



2019 North Carolina State Infrastructure Report

(January 1, 2019 – December 31, 2019)

May 2020
(updated July 2020)

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

1. Planning

- Generation Portfolio Analysis
- Transmission Analysis
- Load Forecast

2. Markets

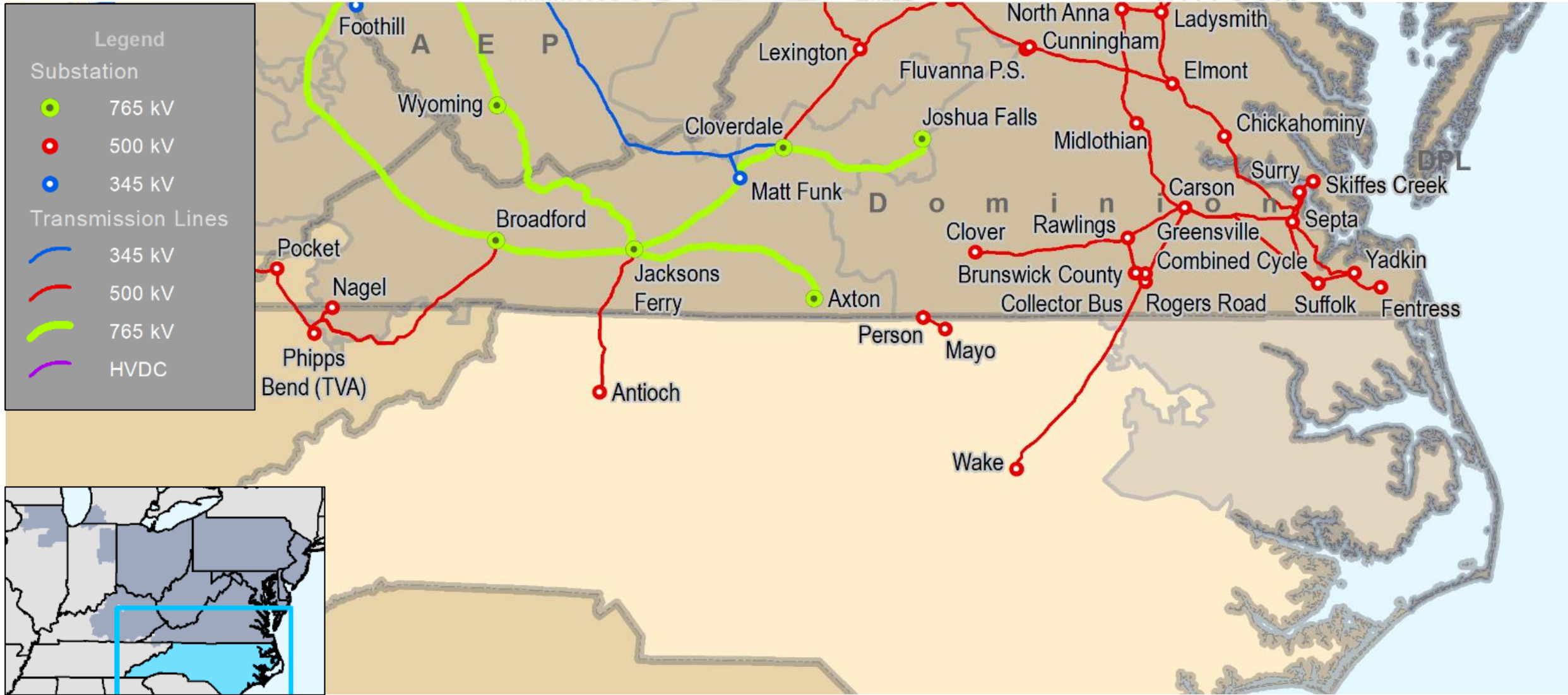
- Market Analysis

3. Operations

- Emissions Data

- **Existing Capacity:** Solar represents approximately 39.1 percent of the total installed capacity in the North Carolina service territory while hydro represents approximately 36.3 percent.
- **Interconnection Requests:** Solar represents 95.2 percent of new interconnection requests in North Carolina.
- **Deactivations:** No generation in North Carolina gave notification of deactivation in 2019.
- **RTEP 2019:** North Carolina's 2019 RTEP projects total approximately \$13 million in investment. This total captures only RTEP projects that cost at least \$5 million.

- **Load Forecast:** North Carolina's load within the PJM footprint is projected to grow between 1.2 and 1.4 percent annually over the next ten years. Comparatively, the overall PJM RTO projected load growth rate is 0.6 percent.
- **2022/23 Capacity Market:** No Base Residual Auction was conducted in 2019. For the most recent auction results, please see the 2018 North Carolina State Infrastructure Report.
- **1/1/19 – 12/31/19 Market Performance:** North Carolina's average hourly LMPs were slightly above PJM average hourly LMPs.



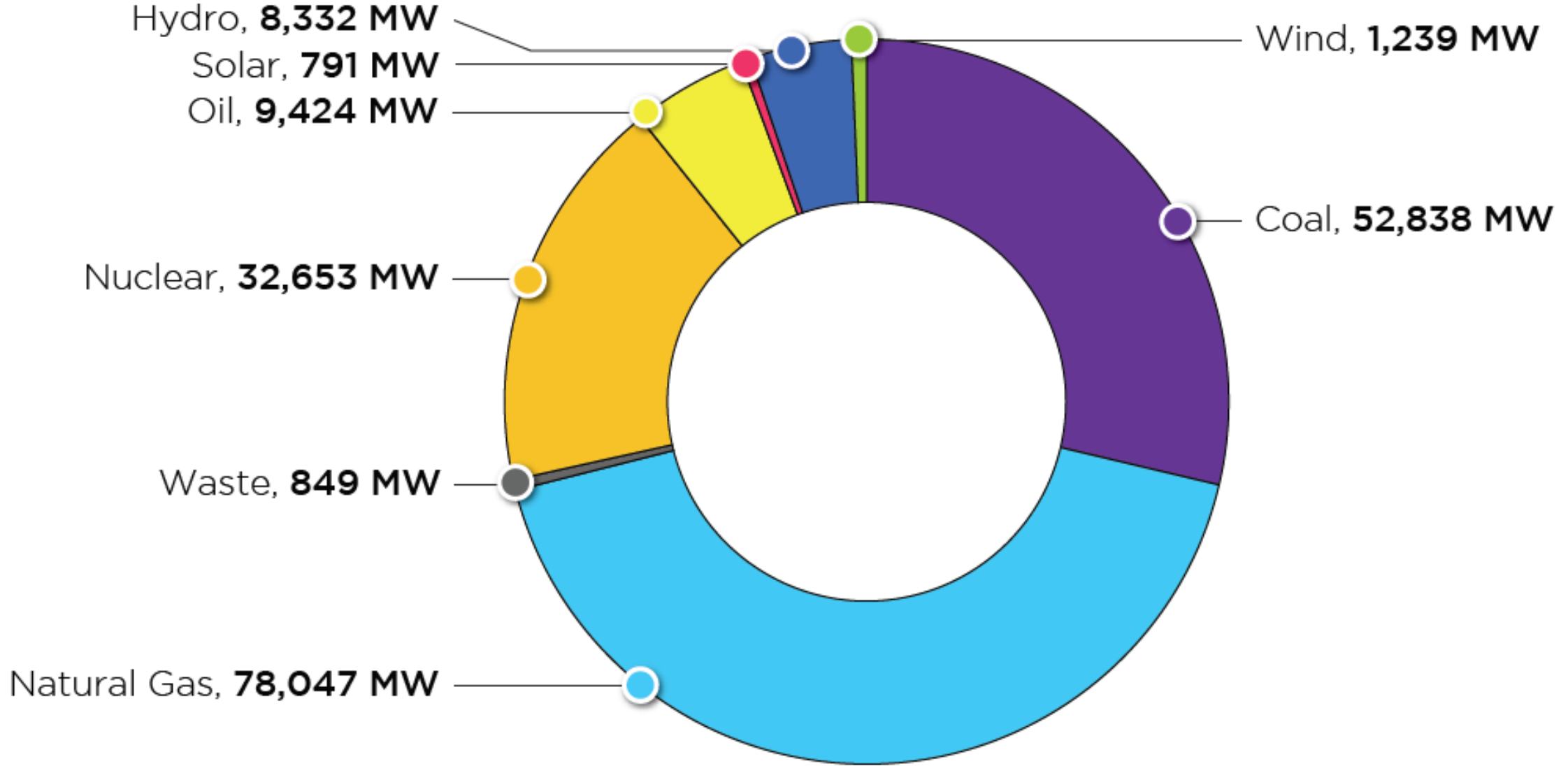
Planning

Generation Portfolio Analysis



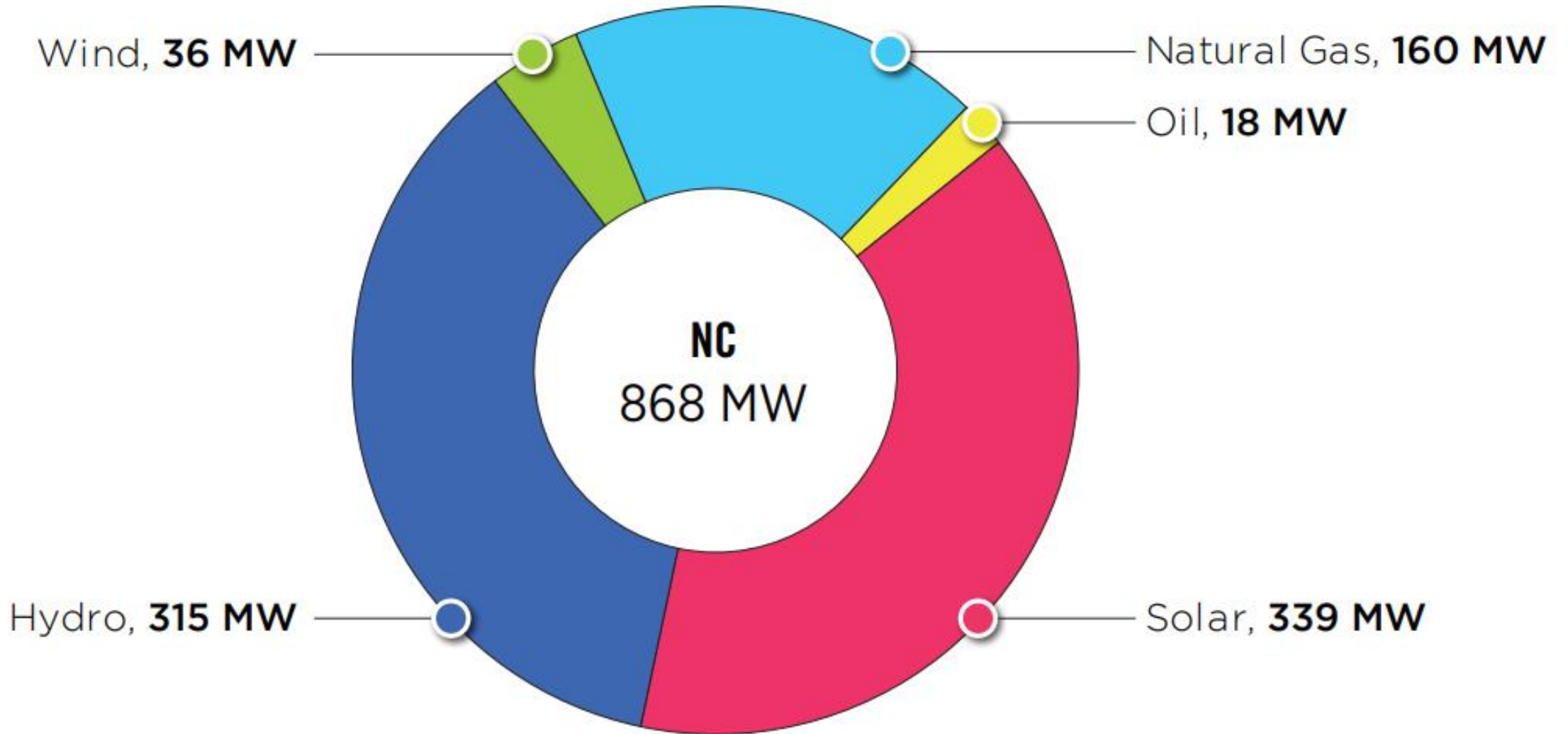
PJM – Existing Installed Capacity

(CIRs – as of Dec. 31, 2019)



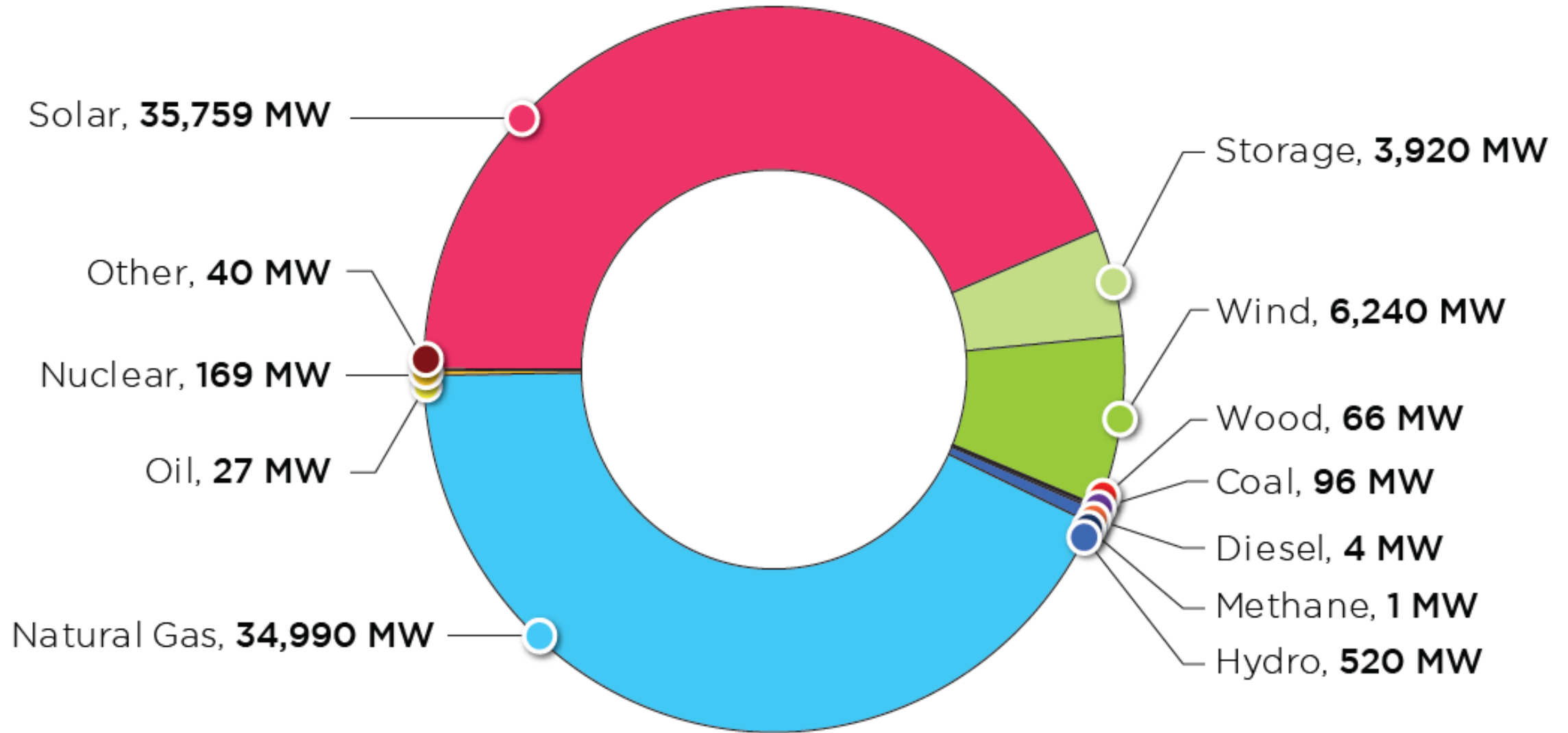
North Carolina – Existing Installed Capacity

(CIRs – as of Dec. 31, 2019)



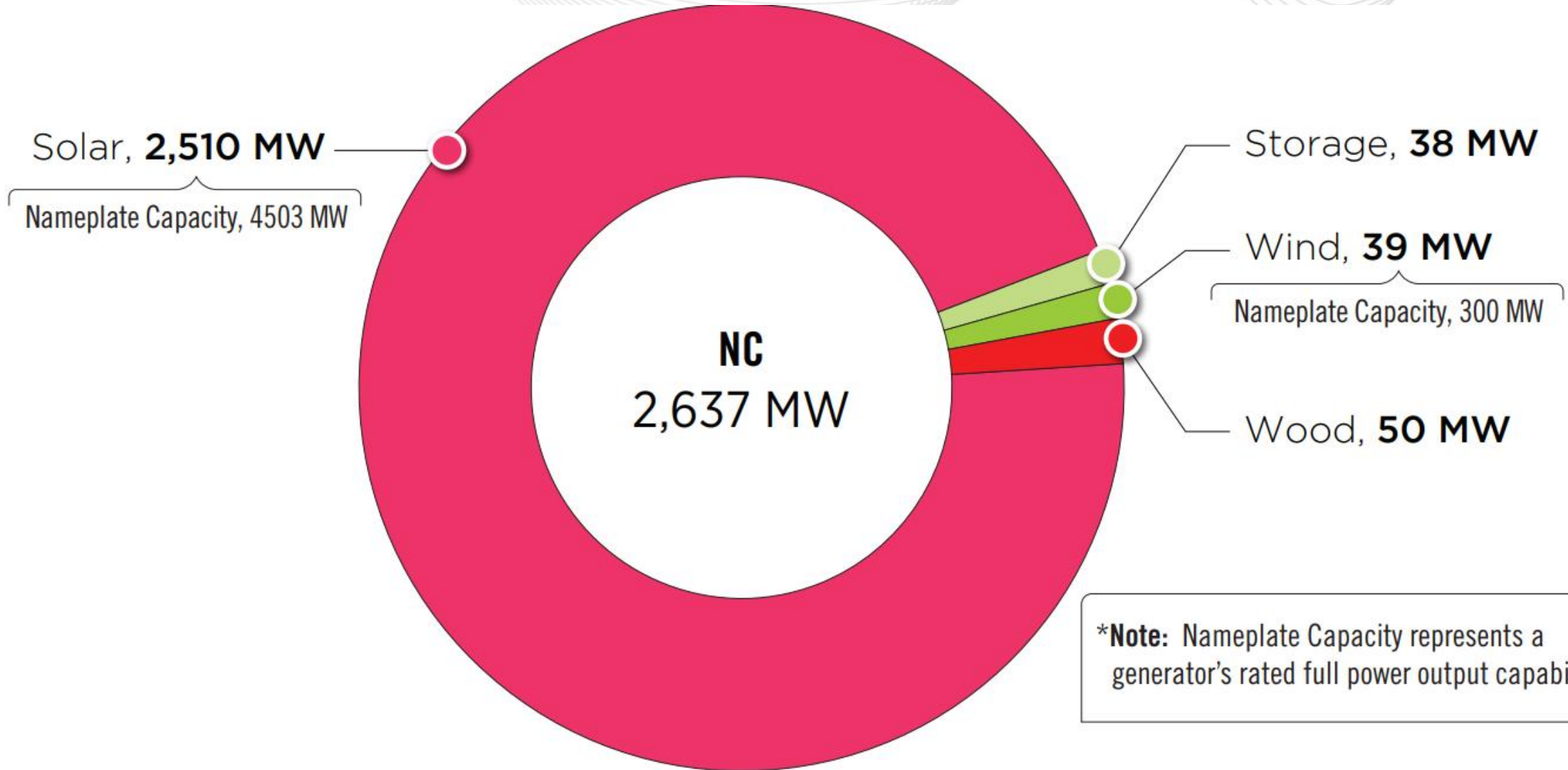
PJM – Queued Capacity (MW) by Fuel Type

(Requested CIRs – as of Dec. 31, 2019)



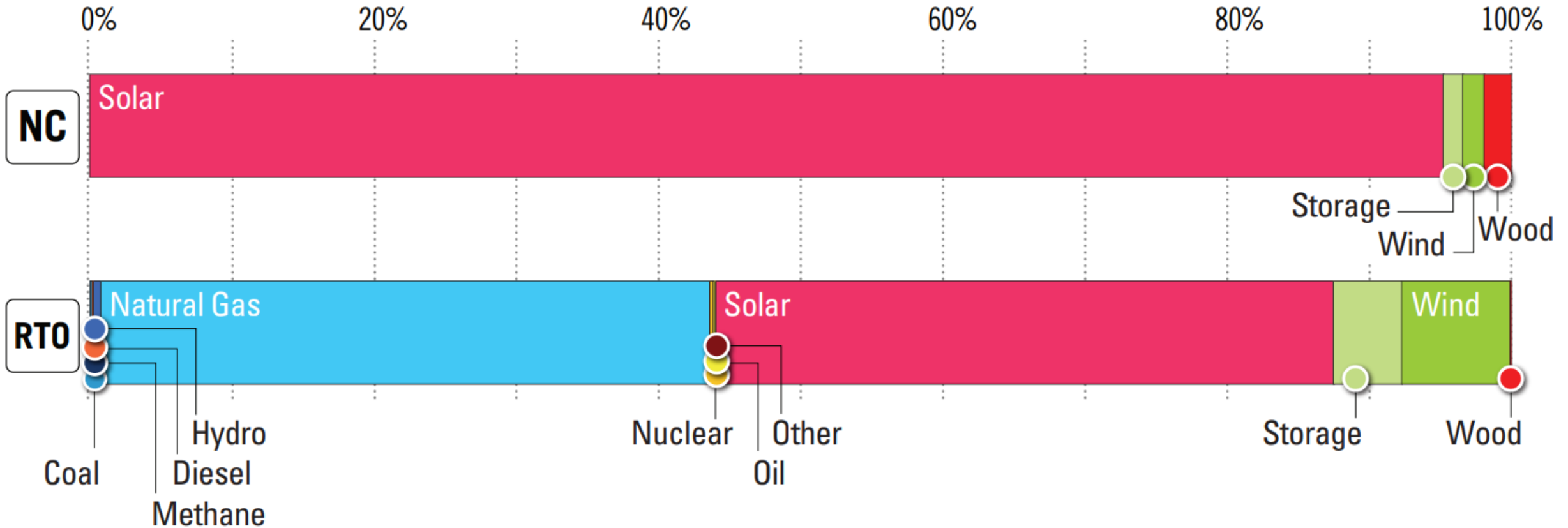
North Carolina – Queued Capacity (MW) by Fuel Type

(Requested CIRs – as of Dec. 31, 2019)



North Carolina – Percentage of MW in Queue by Fuel Type

(Dec. 31, 2019)





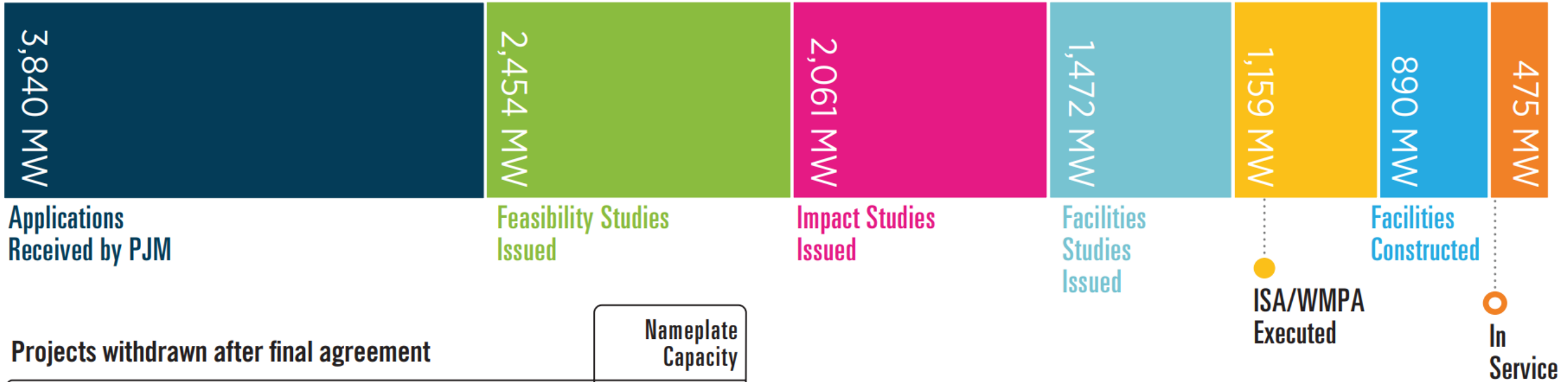
North Carolina – Interconnection Requests

(Unforced Capacity – as of Dec. 31, 2019)

		In Queue						Complete				Grand Total	
		Active		Suspended		Under Construction		In Service		Withdrawn			
		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	Storage	2	38.0	0	0.0	0	0.0	0	0.0	3	50.0	5	88.0
Renewable	Methane	0	0.0	0	0.0	0	0.0	0	0.0	1	12.0	1	12.0
	Solar	32	2,094.8	1	84.0	10	331.3	14	359.1	69	2,612.1	126	5,481.3
	Wind	0	0.0	0	0.0	1	39.0	1	27.0	9	195.3	11	261.3
	Wood	0	0.0	0	0.0	1	50.0	0	0.0	1	80.0	2	130.0
Grand Total		34	2,132.8	1	84.0	12	420.3	15	386.1	83	2,949.4	145	5,972.6

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

North Carolina – Progression History of Interconnection Requests



Projects withdrawn after final agreement

		Nameplate Capacity
7	Interconnection Service Agreements	234 MW / 743 MW
3	Wholesale Market Participation Agreements	34 MW / 50 MW

Percentage of planned capacity and projects that have reached commercial operation	12%	16%
	Requested capacity megawatt	Requested projects

This graphic shows the final state of generation submitted in all PJM queues that reached in-service operation, began construction, or was suspended or withdrawn as of Dec. 31, 2019.



North Carolina – Generation Deactivation Notifications Received in 2019

North Carolina had no generation deactivation notifications in 2019.

Planning

Transmission Infrastructure Analysis

Please note that PJM 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 included in this state report. However, only projects that are \$10 million and above are displayed on the project maps.

For a complete list of all RTEP projects, please visit the “RTEP Upgrades & Status – Transmission Construction Status” page on [pjm.com](https://www.pjm.com).

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



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



North Carolina – RTEP Baseline Projects

(Greater than \$5 million)

Map ID	Project	Description	Projected In-Service Date	Project Cost (\$M)	TO Zone	TEAC Date
1	b3122	Rebuild Hathaway-Rocky Mount (Duke Energy Progress) 230 kV Line No. 2181 and Line No. 2058 with double-circuit steel structures using double-circuit conductor at current 230 kV standards with a minimum rating of 1047 MVA.	6/1/2019	\$13.0	Dominion	6/13/2019



North Carolina – RTEP Network Projects

(Greater than \$5 million)

North Carolina had no network project upgrades in 2019.

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.



North Carolina – TO Supplemental Projects

(Greater than \$5 million)

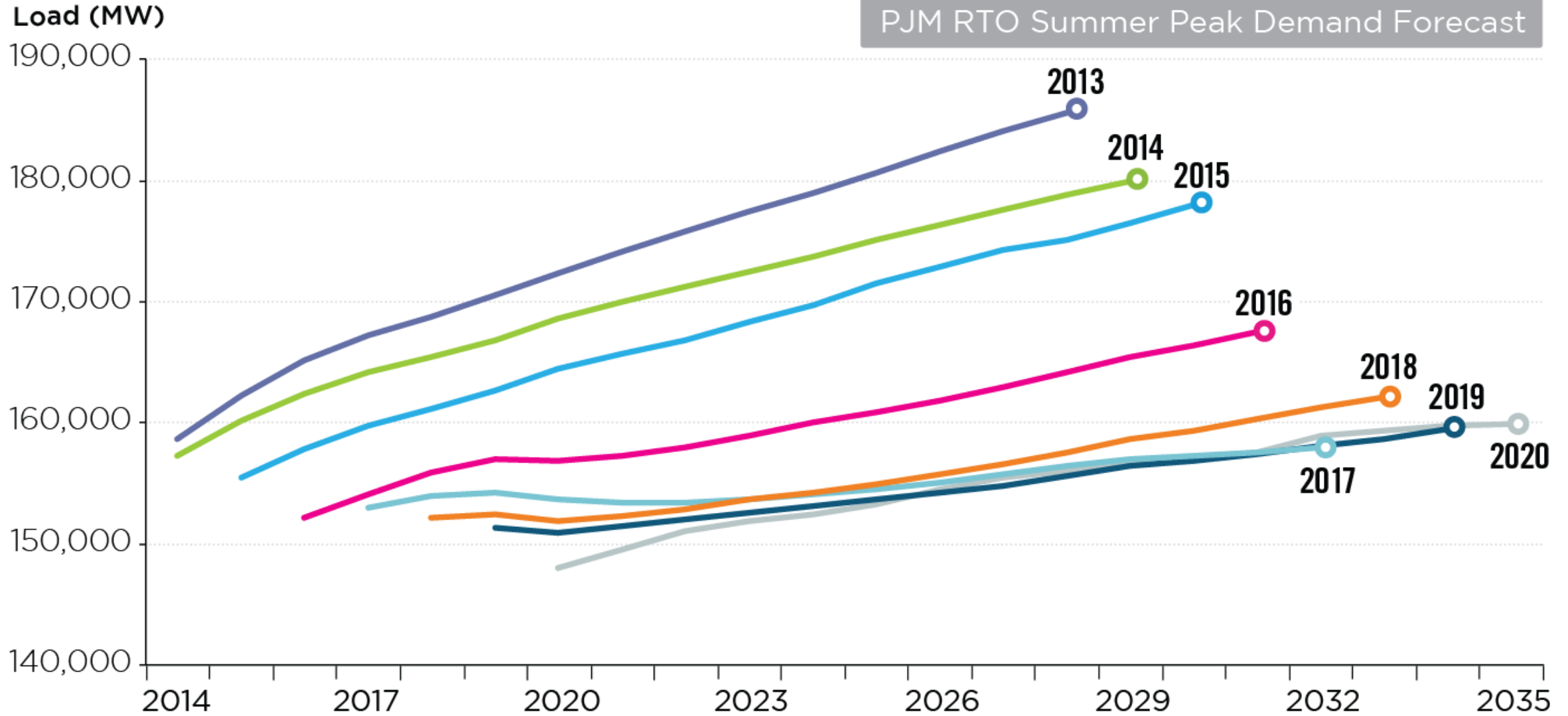
North Carolina had no supplemental project upgrades in 2019.

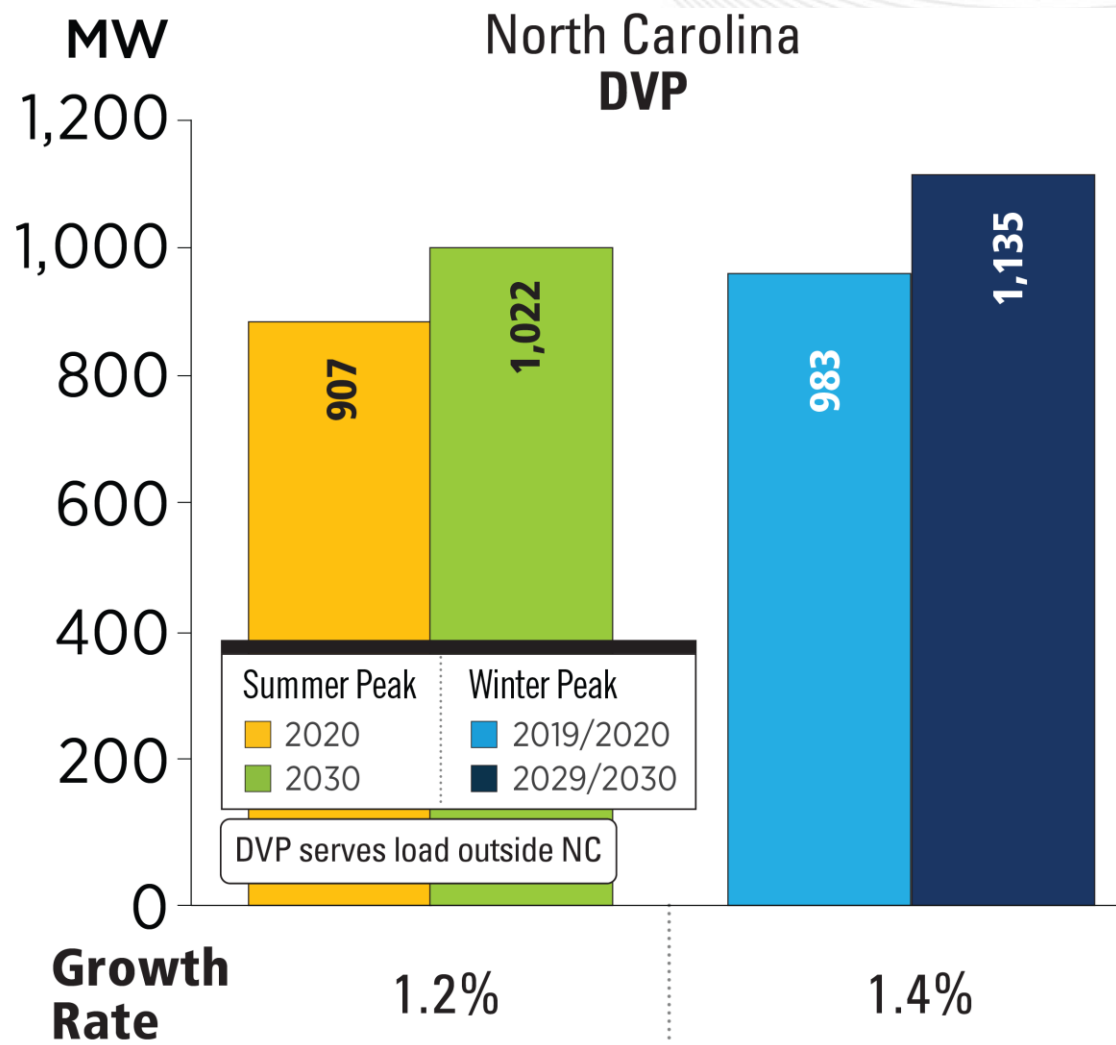
Note: Supplemental projects are transmission expansions or enhancements that are not required for compliance with PJM criteria and are not state public policy projects according to the PJM Operating Agreement. These projects are used as inputs to RTEP models, but are not required for reliability, economic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

Planning

Load Forecast

PJM RTO Summer Peak Demand Forecast





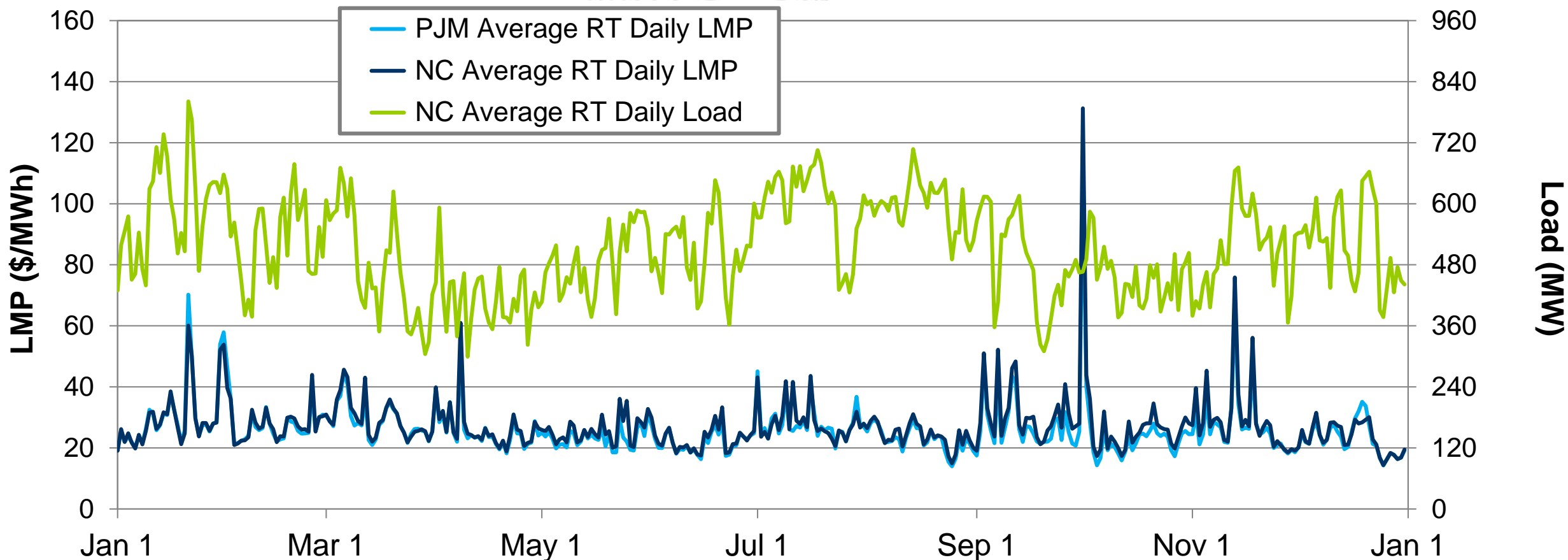
PJM RTO Summer Peak		PJM RTO Winter Peak	
2020	2030	2019/2020	2029/2030
148,092 MW	157,132 MW	131,287 MW	139,970 MW
Growth Rate 0.6%		Growth Rate 0.6%	

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

The Load Forecast was produced prior to COVID-19 and will be updated before the next Base Residual Auction to reflect changes in load patterns.

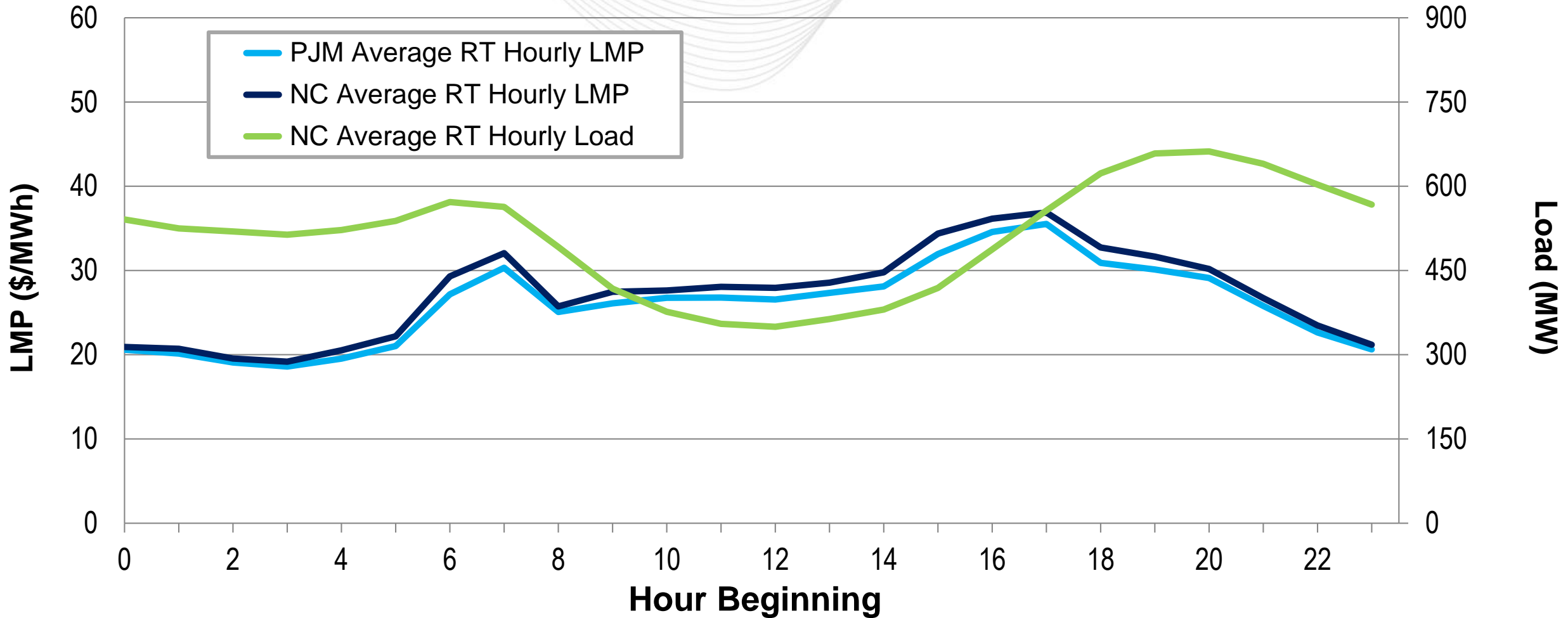
Markets

Market Analysis



Note: The price spike in October reflects the Performance Assessment Interval event that occurred on October 2nd.

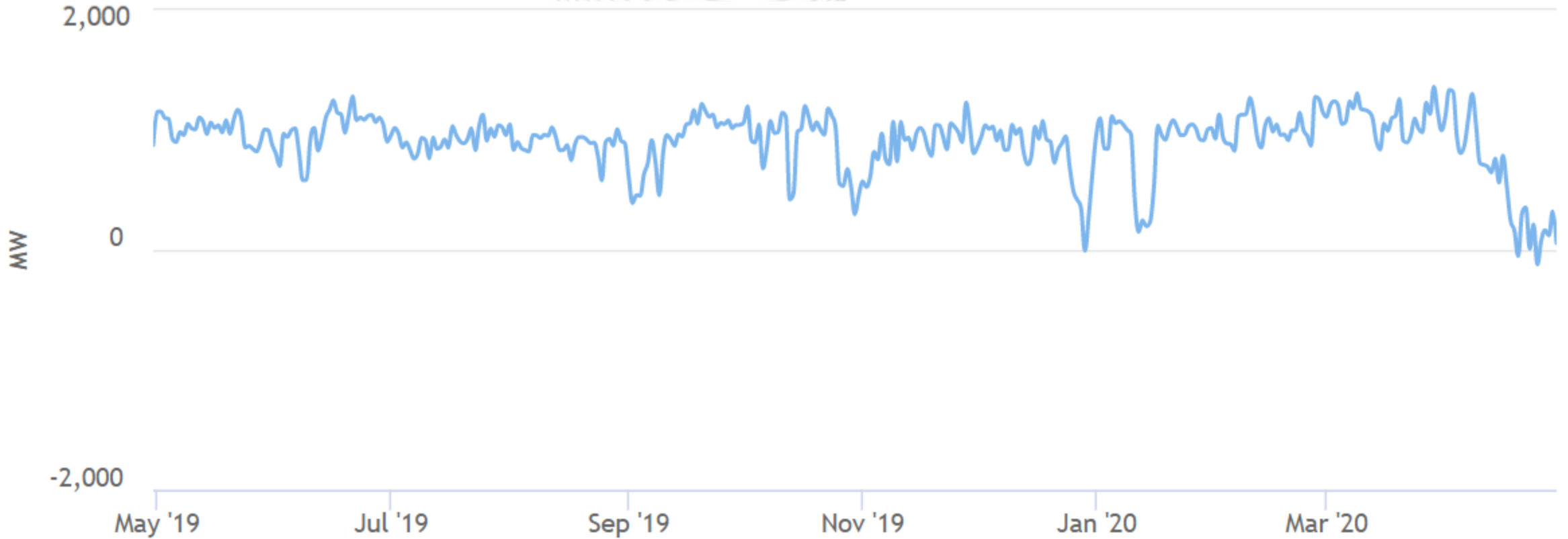
North Carolina's average hourly LMPs were slightly above the PJM average hourly LMP.





North Carolina – Net Energy Import/Export Trend

(May 2019 – April 2020)



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

Operations Emissions Data



2005 – 2019 PJM Average Emissions

