



Data Center Planning & Need Assessment Update

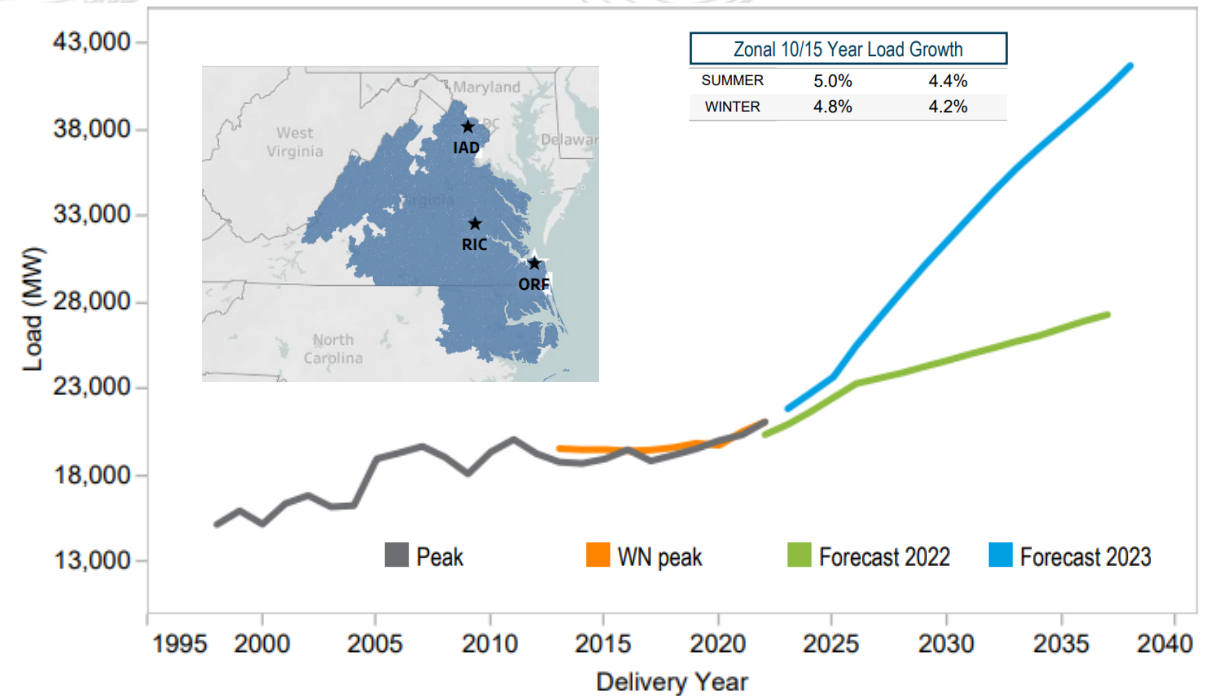
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Transmission Expansion Advisory Committee
January 10, 2023

- Data Center Load Growth - Background
- Forecast Updates
 - 2023 Load Forecast
 - Base Case Development
 - Case Zonal Load Overview
- Power Flow Profile into and around Data Center Loads
 - 2027 Summer High Load Growth
 - Reactive Interface Impact on Baseline Case
- Summary of Need
- Next Steps

- Earlier in 2022, PJM shared its forecast for 2022 and indicated high Data Center Load growth activity, particularly in Northern VA.
- In July 2022, PJM directed an Immediate Need transmission enhancement project to enable the integration of the forecasted load within the Dominion Data Center Alley up to and including year 2025.
- Since then, Data Center Loads within Northern Virginia have been increasing at an unprecedented rate.
- Currently, the recorded actual Summer Peak in 2022 was 21,156 MWs while the 2022 Forecast called for 20,424 MWs.
- PJM continued its consultation efforts with Transmission and Distribution owners in the area to refine its forecast and further enhance its need assessment.

- PJM has begun receiving near and long term forecast input from Dominion, First Energy and NOVEC for Data Center load growth projections up to and including 2038 (15 year planning horizon).
- The PJM 2023 Forecast calls for approximately between 5% to 4.2% annual load growth in the Dominion area over the next 10-15 year timeframe.
- The Load Forecast information was refined and developed down to a bus/substation level for the 2028 and 2030 study years.
- PJM reassessed the transmission Development Needs in the area based on the refined forecast information and localized allocation of load.



<https://pjm.com/-/media/library/reports-notices/load-forecast/2022-load-report.ashx>

Initially, PJM developed and studied two load scenarios: Baseline and High-Growth. The latest revision of PJM 2023 load forecast trends closely towards the high-load growth scenario.



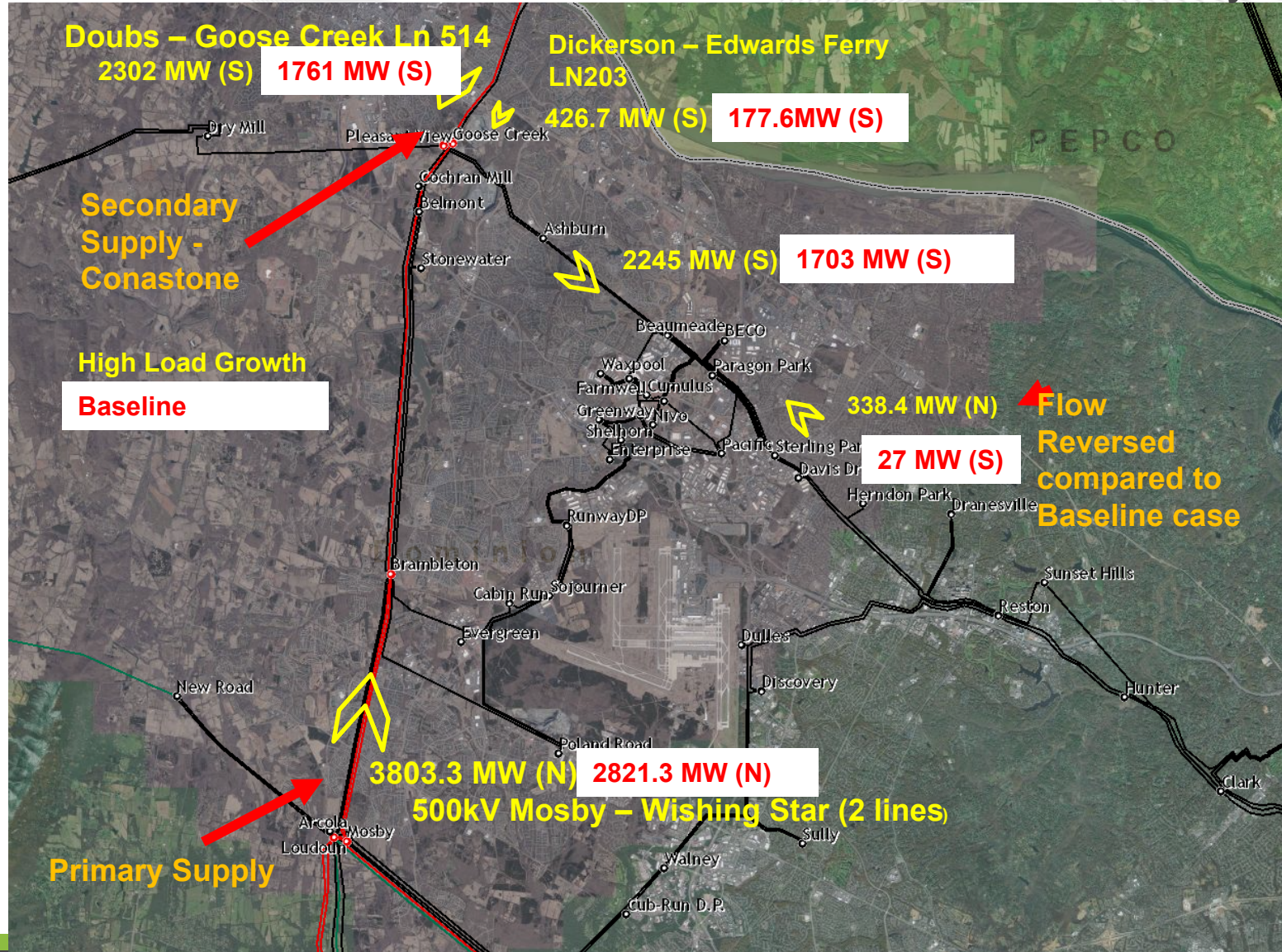
2027/28 Case Zonal Load Overview

Dominion/NOVEC	Zonal Load (MW) - SUM
2022 peak	20,424(forecast)/21,156(actual)
2027 RTEP	23,681
2027 Baseline	26,393
2027 High Load Growth	28,893
2028 RTEP (2023 Load Forecast)	28,705

First Energy (APS)	Zonal Load (MW) - SUM
2022 peak	8,675(forecast)/8,412(actual)
2027 RTEP	8,780
2027 Baseline	9,607
2027 High Load Growth	10,559
2028 RTEP (2023 Load Forecast)	9,568

- Based on 2027 RTEP case with the following included:
 - 2027 Dominion immediate need solution (b3718)
 - 33 supplemental projects from Dominion from Jan to Sept 2022
 - Bus level data center load additions
 - Some loads are allocated to “nearest” bus (focus on regional driven needs)
 - Summer, Winter and Light Load (LL) cases developed for Baseline and High Load Growth (HLG) scenarios

Power Flows around Data Center Alley – 2027 Summer



- The Data Center Load Growth rate (currently concentrating in areas of Northern Virginia) continues to increase.
- FirstEnergy's APS zone (just north of Virginia) is also experiencing Data Center load development.
- This concentrated load growth is driving high flows:
 - Within the Northern Virginia Dominion Transmission System
 - Into the Data Center concentrated load pocket (Regional Flows) from
 - West and East towards Doubs-Goose Creek
 - South into and out of Bristers towards Loudon
- Major voltage support needs within Dominion and APS will be required.
 - Some of the voltage violations are observed under N-0 conditions (fictitious VARs required to solve the case).
 - Heavy Regional transfers will require reinforcement to support the regional transfers.

- PJM is currently wrapping up its need assessment to address the Data Center Load growth in and around Northern Virginia Transmission network.
- PJM is working towards opening a competitive window in early February 2023 to address the identified violations.

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Data Center Load Planning



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Version No.	Date	Description
1	Jan 6 th 2023	<ul style="list-style-type: none">• Original slides posted
2	Jan 9 th 2023	<ul style="list-style-type: none">• Minor grammatical edits

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