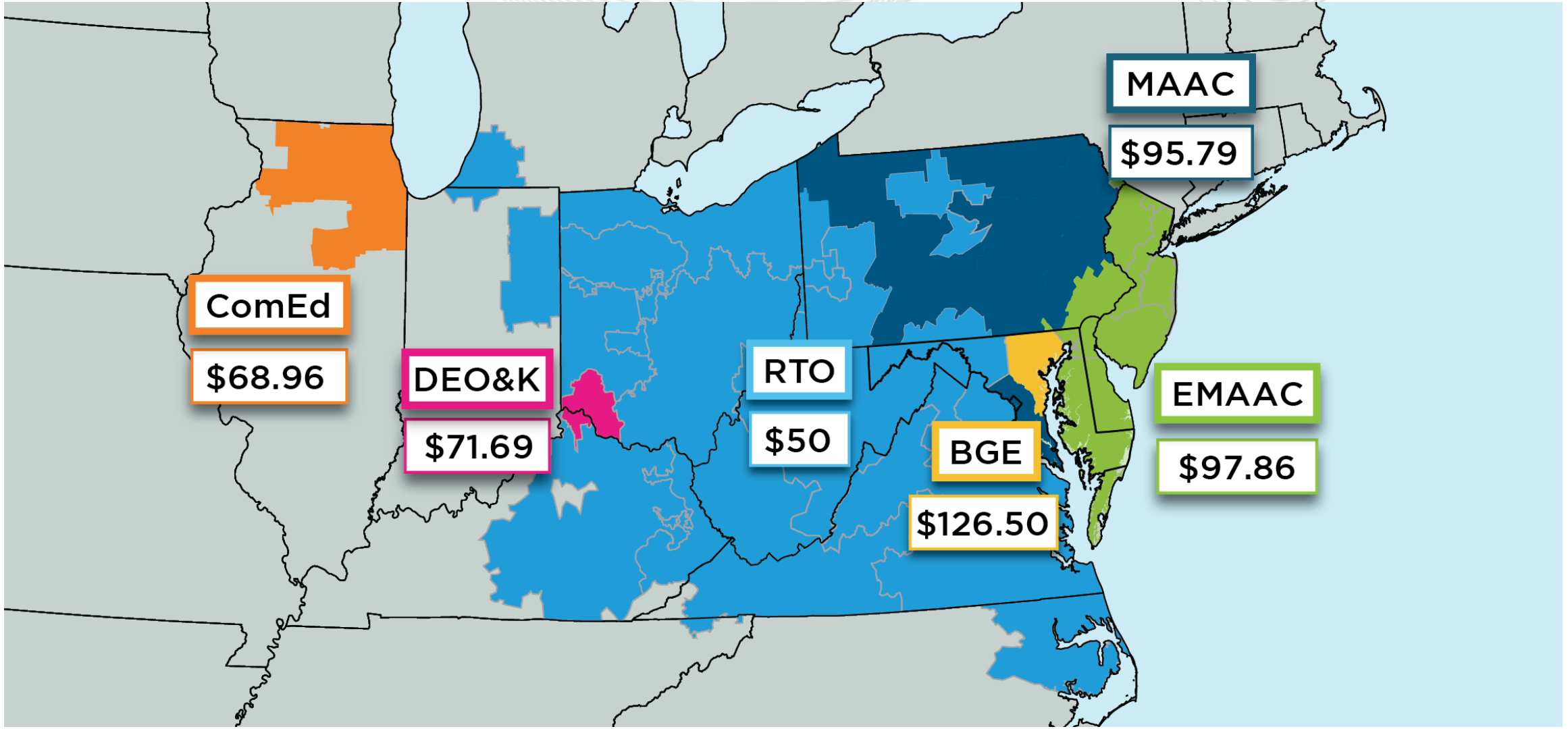
2022/2023 Base Residual Auction Clearing Prices ($/MW-Day)



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

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

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Virginia – Cleared Resources in 2022/23 Auction

(June 2, 2021)

	Cleared MW (Unforced Capacity)	Change from 2021/22 Auction
Generation	7,109	-16,618*
Demand Response	976	-431
Energy Efficiency	712	+147
Total	8,797	-16,902

RTO Locational Clearing Price
$50

**The Dominion locational delivery area participated in the Fixed Resource Requirement for the 2022/23 auction. This reduced the amount of generation located in Virginia available for the 2022/23 auction in comparison to previous capacity auctions.*

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.

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Virginia – Offered and Cleared Resources in 2022/23 Auction

(June 2, 2021)

		Unforced Capacity
Generation	Offered MW	7,877
	Cleared MW	7,109
Demand Response	Offered MW	1,256
	Cleared MW	976
Energy Efficiency	Offered MW	718
	Cleared MW	712
Total Offered MW		9,851
Total Cleared MW		8,797

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.

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Markets

Market Analysis

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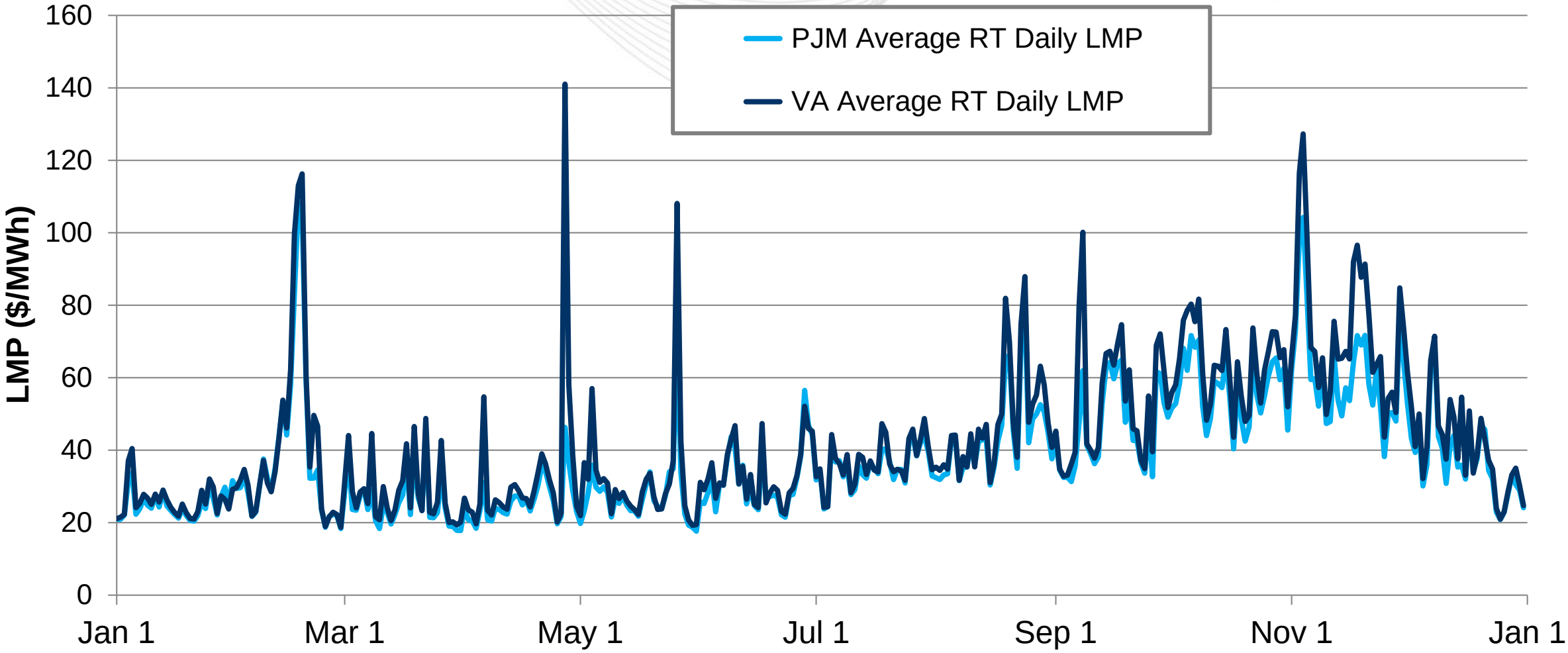
Virginia – Average Daily LMP

(Jan. 1, 2021 – Dec. 31, 2021)



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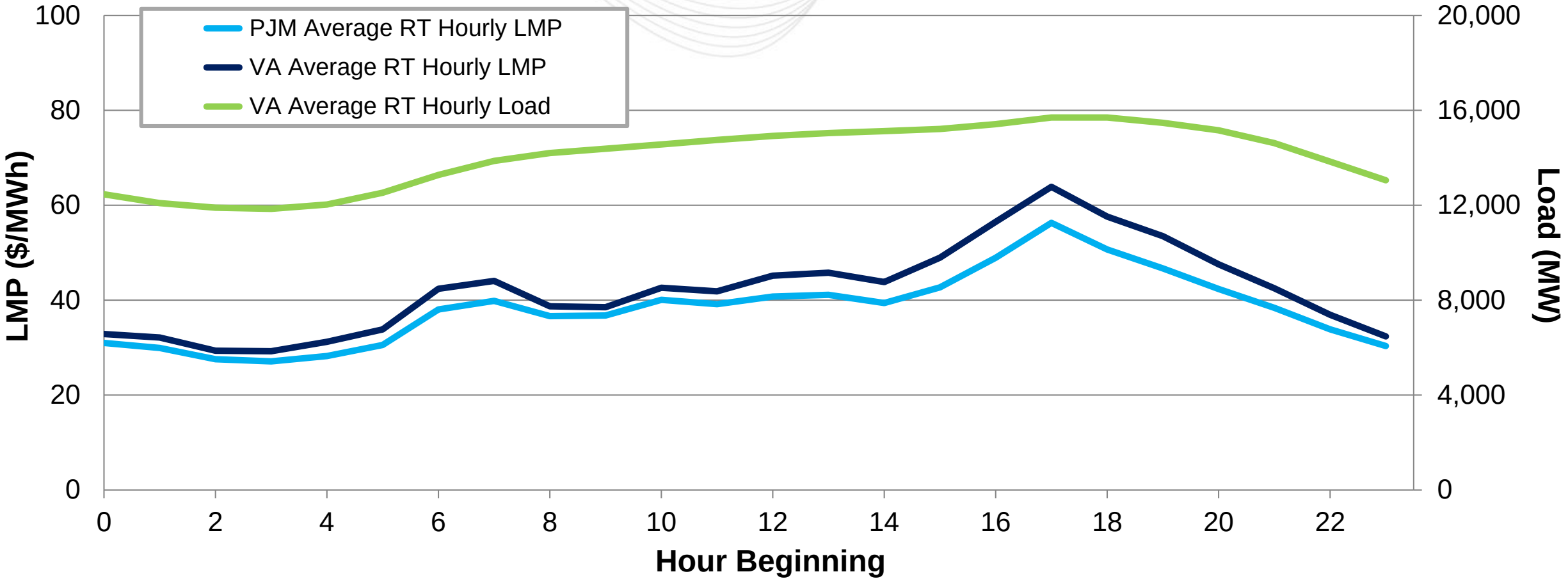
Virginia – Average Hourly LMP and Load

(Jan. 1, 2021 – Dec. 31, 2021)

Virginia's average hourly LMPs were above the PJM average hourly LMP.



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Virginia – Net Energy Import/Export Trend

(Jan. 2021 – Dec. 2021)

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

Note – A significant amount of generation from units owned by Virginia jurisdictional utilities and included in regulated rates charged to Virginia customers are physically located outside of Virginia. They are categorized as imports in the chart.

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Operations

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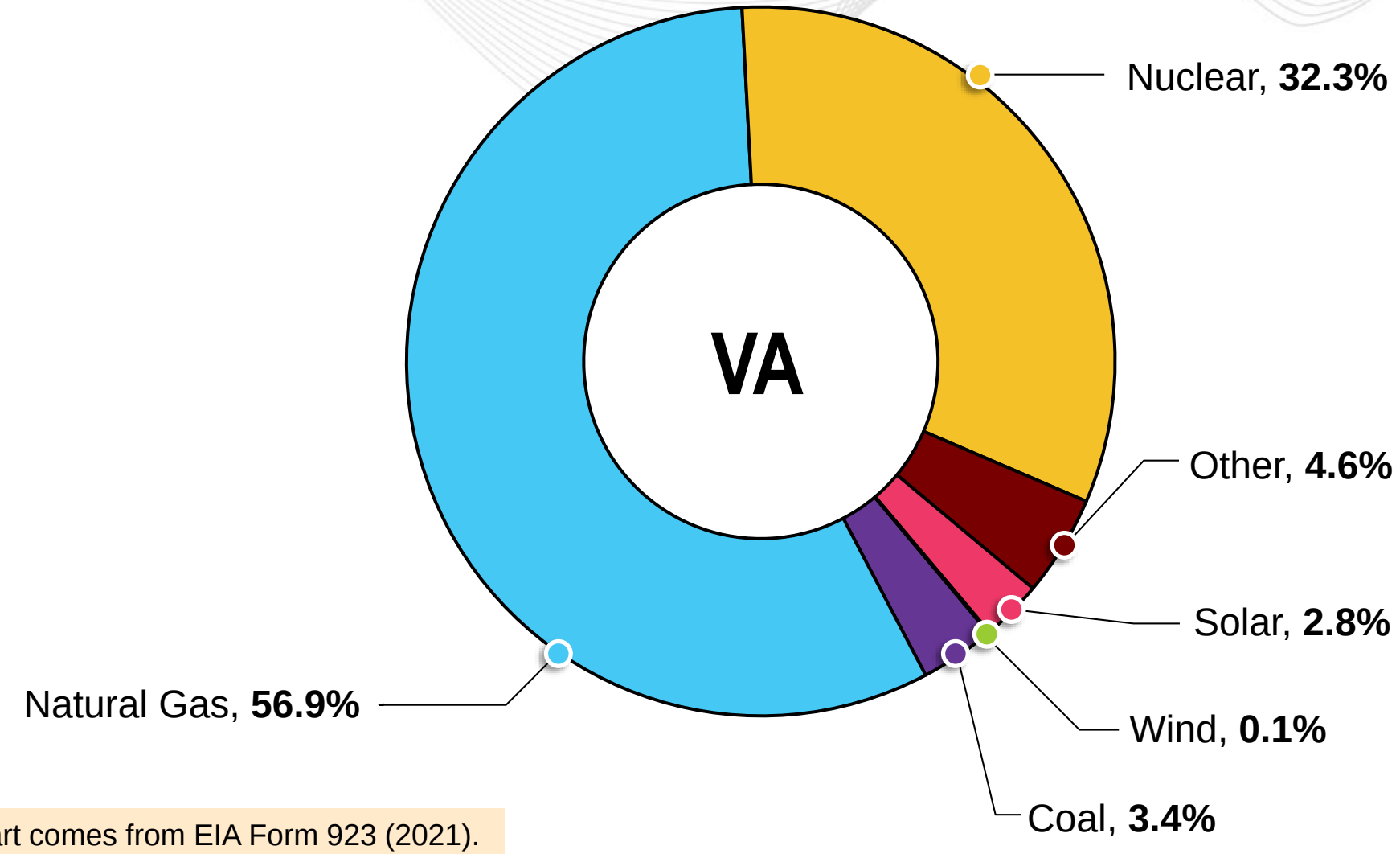
Virginia – 2021 Generator Production



The data in this chart comes from EIA Form 923 (2021).

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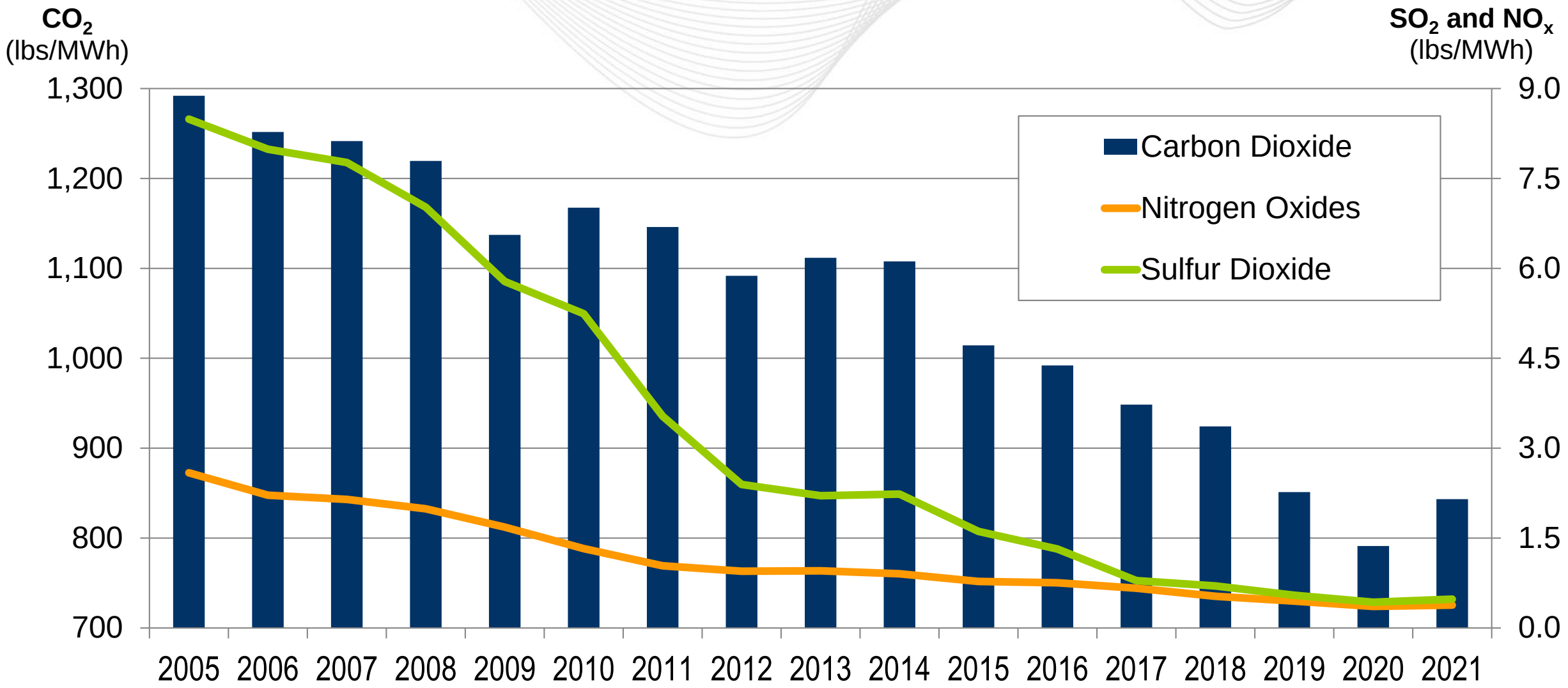
2005 – 2021 PJM Average Emissions



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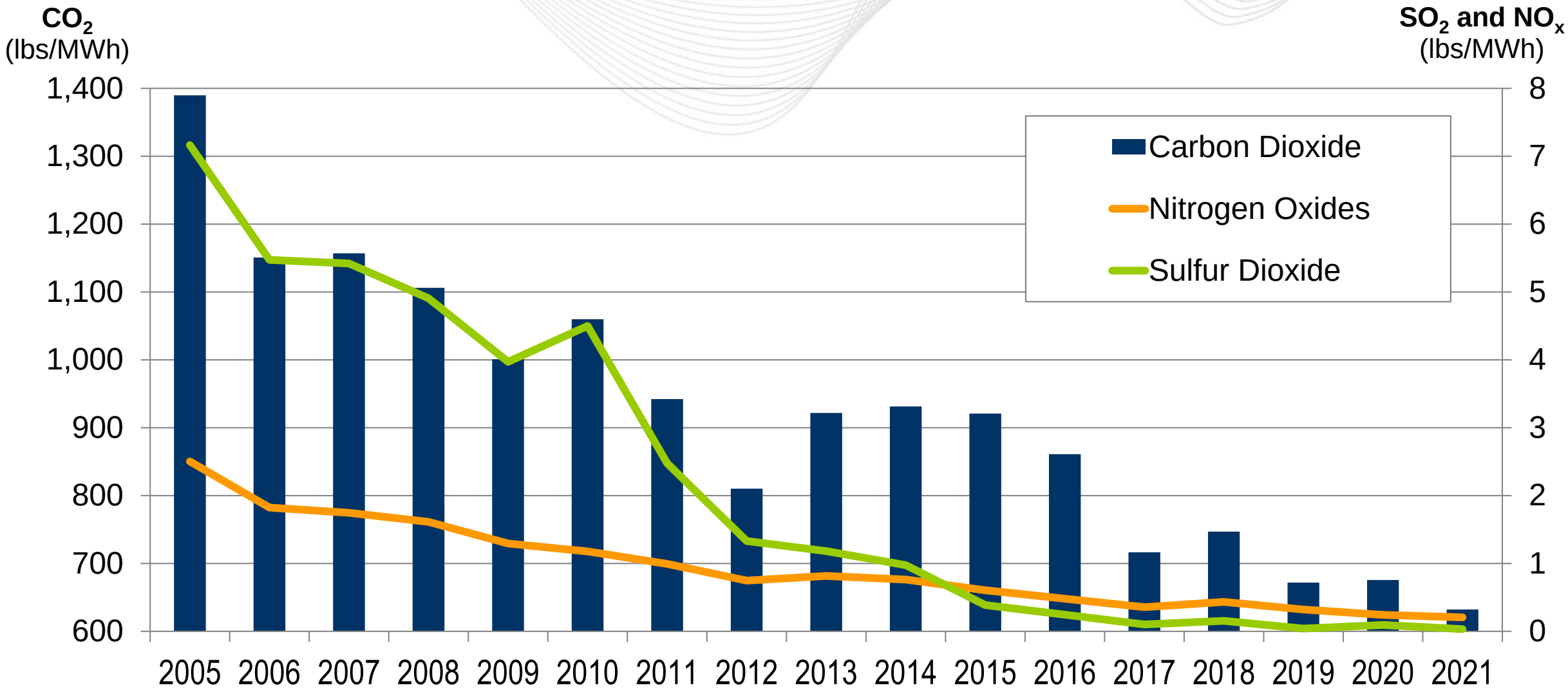
Virginia – Average Emissions (lbs/MWh)

(Feb. 2022)



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