2019 Maryland and District of Columbia State Infrastructure Report
(January 1, 2019 – December 31, 2019)

May 2020
1. Planning
   • Generation Portfolio Analysis
   • Transmission Analysis
   • Load Forecast

2. Markets
   • Market Analysis

3. Operations
   • Emissions Data
Existing Capacity: Natural gas represents approximately 40.7 percent of the total installed capacity in the Maryland service territory while coal represents approximately 31 percent. Comparatively, across PJM natural gas and coal are at 42.4 and 28.7 percent of total installed capacity.

Interconnection Requests: Natural gas represents 52.8 percent of new interconnection requests in Maryland, while solar represents approximately 38.5 percent of new requests.

Deactivations: 122 MW in Maryland gave notification of deactivation in 2019.

RTEP 2019: Maryland’s 2019 RTEP projects total approximately $162.5 million in investment. Approximately 90 percent of that represents supplemental projects. These investment figures only represent RTEP projects that cost at least $5 million.
• **Load Forecast:** Maryland and Washington, D.C. load growth is relatively flat, averaging between -0.1 and 0.7 percent annually over the next 10 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 2019. For the most recent auction results, please see the 2018 Maryland and DC State Infrastructure Report.

• **1/1/19 – 12/31/19 Market Performance:** Maryland and DC’s average hourly LMPs were higher than PJM average hourly LMPs.

• **Emissions:** 2019 carbon dioxide, sulfur dioxide, and nitrogen oxide emissions in Maryland decreased from 2018 levels.
PJM Service Area – Maryland and D.C.
Planning
Generation Portfolio Analysis
PJM – Existing Installed Capacity
(CIRs – as of Dec. 31, 2019)

- Natural Gas, 78,047 MW
- Coal, 52,838 MW
- Wind, 1,239 MW
- Nuclear, 32,653 MW
- Waste, 849 MW
- Oil, 9,424 MW
- Solar, 791 MW
- Hydro, 8,332 MW
Maryland – Existing Installed Capacity
(Washington, D.C. does not have any installed capacity; CIRs – as of Dec. 31, 2019)

Wind, 29 MW
Coal, 4,309 MW
Solar, 59 MW
Oil, 1,444 MW
Nuclear, 1,708 MW
Waste, 102 MW

MD/DC
13,908 MW

Hydro, 592 MW
Natural Gas, 5,665 MW
PJM – Queued Capacity (MW) by Fuel Type
(Requested CIRs – as of Dec. 31, 2019)

- Solar, 35,759 MW
- Other, 40 MW
- Nuclear, 169 MW
- Oil, 27 MW
- Natural Gas, 34,990 MW
- Storage, 3,920 MW
- Wind, 6,240 MW
- Wood, 66 MW
- Coal, 96 MW
- Diesel, 4 MW
- Methane, 1 MW
- Hydro, 520 MW
Maryland – Queued Capacity (MW) by Fuel Type  
(Requested CIRs – as of Dec. 31, 2019)

- **Solar**: 888 MW  
  Nameplate Capacity: 1,923 MW
- **Natural Gas**: 1,216 MW
- **Oil**: 14 MW
- **Nuclear**: 37 MW
- **Storage**: 117 MW  
  Nameplate Capacity: 129 MW
- **Wind**: 17 MW  
  Nameplate Capacity: 15 MW
- **Hydro**: 15 MW  
  Nameplate Capacity: 15 MW

**Note**: Nameplate Capacity represents a generator’s rated full power output capability.
Maryland / D.C. – Percentage of MW in Queue by Fuel Type
(Dec. 31, 2019)
<table>
<thead>
<tr>
<th>Non-Renewable</th>
<th>Renewable</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In Queue</strong></td>
<td><strong>In Service</strong></td>
<td><strong>Withdrawn</strong></td>
</tr>
<tr>
<td><strong>Active</strong></td>
<td><strong>Suspends</strong></td>
<td><strong>Under Construction</strong></td>
</tr>
<tr>
<td>No. of Projects</td>
<td>Capacity (MW)</td>
<td>No. of Projects</td>
</tr>
<tr>
<td>Coal</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diesel</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>1</td>
<td>144.6</td>
</tr>
<tr>
<td>Nuclear</td>
<td>3</td>
<td>37.4</td>
</tr>
<tr>
<td>Oil</td>
<td>1</td>
<td>14.0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Storage</td>
<td>5</td>
<td>117.2</td>
</tr>
<tr>
<td>Biomass</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hydro</td>
<td>1</td>
<td>15.0</td>
</tr>
<tr>
<td>Methane</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Solar</td>
<td>38</td>
<td>663.9</td>
</tr>
<tr>
<td>Wind</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>992.1</strong></td>
<td><strong>1,045.9</strong></td>
</tr>
</tbody>
</table>

**Note:** The "Under Construction" column includes both “Engineering and Procurement” and “Under Construction” project statuses.
Maryland – Progression History of Interconnection Requests

Applications Received by PJM

Projects withdrawn after final agreement

<table>
<thead>
<tr>
<th>Projects withdrawn after final agreement</th>
<th>Nameplate Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interconnection Service Agreements</td>
<td>4,657 MW</td>
</tr>
<tr>
<td>Wholesale Market Participation Agreements</td>
<td>73 MW</td>
</tr>
</tbody>
</table>

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.
Maryland – Generation Deactivation Notifications Received in 2019

Legend
Deactivation Notices 2019
- 0 - 49 MW
- 50 - 149 MW
- 150 - 324 MW
- 325 - 1199 MW
- 1200 - 2490 MW
- Substations >= 345 kV
- Transmission Lines >= 345 kV
## Maryland – Generation Deactivation Notifications Received in 2019

<table>
<thead>
<tr>
<th>Unit</th>
<th>TO Zone</th>
<th>Fuel Type</th>
<th>Projected/Actual Deactivation Date</th>
<th>Withdrawn Deactivation Date</th>
<th>Age (Years)</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gould Street Generation Station</td>
<td>BGE</td>
<td>Natural Gas</td>
<td>6/1/2019</td>
<td></td>
<td>66</td>
<td>98</td>
</tr>
<tr>
<td>Riverside 8</td>
<td>BGE</td>
<td>Oil</td>
<td>12/1/2019</td>
<td></td>
<td>48</td>
<td>20</td>
</tr>
<tr>
<td>Eastern Land Fill</td>
<td>BGE</td>
<td>Other Gas</td>
<td>9/30/2019</td>
<td>9/26/2019</td>
<td>12</td>
<td>4</td>
</tr>
</tbody>
</table>
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.

Maryland – RTEP Baseline Projects
(No baseline projects were planned in Washington, D.C. in the 2019 RTEP; Greater than $10 million)

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

(No baseline projects were planned in Washington, D.C. in the 2019 RTEP; Greater than $5 million)

<table>
<thead>
<tr>
<th>Map ID</th>
<th>Project</th>
<th>Description</th>
<th>Projected In-Service Date</th>
<th>Project Cost ($M)</th>
<th>TO Zone</th>
<th>TEAC Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>b2970</td>
<td>Convert Garfield 138/12.5 kV substation to 230/12.5 kV.</td>
<td>6/1/2020</td>
<td>$15.5</td>
<td>APS</td>
<td>5/16/2019</td>
</tr>
</tbody>
</table>
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.

Maryland and Washington, D.C. had no network project upgrades in 2019.
Maryland – TO Supplemental Projects

(No supplemental projects were planned in Washington, D.C. in the 2019 RTEP; Greater than $10 million)

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.
Maryland – TO Supplemental Projects
(No supplemental projects were planned in Washington, D.C. in the 2019 RTEP; Greater than $5 million)

<table>
<thead>
<tr>
<th>Map ID</th>
<th>Project</th>
<th>Description</th>
<th>Projected In-Service Date</th>
<th>Project Cost ($M)</th>
<th>TO Zone</th>
<th>TEAC Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>s2025</td>
<td>Port Covington 115/13 kV Project. Build a new Port Covington 115/13 kV station. Expand existing Westport 115 kV station to accommodate new 115 kV underground circuits. Build two 115 kV underground transmission lines from Westport to Port Covington. Build two 115 kV underground transmission lines from Greene Street to Port Covington.</td>
<td>12/1/2026</td>
<td>$105.0</td>
<td>BGE</td>
<td>3/25/2019</td>
</tr>
<tr>
<td>2</td>
<td>s2073</td>
<td>Rebuild 69 kV line from Vienna-West Cambridge substations. All structures, conductor and static wire will be replaced with new steel poles, conductor and optical ground wire.</td>
<td>12/31/2022</td>
<td>$28.7</td>
<td>DP&amp;L</td>
<td>1/25/2019</td>
</tr>
<tr>
<td>3</td>
<td>s2080</td>
<td>Edgewood-Perryman 115 kV circuits 110620, 110621: Replace existing three lattice towers and conductor with seven new double circuit monopole towers and conductor.</td>
<td>12/31/2022</td>
<td>$13.3</td>
<td>BGE</td>
<td>11/18/2019</td>
</tr>
</tbody>
</table>
Planning
Load Forecast
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.

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
Maryland – Average Daily Load and LMP
(Jan. 1, 2019 – Dec. 31, 2019)

Note: The price spike in October reflects the Performance Assessment Interval event that occurred on October 2nd.
Maryland's average hourly LMPs were higher than the PJM average hourly LMP.
Positive values represent exports and negative values represent imports.
Washington, D.C. – Average Daily Load and LMP
(Jan. 1, 2019 – Dec. 31, 2019)

Note: The price spike in October reflects the Performance Assessment Interval event that occurred on October 2nd.
Washington, D.C.’s average hourly LMPs were higher than the PJM average hourly LMP.
Washington, D.C. – Net Energy Import/Export Trend
(May 2019 – April 2020)

Positive values represent exports and negative values represent imports.
Operations
Emissions Data
2005 – 2019 PJM Average Emissions

CO₂ (lbs/MWh)

SO₂ and NOₓ (lbs/MWh)

- Carbon Dioxide
- Nitrogen Oxides
- Sulfur Dioxides