2018 Tennessee State Infrastructure Report
(January 1, 2018 – December 31, 2018)

May 2019

This report reflects information for the portion of Tennessee within the PJM service territory.
1. Planning
   • Generation Portfolio Analysis
   • Transmission Analysis
   • Load Forecast

2. Markets
   • Capacity Market Results
   • Market Analysis

3. Operations
   • Emissions Data
• **Existing Capacity:** There are 45 MW of installed capacity in the part of Tennessee served by PJM.

• **Interconnection Requests:** There are no interconnection requests in Tennessee.

• **Deactivations:** Tennessee had no generation deactivations or deactivation notifications in 2018.

• **RTEP 2018:** Tennessee had no RTEP projects in 2018. There were also no supplemental projects in Tennessee in 2018.

• **Load Forecast:** Tennessee load growth is nearly flat, averaging between 0.4 and 0.5 percent per year over the next 10 years. This aligns with PJM RTO load growth projections.

• **1/1/18 – 12/31/18 Performance:** Except for the cold snap in early 2018, Tennessee’s average daily locational marginal prices remained consistent with PJM average daily LMPs. Imported resources represent 85.8 percent of the generation that serves the portion of Tennessee within the PJM footprint.
Planning
Generation Portfolio Analysis
PJM Existing Installed Capacity
(CIRs, December 31, 2018)

- Coal, 56,653 MW
- Natural Gas, 74,194 MW
- Nuclear, 33,362 MW
- Oil, 9,499 MW
- Waste, 865 MW
- Solar, 640 MW
- Hydro, 8,346 MW
- Wind, 1,165 MW
Tennessee – Existing Installed Capacity
(MW submitted to PJM, December 31, 2018)

Waste, 45 MW
## Tennessee – Interconnection Requests

(Unforced Capacity, As of December 31, 2017)

<table>
<thead>
<tr>
<th></th>
<th>Complete</th>
<th></th>
<th>Grand Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In Service</td>
<td>Withdrawn</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No. of Projects</td>
<td>Capacity, MW</td>
<td>No. of Projects</td>
<td>Capacity, MW</td>
</tr>
<tr>
<td>Non-Renewable</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>75</td>
</tr>
<tr>
<td>Coal</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>75</td>
</tr>
<tr>
<td>Renewable</td>
<td>2</td>
<td>90</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Biomass</td>
<td>2</td>
<td>90</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grand Total</td>
<td>2</td>
<td>90</td>
<td>1</td>
<td>75</td>
</tr>
</tbody>
</table>

There are no interconnection requests in the queue in the part of Tennessee served by PJM.
Tennessee – Progression History Interconnection Requests
Projects under construction, suspended, in service, or withdrawn (as of December 31, 2018)

- 165 MW
- 165 MW
- 165 MW
- 165 MW
- 90 MW
- 90 MW
- 90 MW

- Applications Received by PJM
- Feasibility Studies Issued
- Impact Studies Issued
- Facilities Studies Issued
- Construction of Facilities
- Executed ISA/WMPA
- In Service

- Percentage of planned capacity and projects reached commercial operation
  - 54.5 % requested capacity megawatt
  - 66.7 % requested projects

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Tennessee had no generation deactivations or deactivation notifications in 2018.
Planning
Transmission Infrastructure Analysis
Tennessee – RTEP Baseline Projects

(Greater than $5 million)

Tennessee had no baseline project upgrades in 2018.

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

(Greater than $5 million)

Tennessee had no network project upgrades in 2018.

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.
Tennessee– TO Supplemental Projects
(Greater than $5 million)

Tennessee had no supplemental project upgrades in 2018.

Note: Supplemental projects are transmission expansions or enhancements that are not required for compliance with the following PJM criteria: system reliability, operational performance or economic criteria, pursuant to a determination by the Office of the Interconnection and is not a state public policy project.
Planning
Load Forecast
PJM Annual Load Forecasts (January 2019)

PJM RTO Summer Peak Demand Forecast

Load Forecast
- 2013
- 2017
- 2014
- 2018
- 2015
- 2019
- 2016

Load (MW)

- 190,000
- 180,000
- 170,000
- 160,000
- 150,000
- 140,000
- 130,000

Year

2014 2016 2018 2020 2022 2024 2026 2028 2030 2032 2034
### Tennessee – 2019 Load Forecast Report

<table>
<thead>
<tr>
<th>Transmission Owner</th>
<th>Summer Peak (MW)</th>
<th>Winter Peak (MW)</th>
<th>Growth Rate (%)</th>
<th>2018/19</th>
<th>2028/29</th>
<th>Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Electric Power Company *</td>
<td>348</td>
<td>365</td>
<td>0.5%</td>
<td>443</td>
<td>463</td>
<td>0.4%</td>
</tr>
<tr>
<td>PJM RTO</td>
<td>151,358</td>
<td>156,689</td>
<td>0.3%</td>
<td>131,082</td>
<td>136,178</td>
<td>0.4%</td>
</tr>
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</table>

* PJM notes that American Electric Power Company serves load other than in Tennessee. The Summer Peak and Winter Peak MW values in this table each reflect the estimated amount of forecasted load to be served by American Electric Power Company solely in Tennessee. Estimated amounts were calculated based on the average share of American Electric Power Company’s real-time summer and winter peak load located in Tennessee over the past five years.
Markets
Capacity Market Results
2021/22 Base Residual Auction Clearing Prices ($/MW-Day)

ComEd: $196
ATSI: $171
PSE&G: $204
RTO: $140
EMAAC: $166
BGE: $200
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Annual</th>
<th>Summer</th>
<th>Winter</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation</td>
<td>149,616 MW</td>
<td>54 MW</td>
<td>716 MW</td>
<td>150,385 MW</td>
</tr>
<tr>
<td>DR</td>
<td>10,674 MW</td>
<td>452 MW</td>
<td>- MW</td>
<td>11,126 MW</td>
</tr>
<tr>
<td>EE</td>
<td>2,623 MW</td>
<td>209 MW</td>
<td>- MW</td>
<td>2,832 MW</td>
</tr>
<tr>
<td>Total</td>
<td>162,912 MW</td>
<td>716 MW</td>
<td>716 MW</td>
<td>164,343 MW</td>
</tr>
</tbody>
</table>
Markets
Market Analysis
Tennessee – Average Daily LMP and Load
(January 1, 2018 – December 31, 2018)

Tennessee’s average daily LMPs generally aligned with the PJM average daily LMP

Note: The price spike in January reflects the Cold Snap that lasted from 12/28/17 to 1/7/2018.
Tennessee’s average hourly LMPs were lower than the PJM average during peak hours.
Tennessee – Energy Production
(January 1, 2018 – December 31, 2018)

Amount of energy produced by Tennessee generation within the PJM service territory in 2018.

Note: Approximately 2 million megawatt hours of energy, including imports, served the portion of Tennessee within the PJM footprint.
Operations
Emissions Data
2005-2018 PJM Average Emissions

- **CO₂**: lbs/MWh
- **SO₂ and NOₓ**: lbs/MWh

- **Carbon Dioxide**
- **Sulfur Dioxides**
- **Nitrogen Oxides**
Please note that PJM has 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 still included in this state report. Going forward, the inclusion of RTEP projects in the State Infrastructure reports will be consistent with the RTEP listing cutoff of $10 million.

For a complete list of all RTEP projects, including those below the RTEP threshold of $10 million, please visit the “RTEP Upgrades & Status – Transmission Construction Status” page on pjm.com.