2021 North Carolina State Infrastructure Report

(January 1, 2021 – December 31, 2021)

May 2022

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

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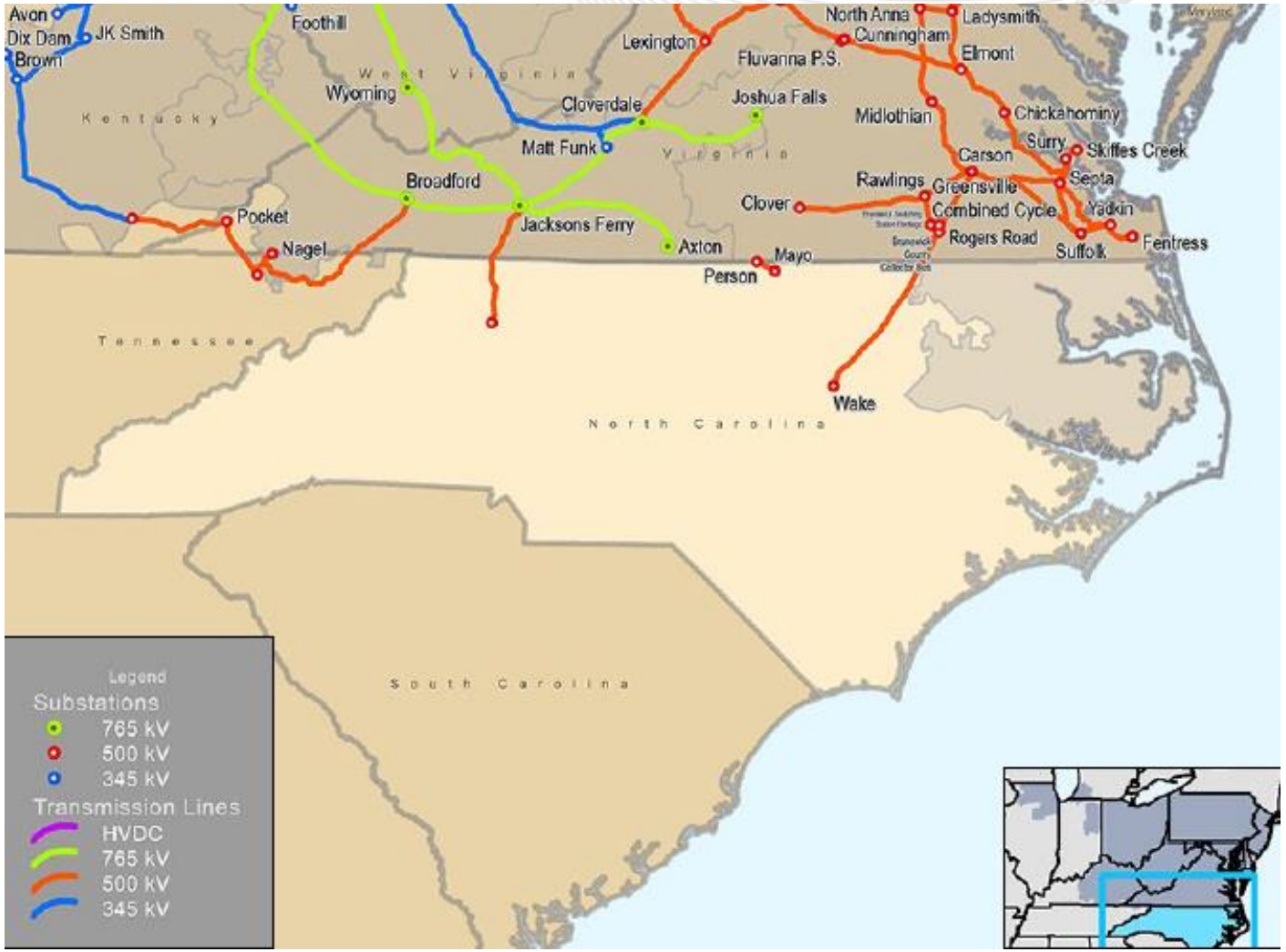
- **Existing Capacity:** Solar represents approximately 55.6 percent of the total installed capacity in the North Carolina service territory while hydro represents approximately 27.2 percent.
- **Interconnection Requests:** Solar represents 87.2 percent of new interconnection requests in North Carolina.
- **Deactivations:** No generation in North Carolina gave notification of deactivation in 2021.
- **RTEP 2021:** North Carolina's 2021 RTEP projects total approximately $51.1 million. This total is comprised entirely of supplemental projects in the Dominion zone.

- **Load Forecast:** North Carolina's peak load within the PJM footprint is projected to grow 0.7 percent annually over the next ten years. Comparatively, the overall PJM RTO projected load growth rate is 0.4 percent in the summer and 0.7 percent in the winter.
- **2022/23 Capacity Market:** The portion of North Carolina within the PJM footprint cleared at the RTO price of $50/MW-day in the 2022/2023 Base Residual Auction.
- **1/1/21 – 12/31/21 Market Performance:** North Carolina's average hourly LMPs were slightly above the PJM average hourly LMP, except during mid-day hours.

PJM Service Area – North Carolina



The PJM service area in North Carolina is the Dominion zone and is represented by the shaded portion of the map.

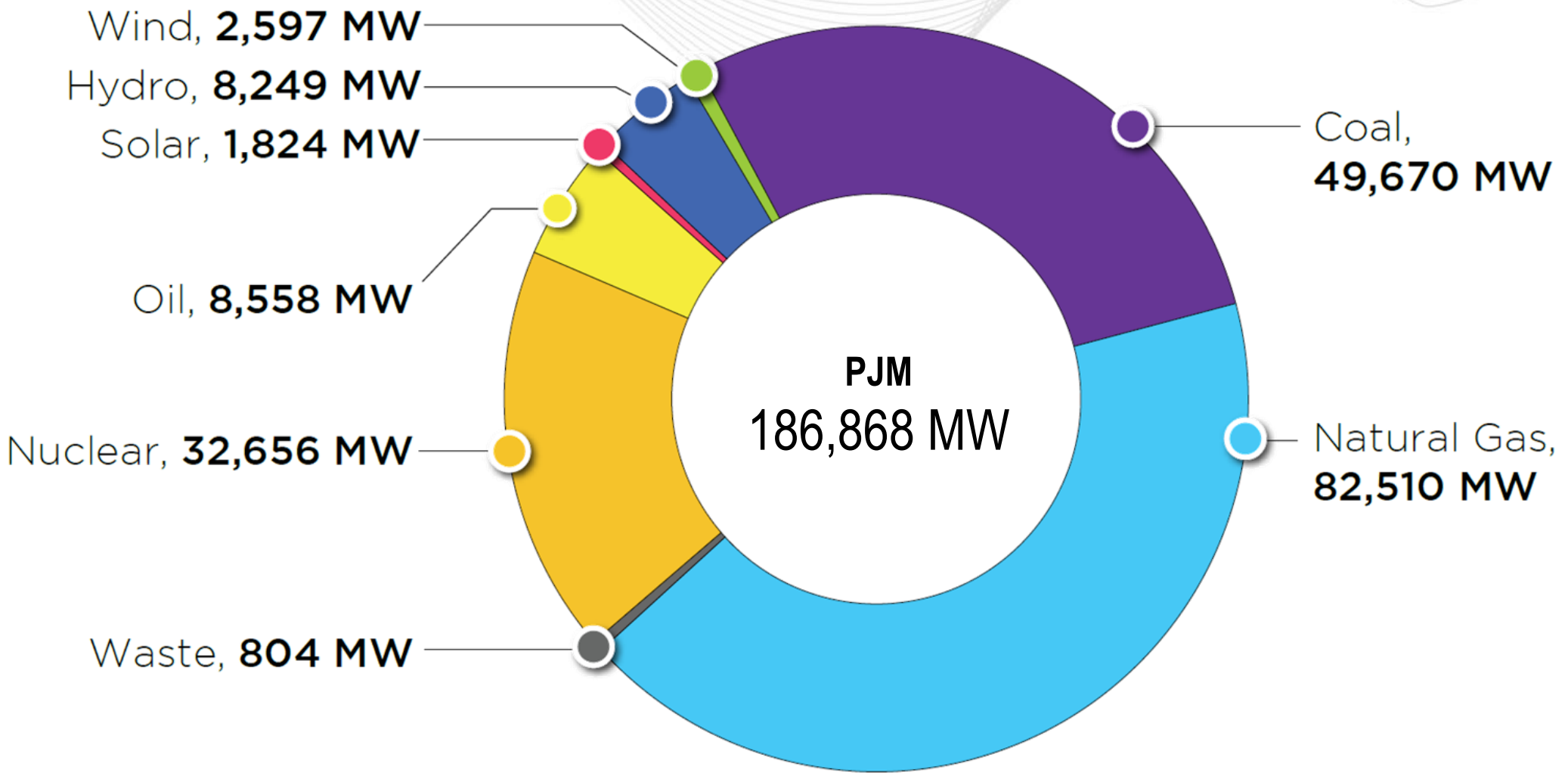
PJM operates transmission lines that extend beyond the service territory.

Planning

Generation Portfolio Analysis

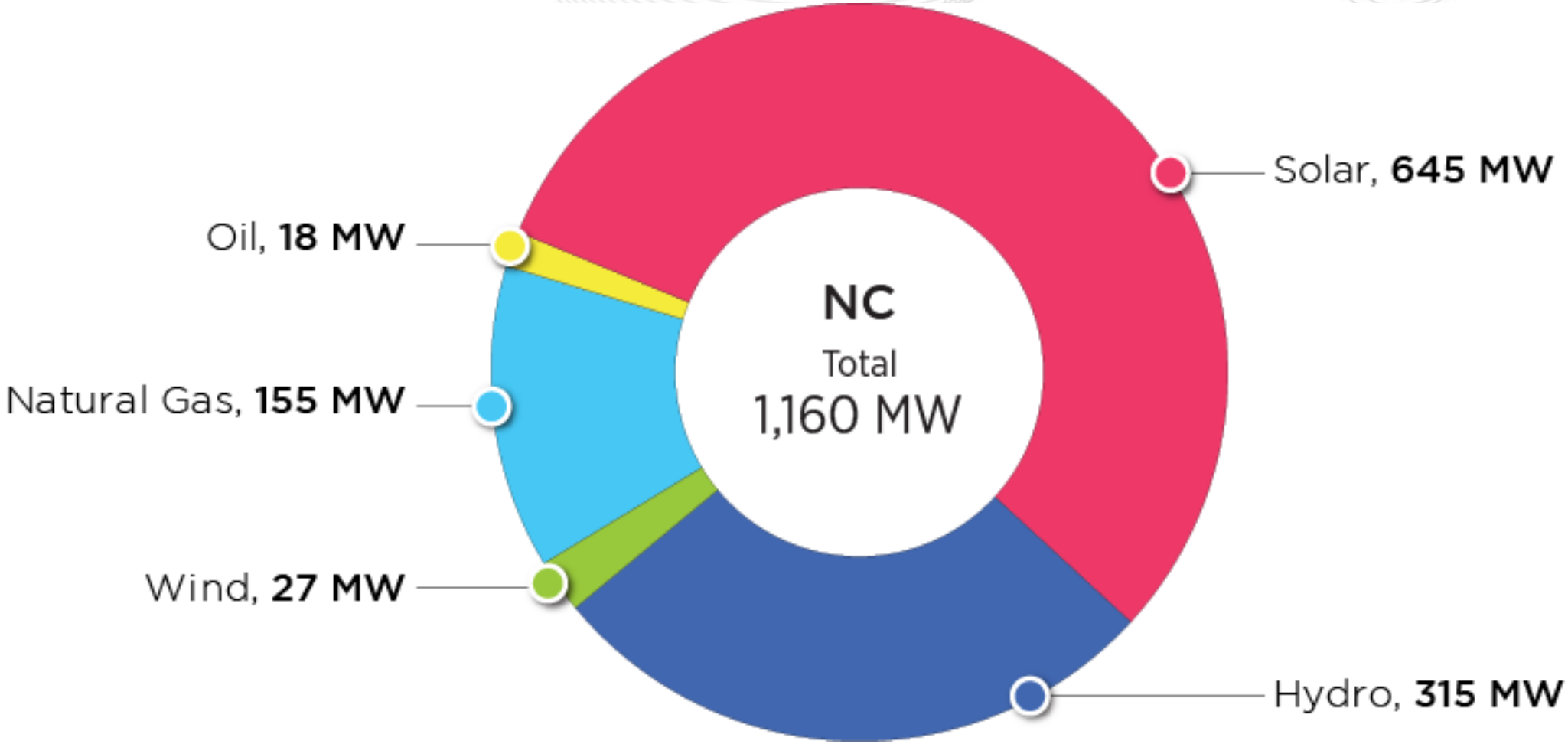
PJM – Existing Installed Capacity

(CIRs – as of Dec. 31, 2021)



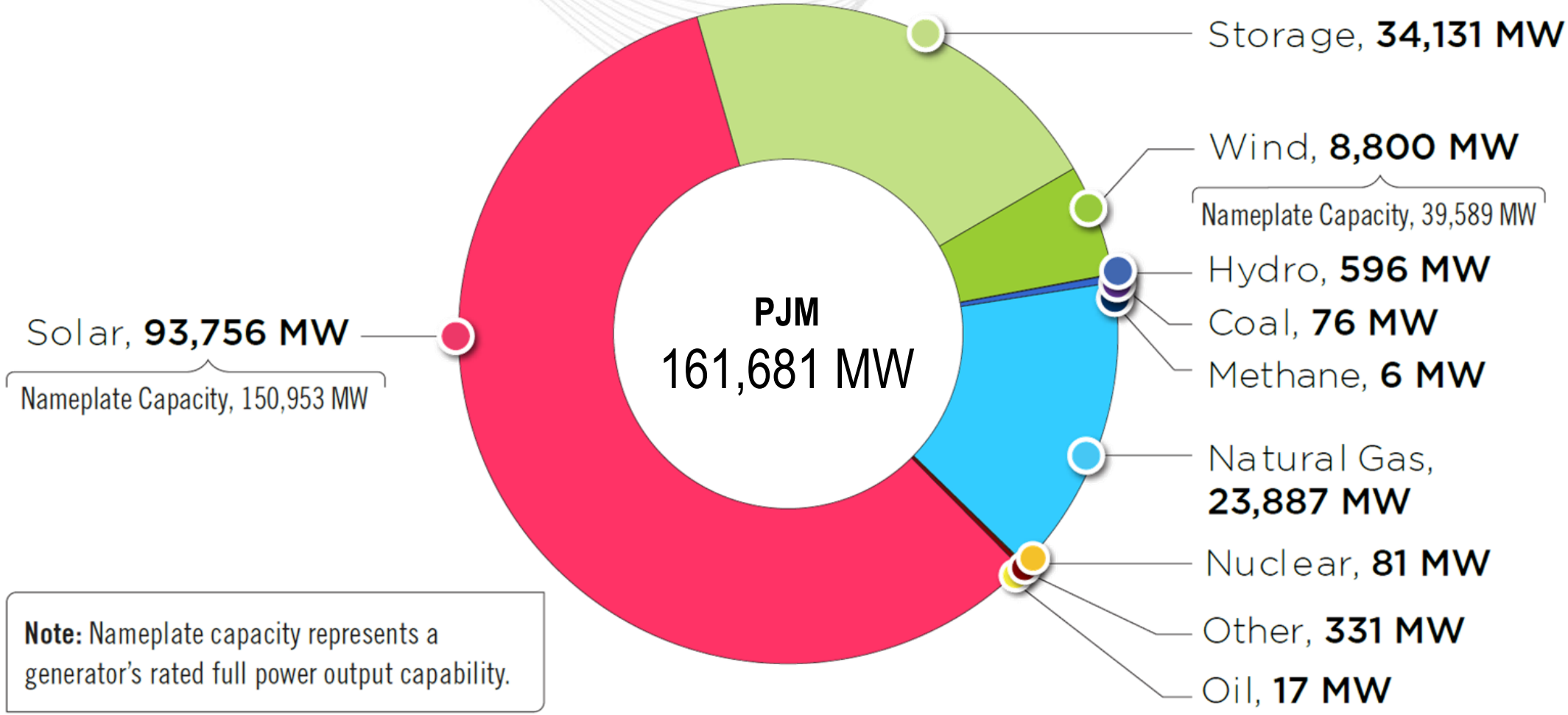
North Carolina – Existing Installed Capacity

(CIRs – as of Dec. 31, 2021)



PJM – Queued Capacity (MW) by Fuel Type

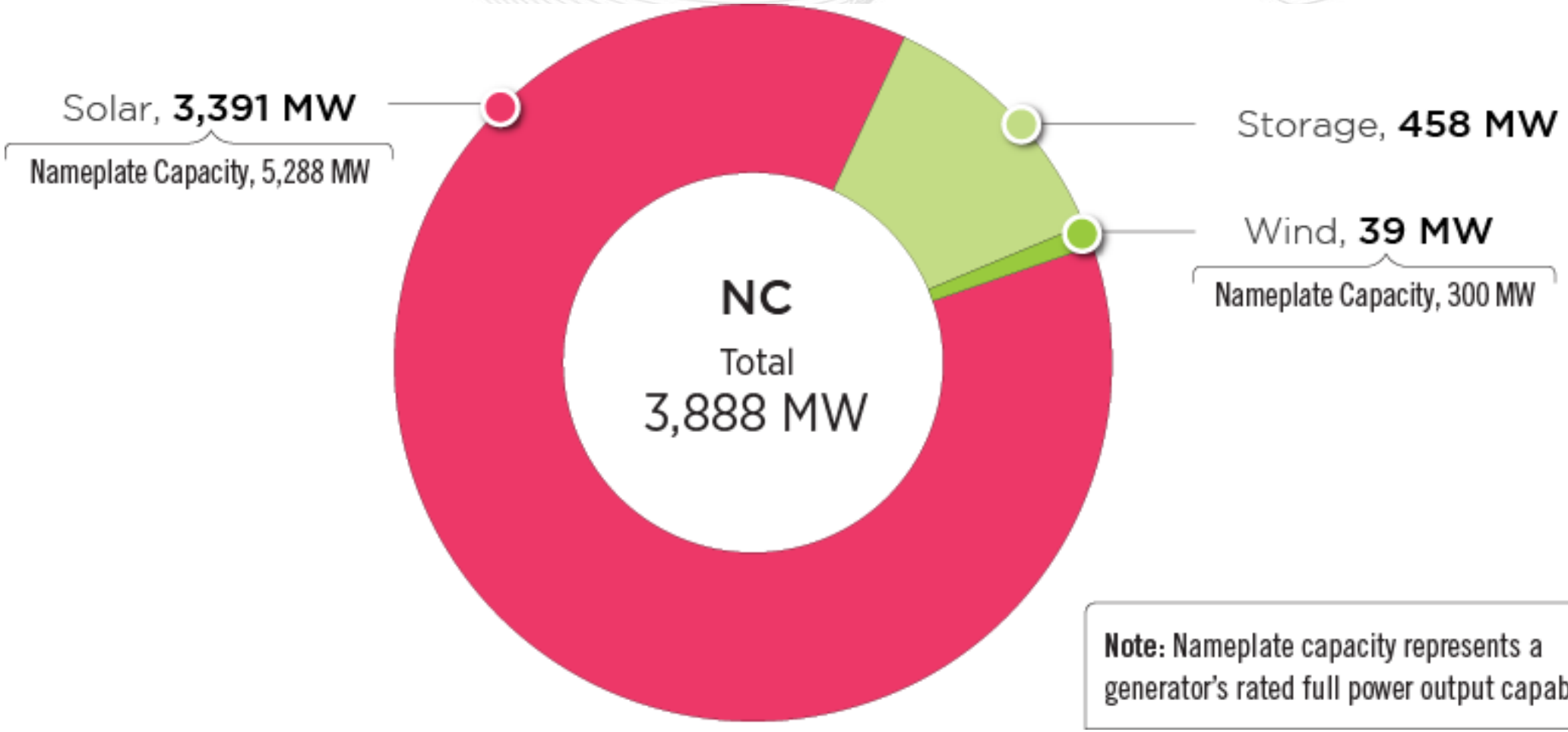
(Requested CIRs – as of Dec. 31, 2021)



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

North Carolina – 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.

North Carolina – 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	Storage	12	458.0	0	0.0	0	0.0	0	0.0	5	130.5	17	588.5
Renewable	Methane	0	0.0	0	0.0	0	0.0	0	0.0	1	12.0	1	12.0
	Solar	49	3,035.8	4	109.1	6	246.1	21	645.0	88	3,310.3	168	7,346.2
	Wind	0	0.0	1	39.0	0	0.0	1	27.0	9	195.3	11	261.3
	Wood	0	0.0	0	0.0	0	0.0	1	50.0	1	80.0	2	130.0
	Grand Total	**61**	**3,493.8**	**5**	**148.1**	**6**	**246.1**	**23**	**722.0**	**104**	**3,728.1**	**199**	**8,338.0**

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

North Carolina – Progression History of Interconnection Requests

Percentage of planned capacity and projects that have reached commercial operation

16.0%	Requested capacity megawatts
18.1%	Requested projects

			Capacity	Nameplate
Projects withdrawn after final agreement	7	Interconnection Service Agreements	234 MW	743 MW
	5	Wholesale Market Participation Agreements	44 MW	65 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.

North Carolina – Generation Deactivation Notifications Received in 2021

North Carolina had no generators give notice of deactivation in 2021.

Planning

Transmission Infrastructure Analysis

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

The complete list of all RTEP projects in PJM, including those from prior years, can be found at the "RTEP Upgrades & Status – Transmission Construction Status" page on pjm.com.

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

North Carolina – RTEP Baseline Projects

North Carolina had no baseline project upgrades in 2021.

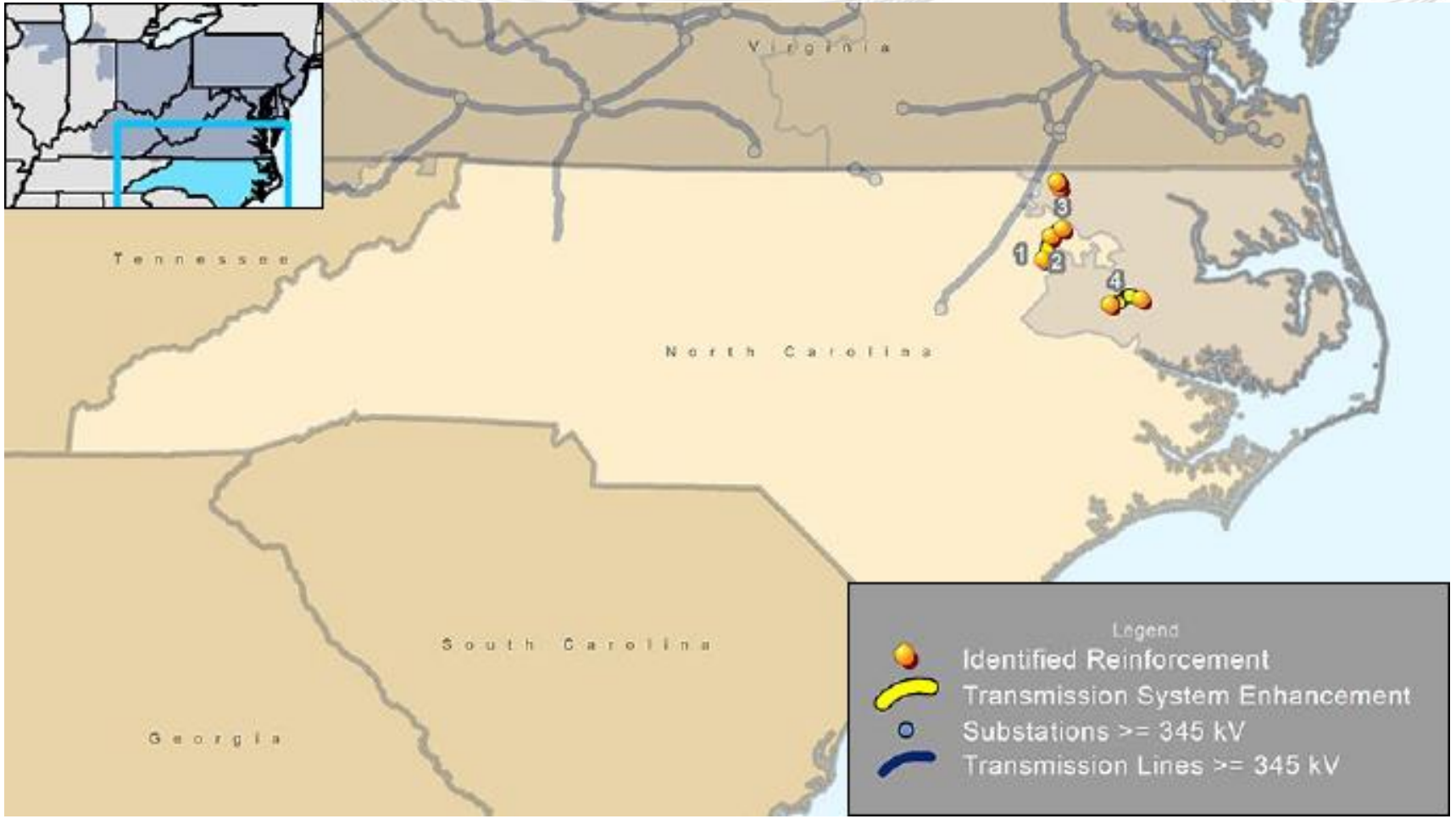
Note: Baseline upgrades are those that resolve a system reliability criteria violation.

North Carolina – RTEP Network Projects

North Carolina had no network project upgrades in 2021.

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.

North Carolina – 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.

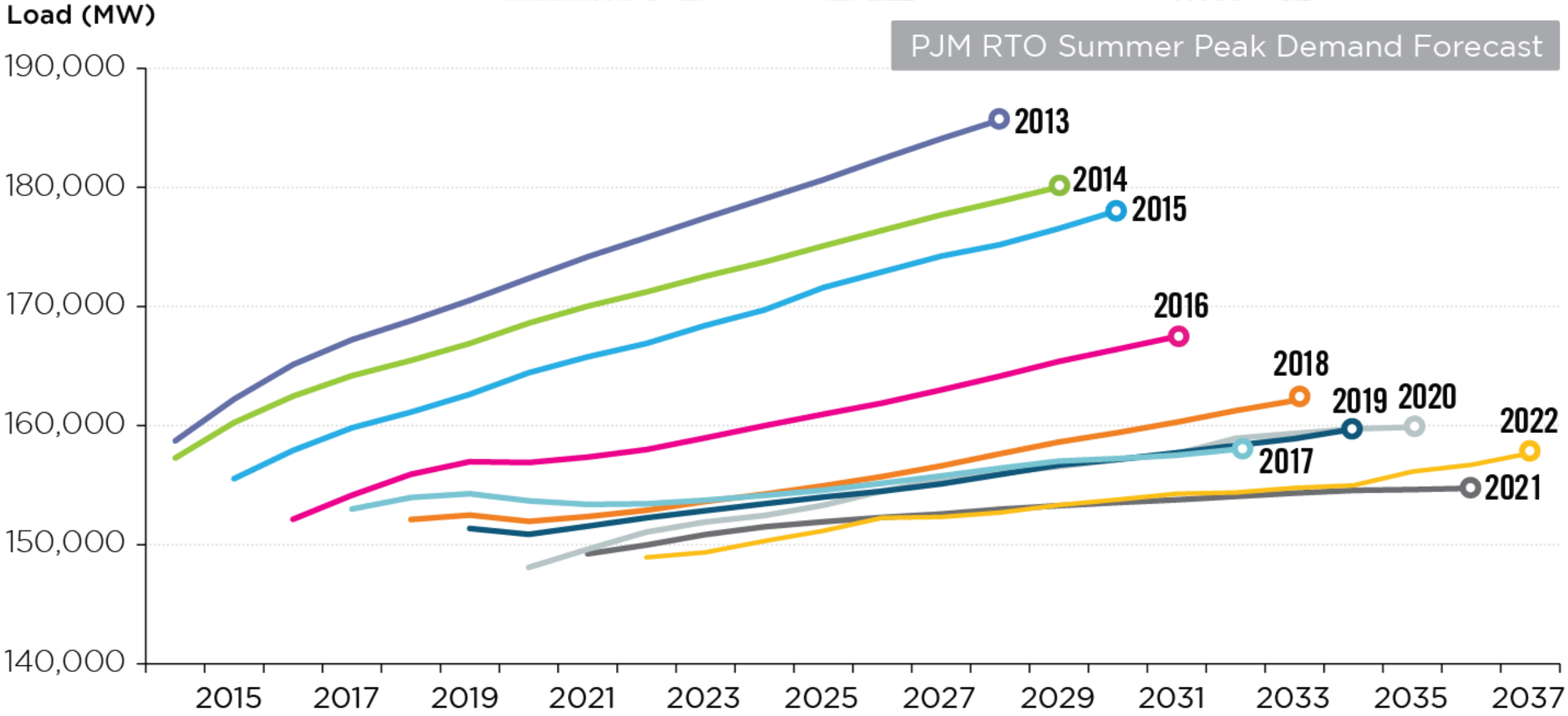
North Carolina – TO Supplemental Projects

Map ID	Project	Description	Projected In-Service Date	Project Cost ($M)	TO Zone	TEAC Date
1	S2501	Rebuild 114kV Line No. 1001 (Battleboro – Chestnut) to current 115kV standards with a minimum summer rating of 261 MVA.	12/15/2024	$14.00	Dominion	11/18/2020
2	S2502	Rebuild 115kV Line No. 1024 (Chestnut –South Justice Branch) to current 115kV standards with a minimum summer rating of 261 MVA.	12/31/2023	$5.10		
3	S2612	Rebuild ~1.8 miles single circuit segment of 230kV Line #239 Lakeview-Hornertown to current 230kV standards. The normal summer rating of this line segment will be 1047MVA. Rebuild approximately 0.9 mile double circuit segment of 230kV Line #239 and 230kV Line No. 2141 Carolina-Lakeview to current 230kV standards. The normal summer rating of the line segments will be 1047MVA.	12/31/2022	$5.00		6/8/2021
4	S2618	Rebuild ~12.4 miles of the Everetts-Parmele 115 kV line. New conductor with a minimum normal summer rating of 262 MVA will be used.	12/31/2022	$27.00		3/18/2021

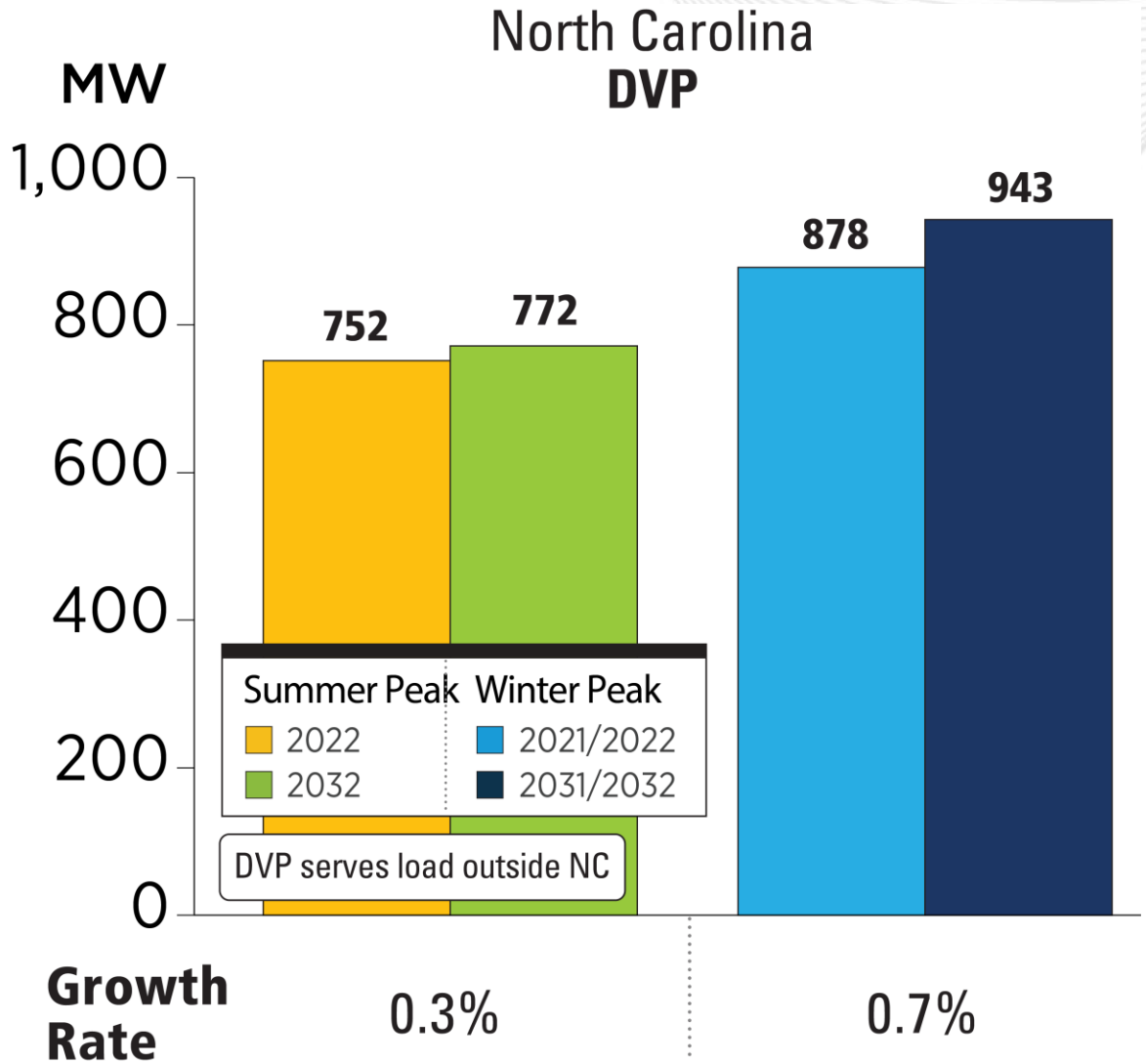
Planning
Load Forecast

PJM Annual Load Forecasts

(Jan. 2022)



North Carolina – 2022 Load Forecast Report



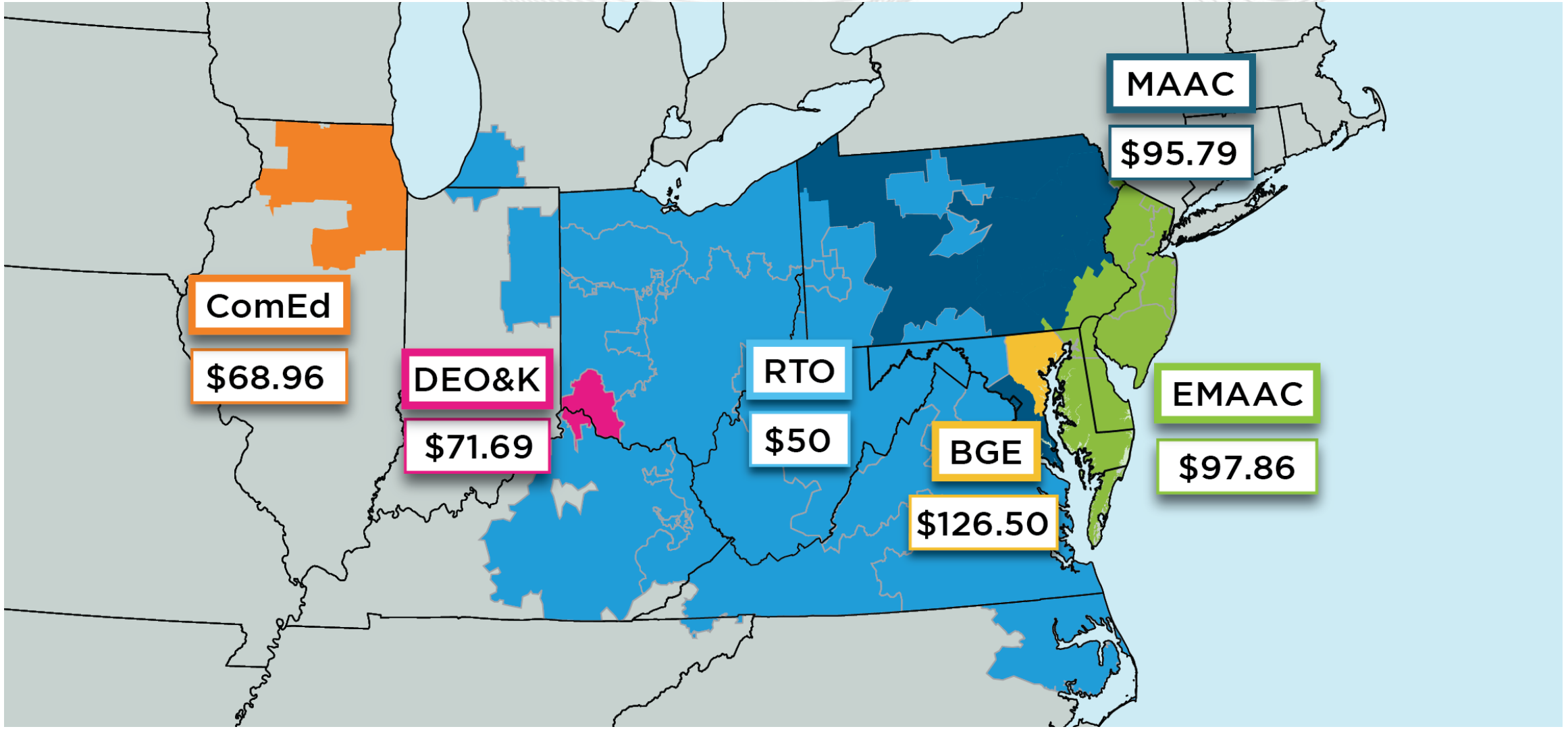
PJM RTO Summer Peak		PJM RTO Winter Peak	
2022	2032	2021/2022	2031/2032
149,938 MW	154,381 MW	132,102 MW	141,516 MW
Growth Rate 0.4%		Growth Rate 0.7%	

* PJM notes that Dominion Virginia Power serves load other than in North Carolina. The Summer Peak and Winter Peak MW values in this table each reflect the estimated amount of forecasted load to be served by Dominion Virginia Power solely in North Carolina and excludes impacts of datacenter loads. Estimated amounts were calculated based on the average share of Dominion Virginia Power 's real-time summer and winter peak load located in North Carolina over the past five years excluding datacenter load estimates.

Markets

Capacity Market Results

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



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

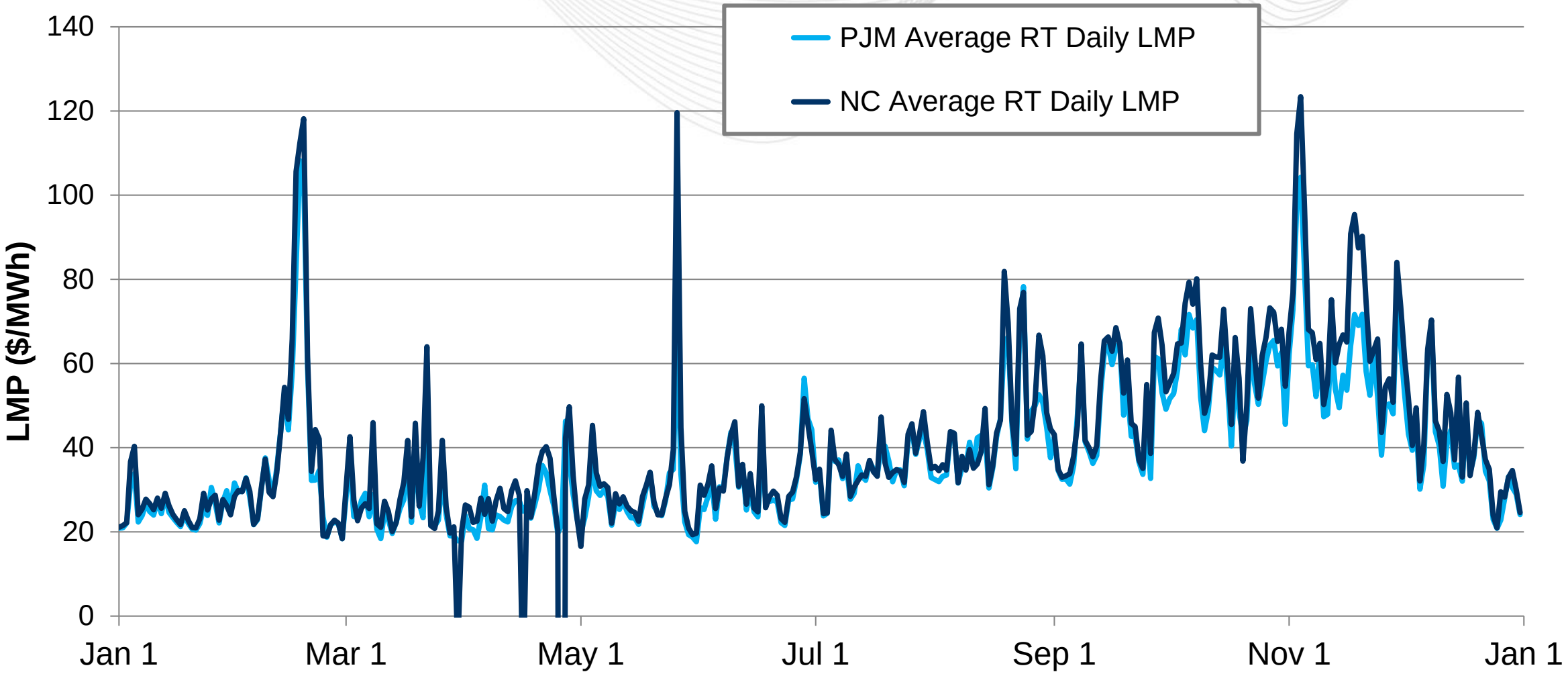
	ANNUAL	SUMMER	WINTER	Total (MW)
Generation	130,844.9	9.9	686.8	131,541.6
DR	8,369.9	442.0	0.0	8,811.9
EE	4,575.7	234.9	0.0	4,810.6
Total (MW)	143,790.5	686.8	686.8	

Markets

Market Analysis

North Carolina – Average Daily LMP

(Jan. 1, 2021 – Dec. 31, 2021)

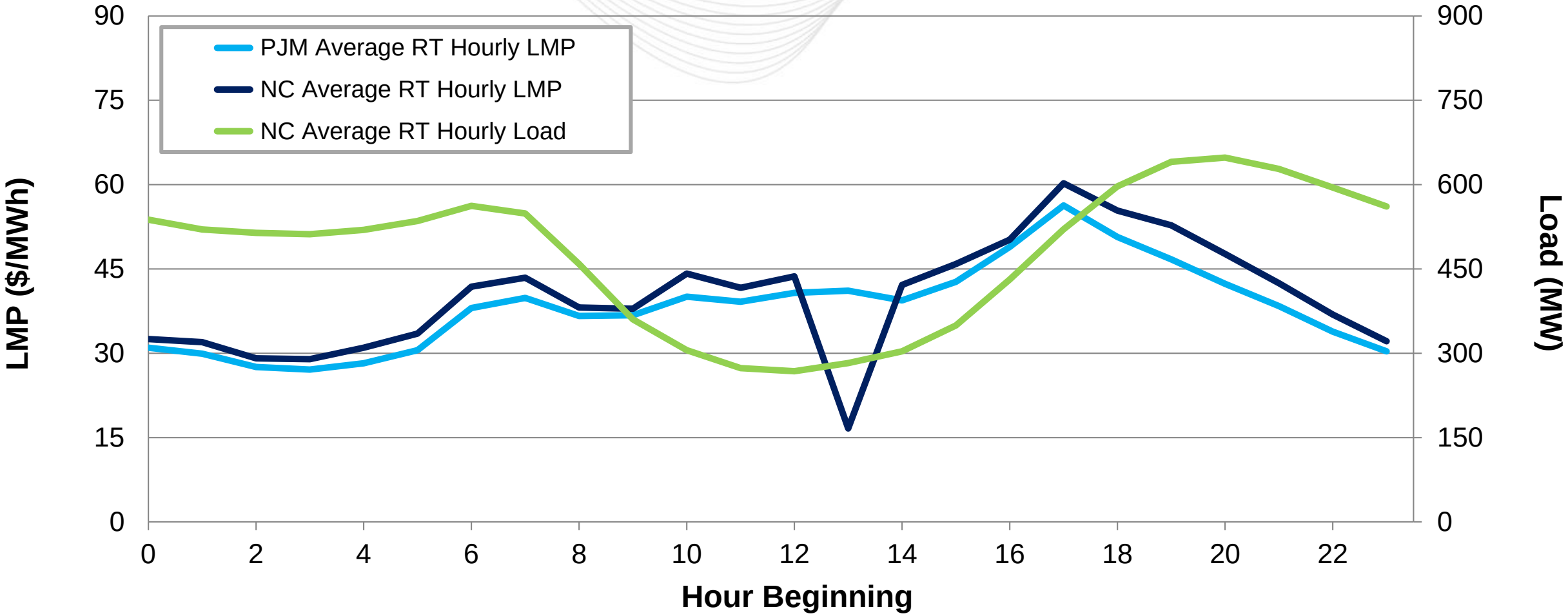


North Carolina had negative average daily LMPs on March 30, April 16, and April 30.

North Carolina – Average Hourly LMP and Load

(Jan. 1, 2021 – Dec. 31, 2021)

North Carolina's average hourly LMPs were slightly above the PJM average hourly LMP, except during mid-day hours.



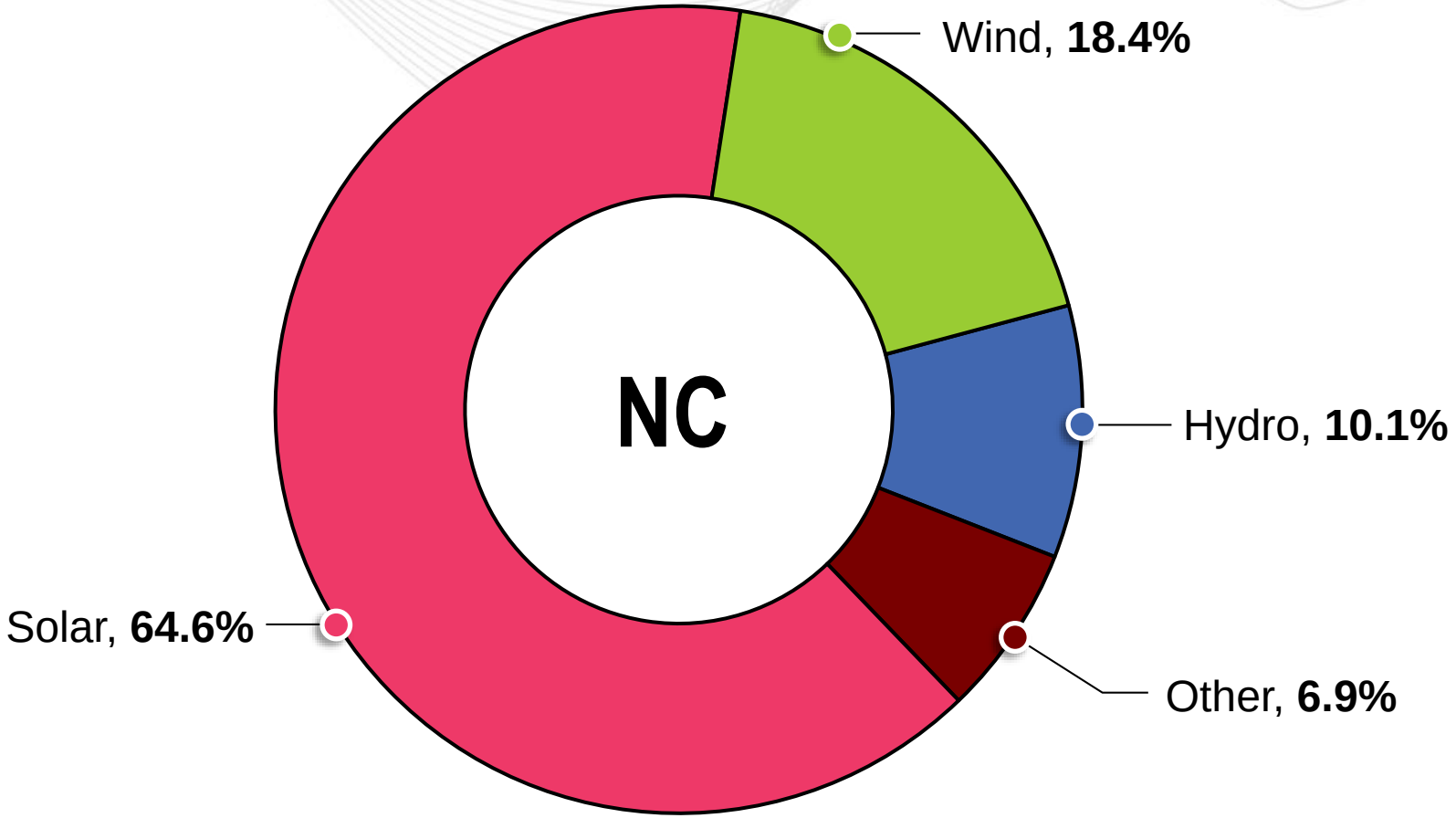
North Carolina – Net Energy Import/Export Trend

(Jan. 2021 – Dec. 2021)

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

Operations

North Carolina – 2021 Generator Production



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

2005 – 2021 PJM Average Emissions