2022 Virginia Infrastructure Report
(January 1, 2022 – December 31, 2022)

May 2023

This report reflects information for the portion of Virginia within the PJM service territory.
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• **Existing Capacity:** Natural gas represents approximately 49.1 percent of the total installed capacity in the Virginia service territory while hydro represents approximately 14.9 percent and nuclear 13.3 percent. In PJM natural gas and coal are 46.6 and 24.0 percent of total installed capacity, and nuclear represents 17.7 percent.

• **Interconnection Requests:** Solar represents 59.4 percent of new interconnection requests in Virginia, while storage represents approximately 29.7 percent of new requests.

• **Deactivations:** 767.1 MW of generation in Virginia gave a notice of deactivation in 2022.

• **RTEP 2022:** Virginia's 2022 RTEP project total represents approximately $1.35 billion in investment.
• **Load Forecast:** Virginia’s peak load growth is projected to range between -0.5 and 5.2 percent annually over the next ten years, depending on the service territory. The overall PJM RTO projected summer load growth rate is 0.8 percent.

• **2023/24 Capacity Market:** The portion of Virginia within the PJM footprint cleared at the RTO price of $34.13/MW-day in the 2023/2024 Base Residual Auction.

• **2024/25 Capacity Market:** The portion of Virginia within the PJM footprint cleared at the RTO price of $28.92/MW-day in the 2024/2025 Base Residual Auction.

• **1/1/22 – 12/31/22 Market Performance:** Virginia’s average hourly LMPs were above the PJM average hourly LMP.

• **Emissions:** Virginia’s average CO2 emissions remained steady in 2022 compared to 2021 levels
PJM Service Area – Virginia
Planning
Generation Portfolio Analysis
PJM – Existing Installed Capacity
(CIRs – as of Dec. 31, 2022)

- PJM 184,833 MW
- Natural Gas, 86,212 MW
- Coal, 44,293 MW
- Wind, 3,508 MW
- Hydro, 8,238 MW
- Solar, 2,707 MW
- Oil, 6,424 MW
- Nuclear, 32,649 MW
- Waste, 802 MW
Virginia – Existing Installed Capacity
(CIRs – as of Dec. 31, 2022)

- Waste: 317 MW
- Nuclear: 3,576 MW
- Oil: 1,397 MW
- Hydro: 4,011 MW
- Solar: 1,399 MW
- Wind: 2 MW
- Coal: 2,969 MW

Total: 26,847 MW

Natural Gas: 13,176 MW
PJM Queued Capacity (Nameplate) by Fuel Type
(“Active” in the PJM Queue as of April 1, 2023)

- Storage, 55,037 MW
- Solar, 147,986 MW
- Wind*, 43,221 MW
- Natural Gas, 5,537 MW
- Hydro, 824 MW
- Other, 60 MW

*Wind includes both onshore and offshore wind
Virginia Queued Capacity (Nameplate) by Fuel Type
(“Active” in the PJM Queue as of April 1, 2023)

- **Solar, 35,831 MW**
- **Storage, 17,882 MW**
- **Wind, 5,284 MW**
- **Natural Gas, 1,270 MW**
- **Other, 6 MW**

VA 60,273 MW
# Virginia – 2022 Generator Deactivations

<table>
<thead>
<tr>
<th>Unit</th>
<th>TO Zone</th>
<th>Fuel Type</th>
<th>Request Received to Deactivate</th>
<th>Actual or Projected Deactivation Date</th>
<th>Age (Years)</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorktown 3</td>
<td>Dominion</td>
<td>Oil</td>
<td>12/20/2022</td>
<td>5/31/2023</td>
<td>48</td>
<td>767.1</td>
</tr>
</tbody>
</table>
Planning
Transmission Infrastructure Analysis
For reporting purposes, the 2022 state infrastructure reports provide maps displaying all baseline, network, and supplemental projects for the respective state. The reports also include aggregated project cost tables of these projects by Transmission Owner zone. For a detailed list of each project shown on a state’s project map, please see that state’s section in the 2022 Annual RTEP Report on pjm.com: https://www.pjm.com/-/media/library/reports-notices/2022-rtep/2022-rtep-report.ashx

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
Note: Baseline upgrades are those that resolve a system reliability criteria violation.
Virginia – RTEP Network Projects

Note: Network projects 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.
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.
Planning
Load Forecast
The summer and winter peak megawatt values reflect the estimated amount of forecast 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.
Markets
Capacity Market Results
2023/24 Base Residual Auction Clearing Prices ($/MW-Day)

- **RTO**: $34.13
- **MAAC**: $49.49
- **BGE**: $69.95
- **DPL-South**: $69.95
## 2023/24 Cleared MW (UCAP) by Resource Type

<table>
<thead>
<tr>
<th></th>
<th>ANNUAL</th>
<th>SUMMER</th>
<th>WINTER</th>
<th>Total (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generation</strong></td>
<td>131,256.3</td>
<td>47.0</td>
<td>474.1</td>
<td>131,777.4</td>
</tr>
<tr>
<td><strong>DR</strong></td>
<td>7,919.1</td>
<td>177.1</td>
<td>0.0</td>
<td>8,096.2</td>
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<tr>
<td><strong>EE</strong></td>
<td>5,221.1</td>
<td>250.0</td>
<td>0.0</td>
<td>5,471.1</td>
</tr>
<tr>
<td><strong>Total (MW)</strong></td>
<td>144,396.5</td>
<td>474.1</td>
<td>474.1</td>
<td>131,777.4</td>
</tr>
</tbody>
</table>
2024/25 Base Residual Auction Clearing Prices ($/MW-Day)

- **MAAC**: $49.49
- **Eastern MAAC**: $54.95
- **DPL-South**: $90.64
- **DEO&K**: $96.24
- **RTO**: $28.92
- **BGE**: $73.00
## 2024/2025 Cleared MW (UCAP) by Resource Type

<table>
<thead>
<tr>
<th></th>
<th>ANNUAL</th>
<th>SUMMER</th>
<th>WINTER</th>
<th>Total (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generation</strong></td>
<td>131,779.3</td>
<td>38.2</td>
<td>605.6</td>
<td>132,423.1</td>
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<tr>
<td><strong>DR</strong></td>
<td>7,804.3</td>
<td>188.4</td>
<td>0</td>
<td>7,992.7</td>
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<tr>
<td><strong>EE</strong></td>
<td>7,289.7</td>
<td>379.0</td>
<td>0</td>
<td>7,668.7</td>
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<tr>
<td><strong>Total (MW)</strong></td>
<td>146,873.3</td>
<td>605.6</td>
<td>605.6</td>
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Markets
Market Analysis
Note: The significant price spike in late Dec. 2022 was a result of Winter Storm Elliott’s impact on system conditions.
Virginia’s average hourly LMPs were above the PJM average hourly LMP.
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.
Operations
Virginia – 2022 Generator Production

- Natural Gas, 53.7%
- Nuclear, 32.8%
- Other, 5.4%
- Solar, 4.2%
- Wind, 0.1%
- Coal, 3.9%

The data in this chart comes from EIA Form 923 (2022).
Virginia – Average Emissions (lbs/MWh)

(Feb. 2023)

<table>
<thead>
<tr>
<th>Year</th>
<th>CO₂ (lbs/MWh)</th>
<th>SO₂ and NOₓ (lbs/MWh)</th>
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<tbody>
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<td>1,400</td>
<td>8</td>
</tr>
<tr>
<td>2006</td>
<td>1,300</td>
<td>7</td>
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<tr>
<td>2022</td>
<td>0</td>
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Carbon Dioxide
Nitrogen Oxides
Sulfur Dioxide