# 2020 North Carolina State Infrastructure Report

## (January 1, 2020 – December 31, 2020)

April 2021

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


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- **Existing Capacity:** Solar represents approximately 42.7 percent of the total installed capacity in the North Carolina service territory while hydro represents approximately 34.1 percent.
- **Interconnection Requests:** Solar represents 89.2 percent of new interconnection requests in North Carolina.
- **Deactivations:** No generation in North Carolina gave notification of deactivation in 2020.
- **RTEP 2020:** North Carolina's 2020 RTEP projects total approximately $5.28 million, which comes from one network upgrade project. This investment figure only represents RTEP projects that cost at least $5 million, and the listed network project's cost is borne by the interconnecting customer.


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- **Load Forecast:** North Carolina's peak load within the PJM footprint is projected to grow 0.9 percent annually over the next ten years. Comparatively, the overall PJM RTO projected load growth rate is 0.3 percent.
- **2022/23 Capacity Market:** No Base Residual Auction was conducted in 2020. For the most recent auction results, please see the 2018 North Carolina State Infrastructure Report.
- **1/1/20 – 12/31/20 Market Performance:** North Carolina's average hourly LMPs aligned with the PJM average hourly LMP.


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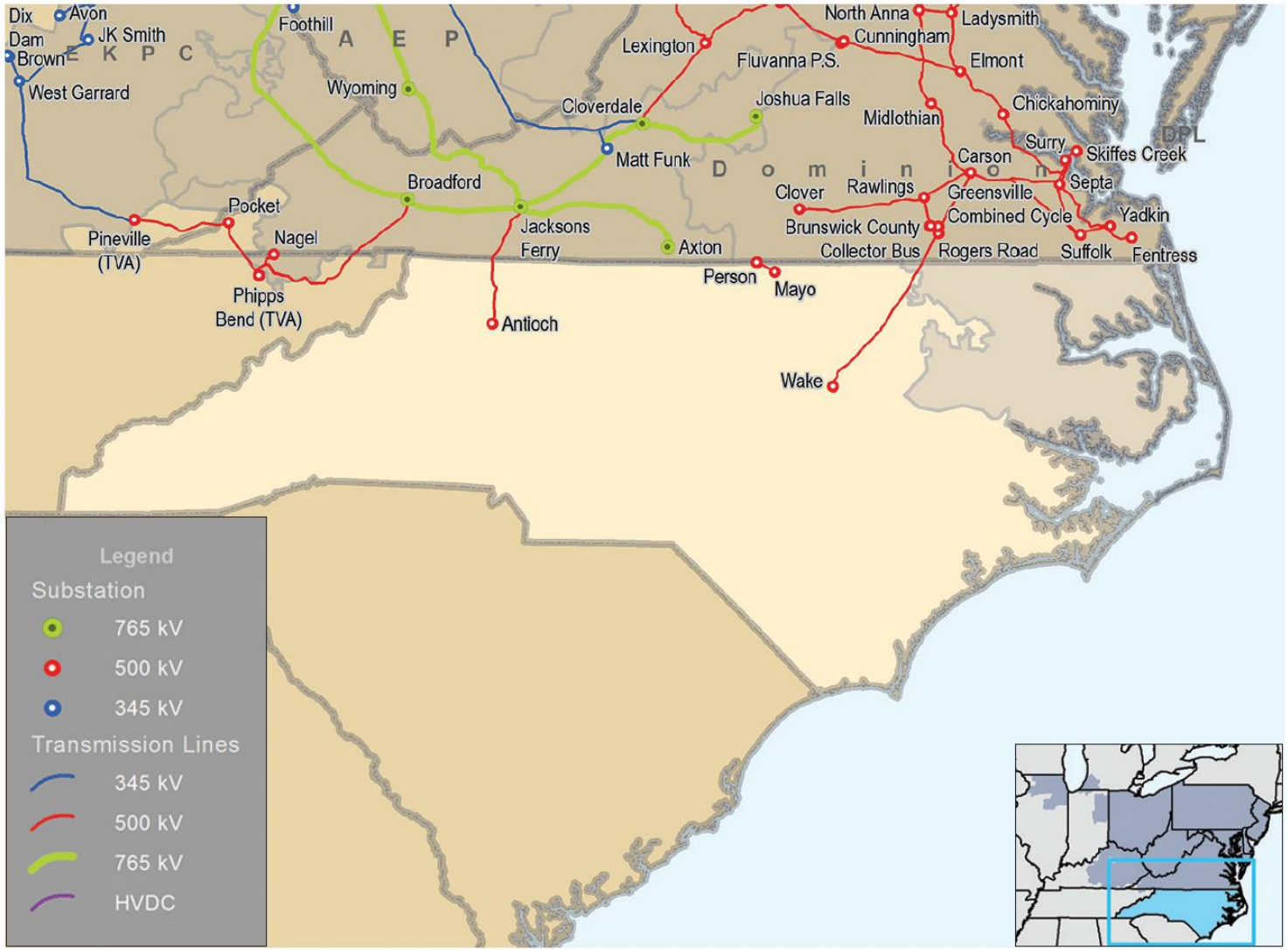
# PJM Service Area – North Carolina




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.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# Planning

## Generation Portfolio Analysis


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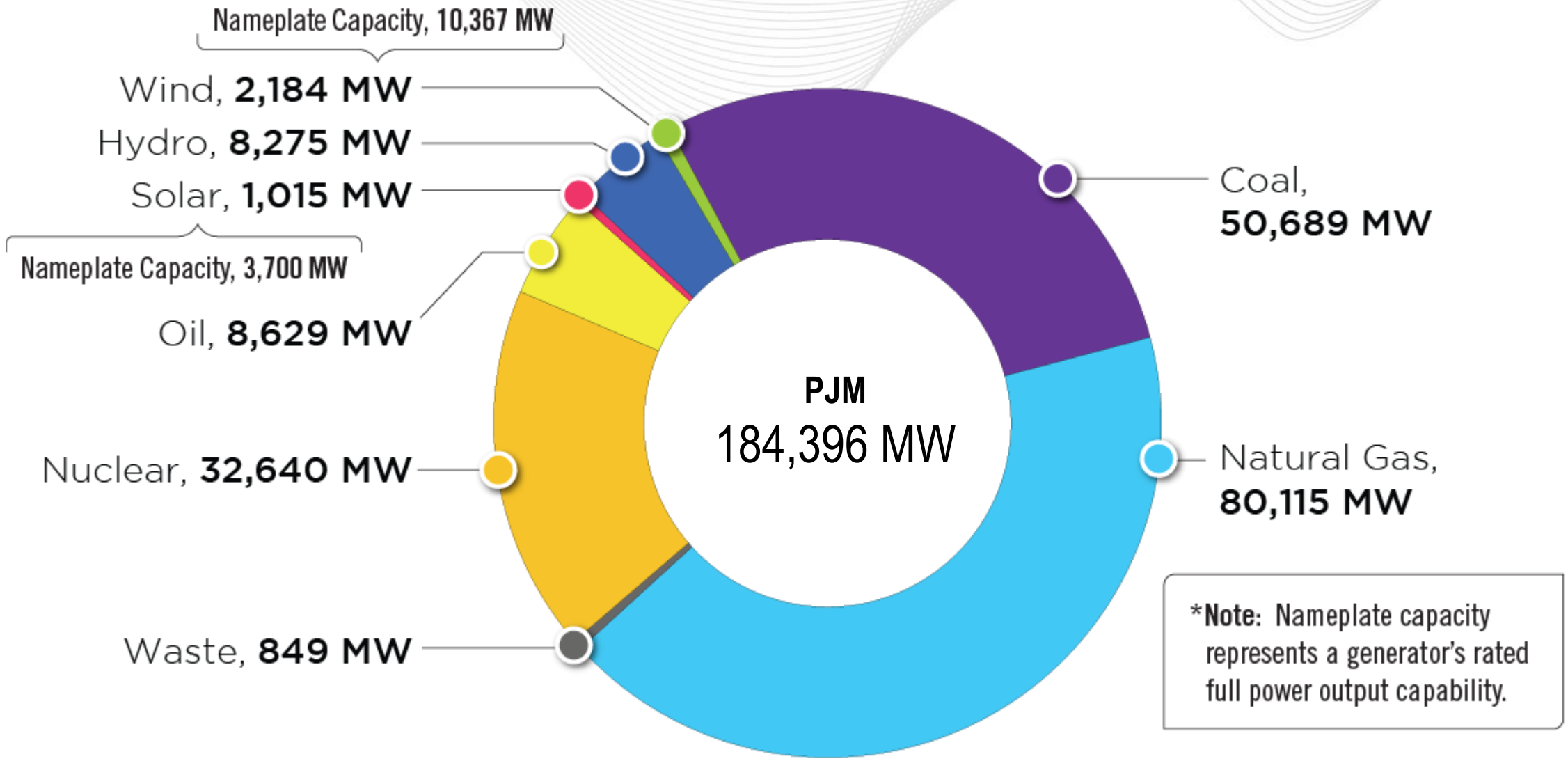
# PJM – Existing Installed Capacity

(CIRs – as of Dec. 31, 2020)





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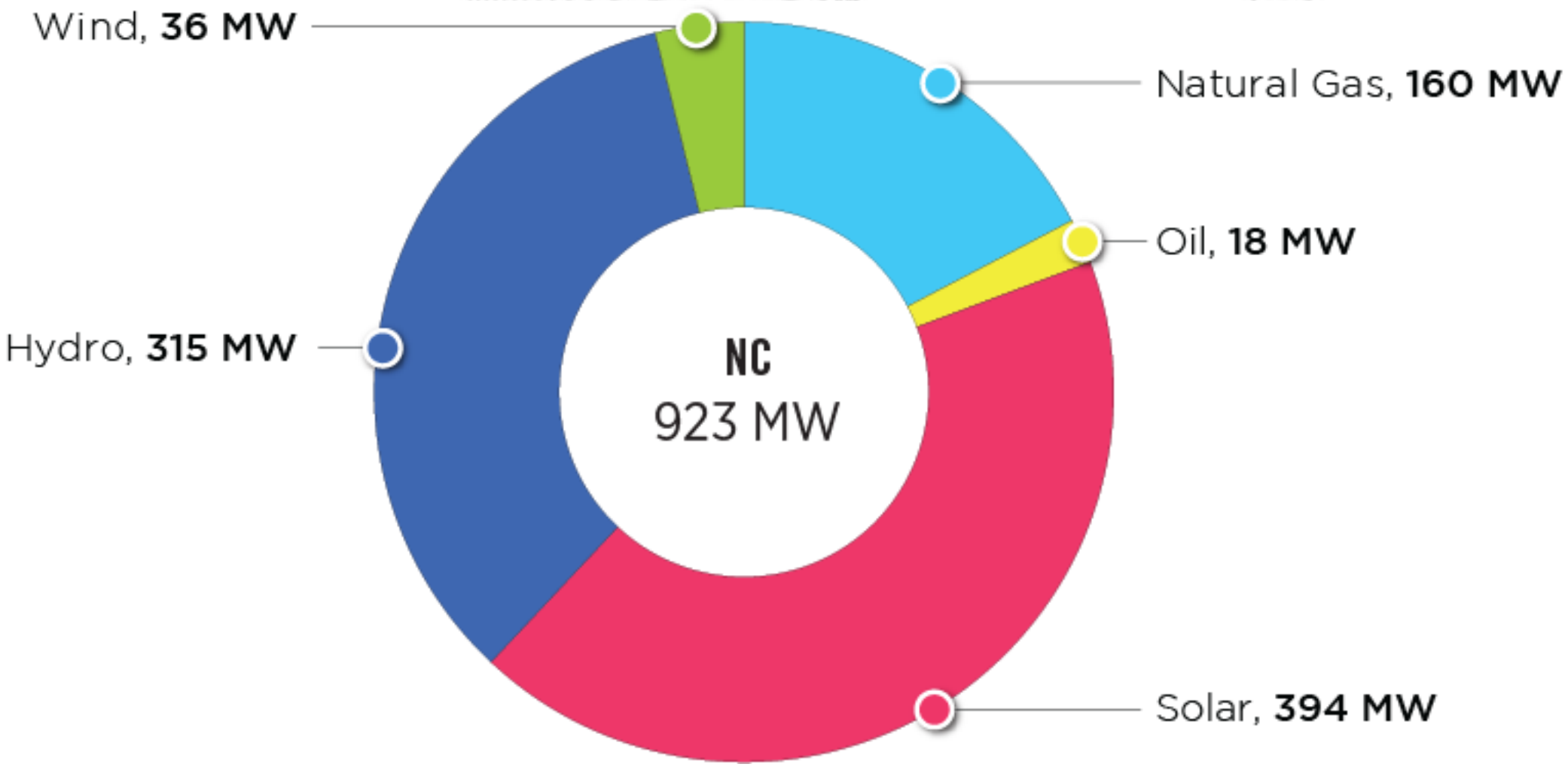
# North Carolina – Existing Installed Capacity

(CIRs – as of Dec. 31, 2020)





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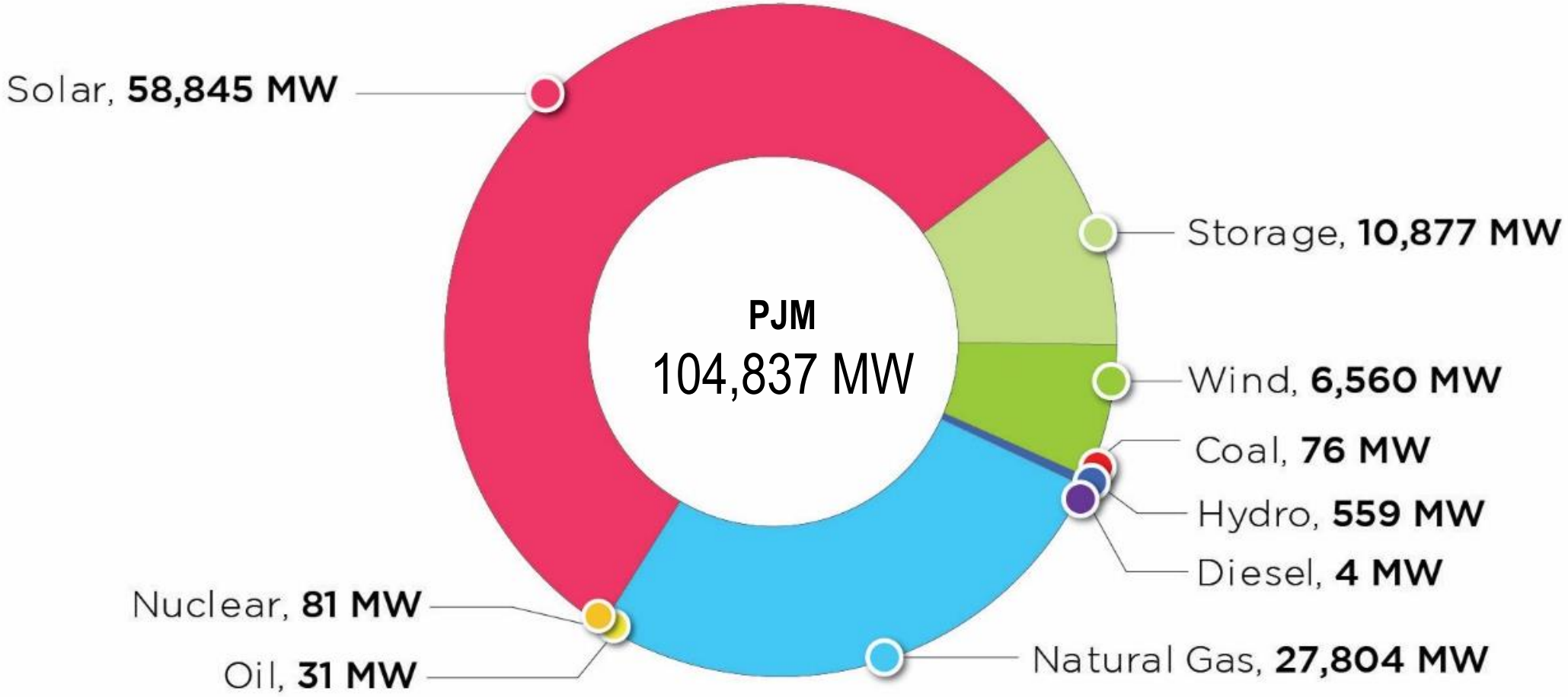
# PJM – Queued Capacity (MW) by Fuel Type

(Requested CIRs – as of Dec. 31, 2020)





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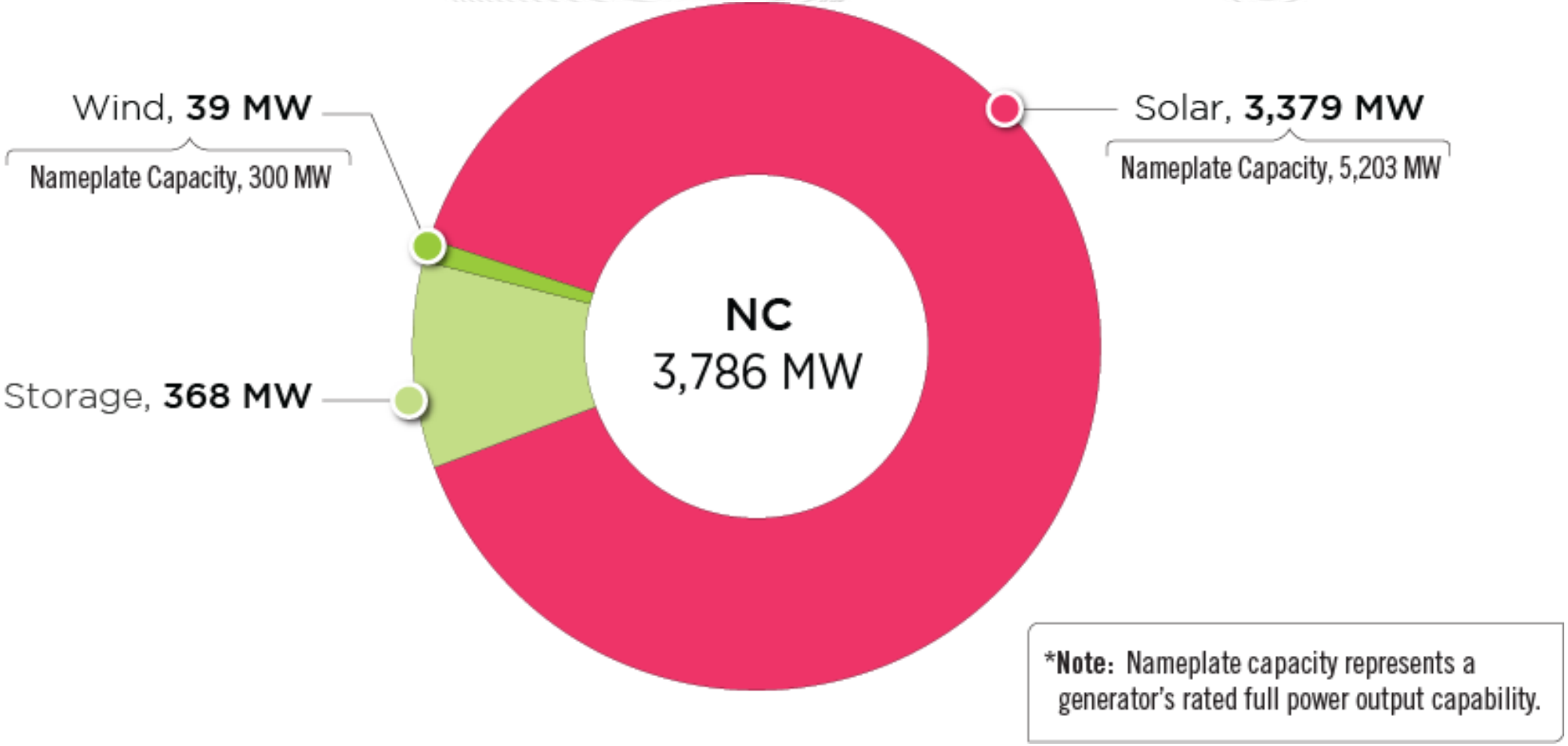
(Requested CIRs – as of Dec. 31, 2020)





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# North Carolina – Interconnection Requests by Fuel Type

(Unforced Capacity – as of Dec. 31, 2020)

| | | In Queue | | | | | | Complete | | | | Grand Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Active | | Suspended | | Under Construction | | In Service | | Withdrawn | | | |
| | | Projects | Capacity (MW) | Projects | Capacity (MW) | Projects | Capacity (MW) | Projects | Capacity (MW) | Projects | Capacity (MW) | Projects | Capacity (MW) |
| Non-Renewable | Storage | 6 | 368.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 5 | 130.5 | 11 | 498.5 |
| Renewable | Methane | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 12.0 | 1 | 12.0 |
| | Solar | 44 | 2,905.1 | 2 | 87.5 | 11 | 386.8 | 17 | 465.1 | 83 | 3,166.5 | 157 | 7,011.0 |
| | 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** | 50 | 3,273.1 | 3 | 126.5 | 11 | 386.8 | 19 | 542.1 | 99 | 3,584.3 | 182 | 7,912.7 |

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


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# North Carolina – Progression History of Interconnection Requests


| Projects withdrawn after final agreement | | | Nameplate Capacity |
|---|---|---|---|
| 7 | Interconnection Service Agreements | 235 MW | 744 MW |
| 4 | Wholesale Market Participation Agreements | 38 MW | 55 MW |

| Percentage of planned capacity and projects that have reached commercial operation | 15% Requested capacity megawatts | 17 % Requested projects |
|---|---|---|

*This graphic shows the final state of generation submitted to the PJM queue that completed the study phase as of Dec. 31, 2020, 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, 2020.*


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# North Carolina – Generation Deactivation Notifications Received in 2020

North Carolina had no generation deactivation notifications in 2020.


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# Planning

## Transmission Infrastructure Analysis


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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/planning/project-construction


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# North Carolina – RTEP Baseline Projects

(Greater than $5 million)

North Carolina had no baseline project upgrades in 2020.

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


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# North Carolina – RTEP Network Projects

(Greater than $5 million)

| Map ID | Project | Description | Generation | Required In-Service Date | Project Cost ($M) | TO Zone | TEAC Date |
|---|---|---|---|---|---|---|---|
| | **n5995** | Three breaker | AC1-054 | 6/30/2018 | $5.28 | Dominion | 9/28/2020 |

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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# North Carolina – TO Supplemental Projects

(Greater than $5 million)

North Carolina had no supplemental project upgrades in 2020.

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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# Planning
## Load Forecast


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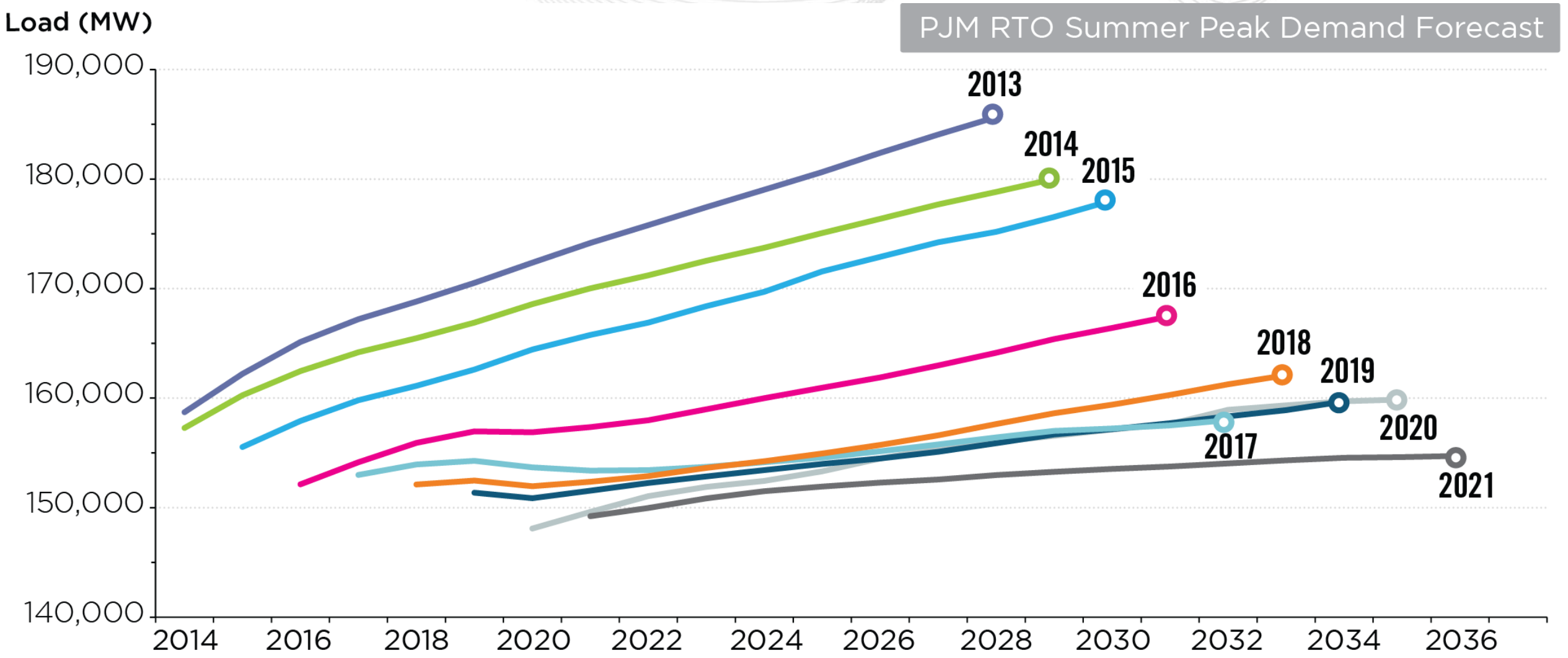
# PJM Annual Load Forecasts

(Jan. 2021)



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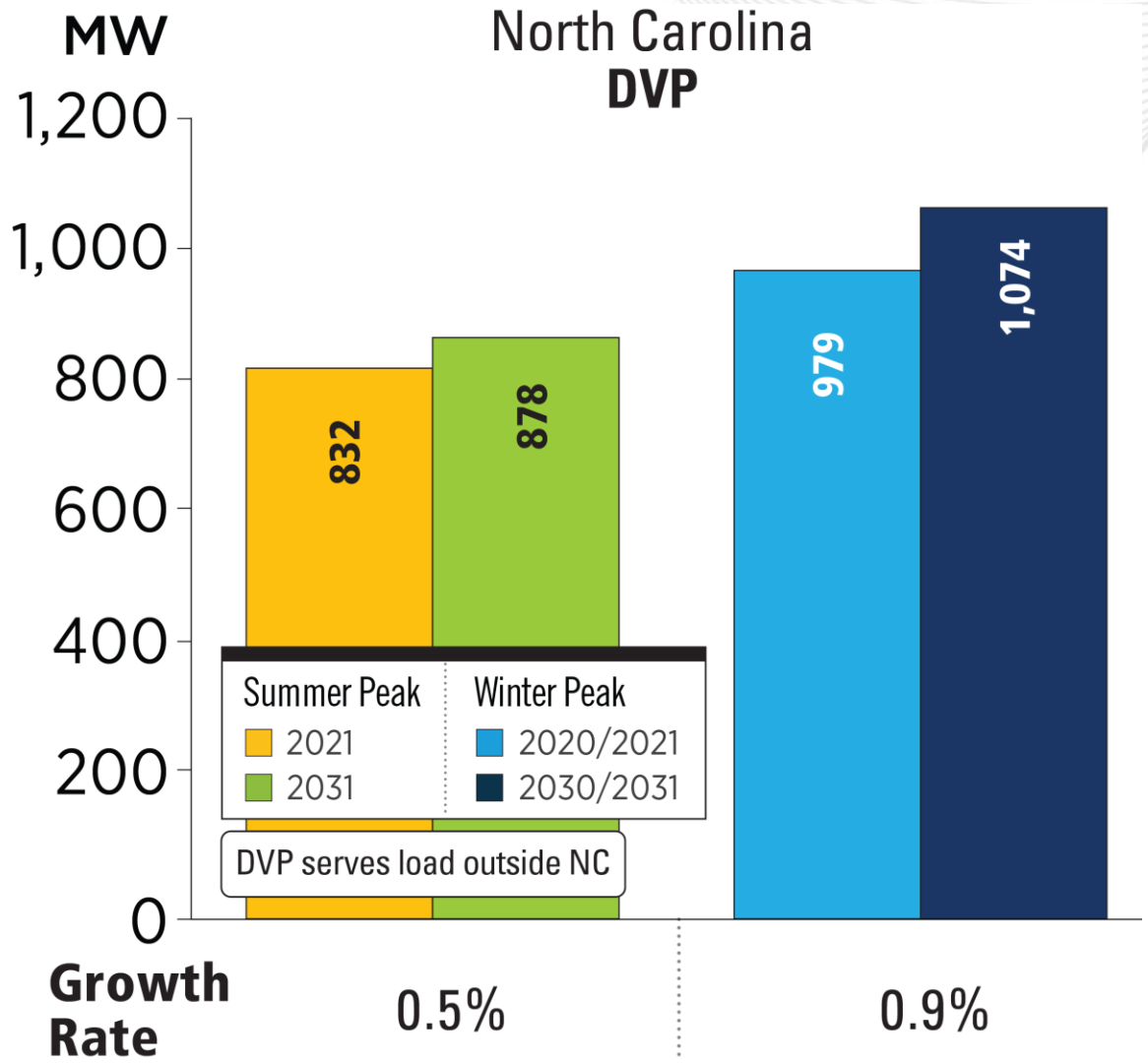
# North Carolina – 2021 Load Forecast Report




| PJM RTO Summer Peak | | PJM RTO Winter Peak | |
|---|---|---|---|
| 2021 | 2031 | 2020/2021 | 2030/2031 |
| 149,223 MW | 153,759 MW | 132,027 MW | 135,568 MW |
| Growth Rate 0.3% | | Growth Rate 0.2% | |

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/district. 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.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# Markets

Market Analysis


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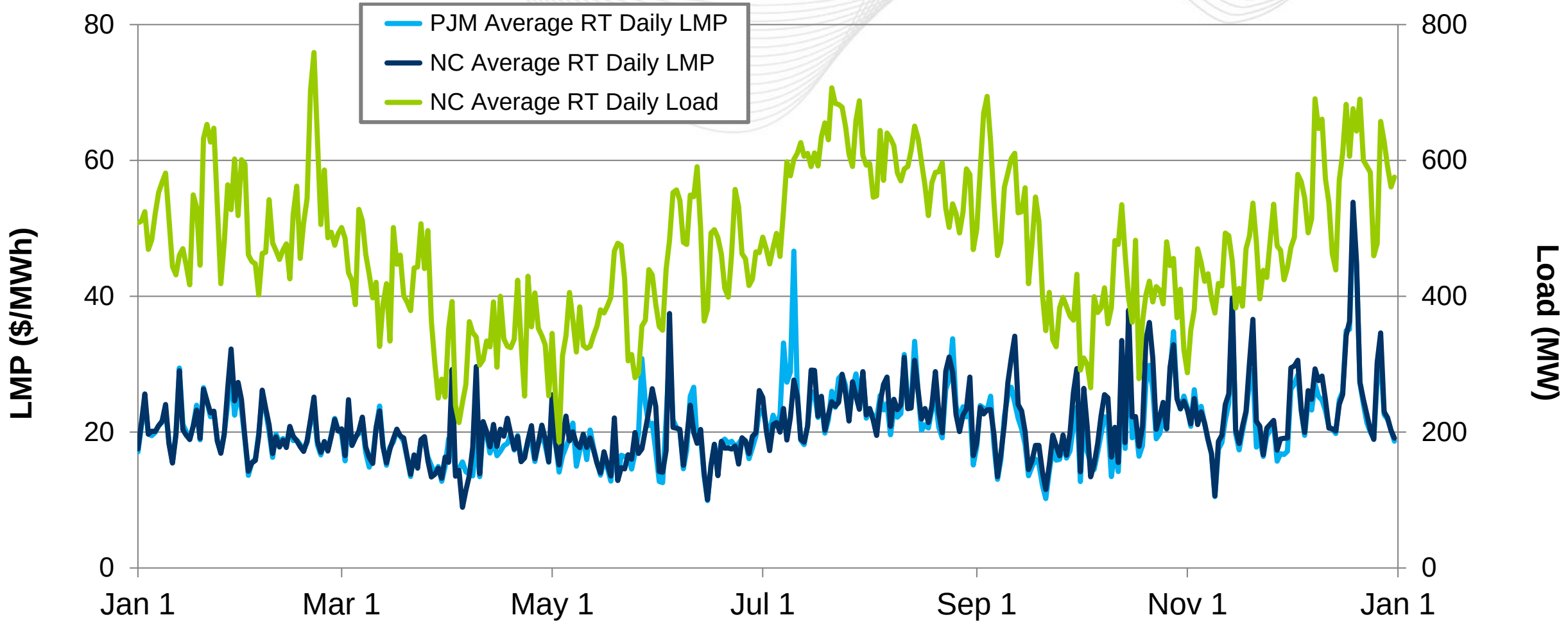
# North Carolina – Average Daily LMP and Load

(Jan. 1, 2020 – Dec. 31, 2020)





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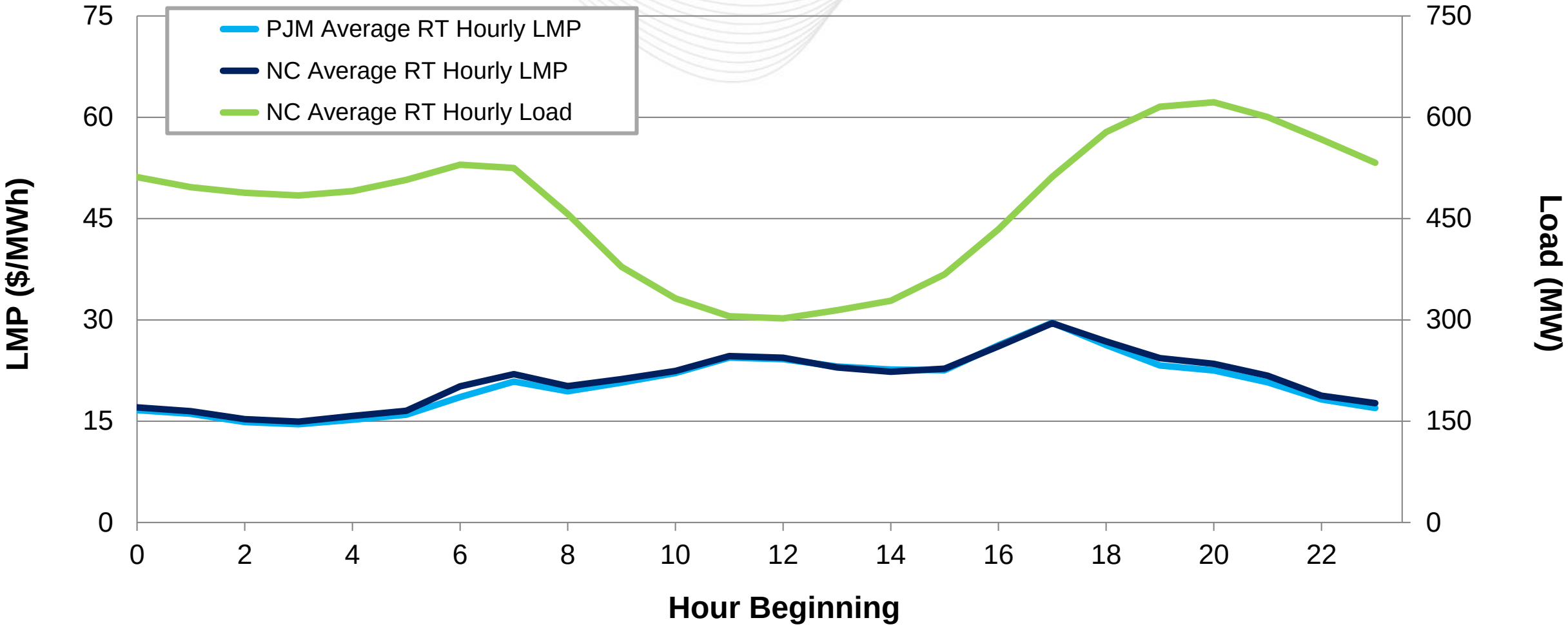
# North Carolina – Average Hourly LMP and Load

(Jan. 1, 2020 – Dec. 31, 2020)

North Carolina's average hourly LMPs aligned with the PJM average hourly LMP.



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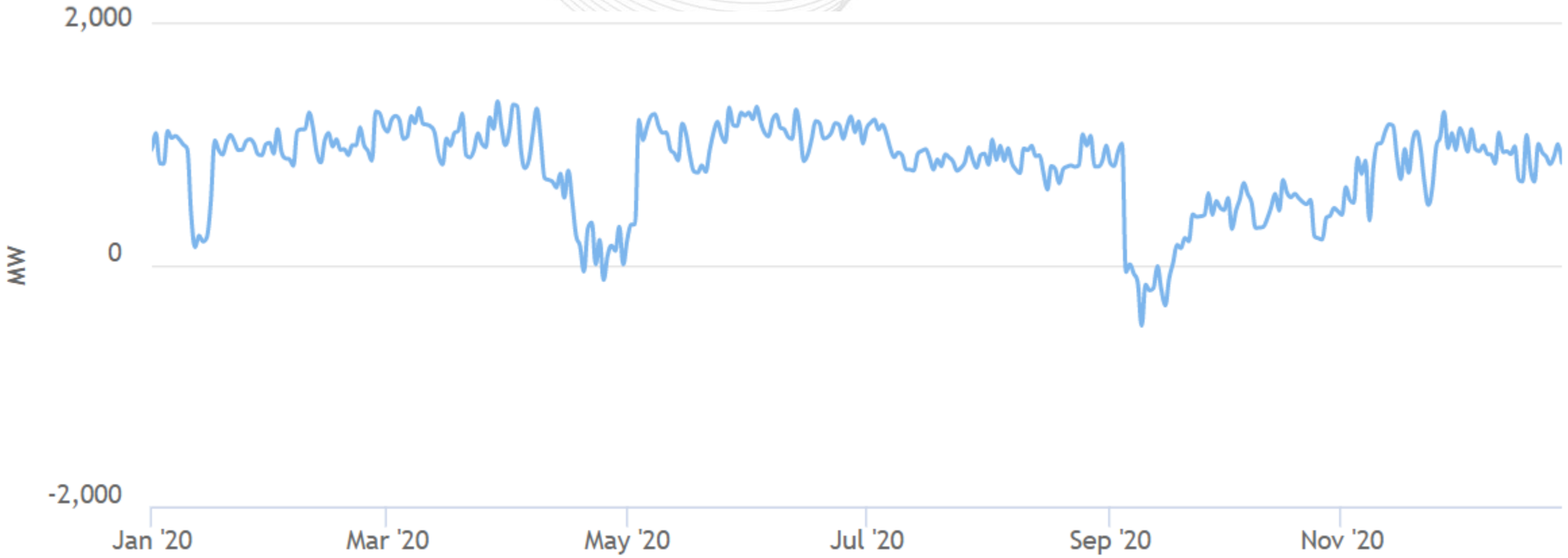
# North Carolina – Net Energy Import/Export Trend

(Jan. 2020 – Dec. 2020)




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



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# Operations
Emissions Data


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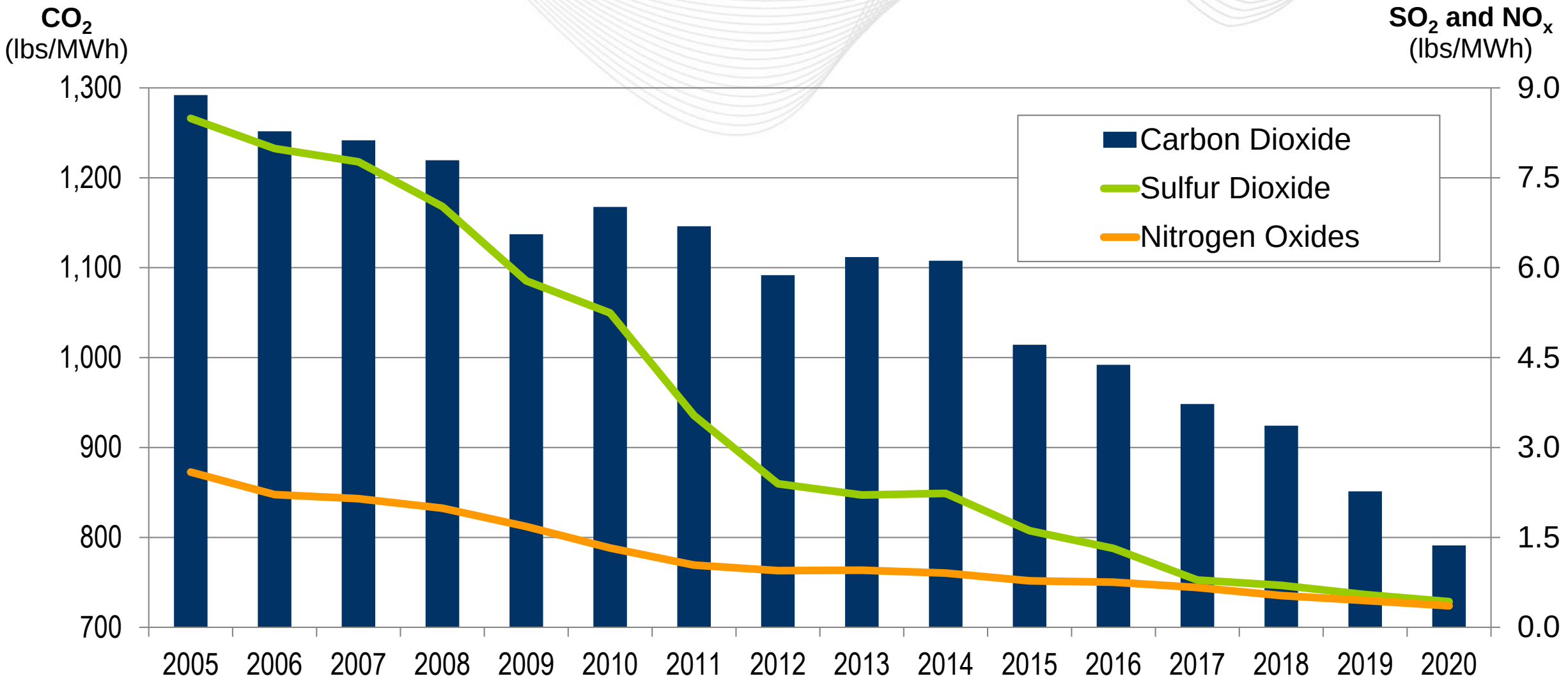
# 2005 – 2020 PJM Average Emissions





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