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

May 2019
(updated June 2019)

This report reflects information for the portion of Illinois 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:** Natural gas represents 41.7 percent of the total installed capacity in Illinois with nuclear a close second at 40.6 percent. Coal only represents 14.8 percent of total installed capacity in Illinois. This differs from PJM where natural gas and coal are at 40.2 and 30.7 percent of total installed capacity.

• **Interconnection Requests:** Natural gas represents approximately 71.9 percent of new interconnection requests in Illinois.

• **Deactivations:** 304 MW of capacity within the Illinois territory gave a notice of deactivation in 2018.

• **RTEP 2018:** Illinois RTEP 2018 projects total over $159 million in investment. Approximately 48.5 percent of that represents supplemental projects. These investment figures only represent RTEP projects that cost at least $5 million.

• **Load Forecast:** Illinois load growth is nearly flat, averaging between 0.2 and 0.3 percent per year over the next 10 years. This aligns with PJM RTO load growth projections.
• **2021/22 Capacity Market**: Illinois cleared 554 MW more Demand Response and Energy Efficiency resources than in the prior auction.

• **1/1/18 – 12/31/18 Market Performance**: Illinois’ hourly average locational marginal prices were below PJM’s hourly average LMPs. Nuclear resources represented 67.7 percent of generation produced in Illinois while coal represented 15.8 percent. Illinois exported 25.4 percent of the generation produced within the state.

• **Emissions**: 2018 carbon dioxide and nitrogen oxide emissions were slightly up from 2017; sulfur dioxide emissions remained flat in 2018.
The PJM service area in Illinois is the ComEd zone and is represented by the shaded portion of the map.

PJM operates transmission lines that extend beyond the service territory.
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
- Waste, 865 MW
- Oil, 9,499 MW
- Solar, 640 MW
- Hydro, 8,346 MW
- Wind, 1,165 MW
Summary:

Natural gas represents approximately 41.7 percent of the total installed capacity in the Illinois territory while coal represents approximately 14.8 percent.

Overall in PJM, natural gas represents approximately 40.2 percent of installed capacity while coal represents 30.7 percent.
Natural gas represents approximately 71.9 percent of new interconnection requests in Illinois.
Based on known queued interconnection requests and deactivation notices through December 31, 2022, adjusted to reflect the probability of commercialization as indicated by historical trends specific to an interconnection request's state/zonal location and fuel type.

**Illinois – Future Capacity Mix**

- Solar, 27.8 MW
- Hydro, 22.7 MW
- Wind, 744.3 MW
- Coal, 3838.4 MW
- Nuclear, 10517.4 MW
- Gas, 11328.4 MW
- Oil, 272.1 MW
- Solar, 27.8 MW
- Hydro, 22.7 MW
- Wind, 744.3 MW
- Coal, 3838.4 MW
- Nuclear, 10517.4 MW
- Gas, 11328.4 MW
- Oil, 272.1 MW
Illinois – Progression History Interconnection Requests
Projects under construction, suspended, in service, or withdrawn (as of December 31, 2018)

- **Projects withdrawn after final agreement**
  - 7 Interconnection Service Agreements – 275.6 MW < Nameplate Capacity, 1,178 MW
  - 4 Wholesale Market Participation Agreements – 3.8 MW < Nameplate Capacity, 14.7 MW

- **Percentage of planned capacity and projects reached commercial operation**
  - 16 % requested capacity megawatt
  - 25.7 % requested projects
Illinois – Actual Generation Deactivations and Deactivation Notifications Received in 2018
Illinois – Actual Generation Deactivations and Deactivation Notifications Received in 2018

<table>
<thead>
<tr>
<th>Unit</th>
<th>Capacity (MW)</th>
<th>TO Zone</th>
<th>Age (Years)</th>
<th>Projected/Actual Deactivation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southeast Chicago 5</td>
<td>38</td>
<td>ComEd</td>
<td>16</td>
<td>6/1/2020</td>
</tr>
<tr>
<td>Southeast Chicago 6</td>
<td>38</td>
<td>ComEd</td>
<td>16</td>
<td>6/1/2020</td>
</tr>
<tr>
<td>Southeast Chicago 7</td>
<td>38</td>
<td>ComEd</td>
<td>16</td>
<td>6/1/2020</td>
</tr>
<tr>
<td>Southeast Chicago 8</td>
<td>38</td>
<td>ComEd</td>
<td>16</td>
<td>6/1/2020</td>
</tr>
<tr>
<td>Southeast Chicago 9</td>
<td>38</td>
<td>ComEd</td>
<td>16</td>
<td>6/1/2020</td>
</tr>
<tr>
<td>Southeast Chicago 10</td>
<td>38</td>
<td>ComEd</td>
<td>16</td>
<td>6/1/2020</td>
</tr>
<tr>
<td>Southeast Chicago 11</td>
<td>38</td>
<td>ComEd</td>
<td>16</td>
<td>6/1/2020</td>
</tr>
<tr>
<td>Southeast Chicago 12</td>
<td>38</td>
<td>ComEd</td>
<td>16</td>
<td>6/1/2020</td>
</tr>
<tr>
<td>Morris Landfill</td>
<td>2</td>
<td>ComEd</td>
<td>17</td>
<td>5/31/2018</td>
</tr>
</tbody>
</table>
Planning
Transmission Infrastructure Analysis
Illinois – RTEP Baseline Projects
(Greater than $10 million)

Note: Baseline upgrades are those that resolve a system reliability criteria violation.
<table>
<thead>
<tr>
<th>Map ID</th>
<th>Project</th>
<th>Sub ID</th>
<th>Description</th>
<th>Required In-Service Date</th>
<th>Project Cost ($M)</th>
<th>TO Zone</th>
<th>2018 TEAC Review</th>
<th>Baseline Load Growth Deliverability and Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>b2999</td>
<td></td>
<td>Rebuild 12.36 miles of Schauff Road-Nelson Tap 138 kV line.</td>
<td>11/1/2019</td>
<td>$17</td>
<td>ComEd</td>
<td>5/21/2018</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>b2998</td>
<td></td>
<td>Install a 120 Mvar 345 kV shunt inductor at Powerton.</td>
<td>6/1/2021</td>
<td>$9</td>
<td>ComEd</td>
<td>5/3/2018</td>
<td>X</td>
</tr>
</tbody>
</table>
Illinois – RTEP Network Projects
(Greater than $10 million)

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.
### Illinois – RTEP Network Projects
(Greater than $5 million)

<table>
<thead>
<tr>
<th>Map ID</th>
<th>Project</th>
<th>Description</th>
<th>Project Driver</th>
<th>Queue</th>
<th>Required In-Service Date</th>
<th>Project Cost ($M)</th>
<th>TO Zone</th>
<th>2018 TEAC Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>n5915</td>
<td>Reconductor the Elwood-Goodings Grove 345 kV line, upgrade the station conductor at both line terminals, and upgrade the line circuit breaker at Goodings Grove.</td>
<td>Generation</td>
<td>AC1-204 (Natural Gas)</td>
<td>6/1/2022</td>
<td>$23</td>
<td>ComEd</td>
<td>9/13/2018</td>
</tr>
<tr>
<td>2</td>
<td>n5916</td>
<td>Reconductor the Elwood-Goodings Grove 345 kV line, upgrade the station conductor at both line terminals, and upgrade the line circuit breaker at Goodings Grove.</td>
<td>Generation</td>
<td>AC1-204 (Natural Gas)</td>
<td>6/1/2022</td>
<td>$23</td>
<td>ComEd</td>
<td>9/13/2018</td>
</tr>
<tr>
<td>3</td>
<td>n5917</td>
<td>Reconductor the E. Frankfort-Crete 345 kV line.</td>
<td>Generation</td>
<td>AC1-204 (Natural Gas)</td>
<td>6/1/2022</td>
<td>$10</td>
<td>ComEd</td>
<td>9/13/2018</td>
</tr>
</tbody>
</table>
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.
## Illinois – TO Supplemental Projects
(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>2018 TEAC Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>s1480</td>
<td>Install a new 138/34 kV transformer with high-side and low-side breakers at Lena. Expand the 34 kV switchgear. Replace line circuit switchers with 138 kV breakers, install new bus tie breaker. Normally close 138 kV line into Lena. Normally open the new 138 kV bus tie breaker.</td>
<td>6/1/2019</td>
<td>$14.2</td>
<td>ComEd</td>
<td>1/8/2018</td>
</tr>
<tr>
<td>2</td>
<td>s1529</td>
<td>Install a 345 kV bus tie and breaker at Lisle 345 kV substation. Close the new and existing bus ties creating a large hybrid ring bus so each bus contains a transmission line and a transformers. Install four 345 kV line breakers and two 345 kV high-side transformer breakers.</td>
<td>12/31/2019</td>
<td>$30</td>
<td>ComEd</td>
<td>2/8/2018</td>
</tr>
<tr>
<td>3</td>
<td>s1530</td>
<td>Replace Wayne 345/138 kV transformer. Finish ring bus on 345 kV bus. Install two 345 kV breakers. Retire existing cap bank and install 138 kV cap bank.</td>
<td>12/31/2019</td>
<td>$15</td>
<td>ComEd</td>
<td>2/8/2018</td>
</tr>
<tr>
<td>4</td>
<td>s1533</td>
<td>Construct new line from the Twombley Road substation to a tap of the West DeKalb-Glidden 138 kV line just outside the West DeKalb 138 kV substation. ComEd work at West DeKalb to accommodate the connection.</td>
<td>10/1/2021</td>
<td>$18</td>
<td>City of Rochelle</td>
<td>3/9/2018</td>
</tr>
</tbody>
</table>
Illinois - Merchant Transmission Project Requests
# Illinois - Merchant Transmission Project Requests

<table>
<thead>
<tr>
<th>Queue</th>
<th>Project Name</th>
<th>Maximum Fuel Output (MW)</th>
<th>Status</th>
<th>Projected In-Service Date</th>
<th>TO Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC1-223</td>
<td>E. Frankfort-University Park North</td>
<td>43.2</td>
<td>Under Construction</td>
<td>6/1/2020</td>
<td>ComEd</td>
</tr>
<tr>
<td>AD1-086</td>
<td>E. Frankfort-Goodings Grove</td>
<td>23.9</td>
<td>Active</td>
<td>6/20/2021</td>
<td>ComEd</td>
</tr>
<tr>
<td>AE1-184</td>
<td>Pontiac Midpoint-Dresden</td>
<td>82.7</td>
<td>Active</td>
<td>6/1/2022</td>
<td>ComEd</td>
</tr>
</tbody>
</table>
Planning
Load Forecast
PJM Annual Load Forecasts
(January 2019)

PJM RTO Summer Peak Demand Forecast

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

Load (MW)
190,000
180,000
170,000
160,000
150,000
140,000
130,000

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

<table>
<thead>
<tr>
<th>Transmission Owner</th>
<th>Summer Peak (MW)</th>
<th>Winter Peak (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2019</td>
<td>2029</td>
</tr>
<tr>
<td>Commonwealth Edison Company</td>
<td>21,890</td>
<td>22,514</td>
</tr>
<tr>
<td>PJM RTO</td>
<td>151,358</td>
<td>156,689</td>
</tr>
</tbody>
</table>

* PJM notes that it does not serve the entire state of Illinois.
Markets
Capacity Market Results
2021/22 Base Residual Auction Clearing Prices ($/MW-Day)
Illinois – Cleared Resources in 2021/22 Auction

(May 23, 2018)

<table>
<thead>
<tr>
<th>Cleared MW (Unforced Capacity)</th>
<th>Change from 2020/21 Auction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation</td>
<td>19,864</td>
</tr>
<tr>
<td>Demand Response</td>
<td>1,998</td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td>771</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22,633</strong></td>
</tr>
</tbody>
</table>

ComEd Locational Clearing Prices

Clearing Price: $196
## PJM – 2021/2022 Cleared MW (UCAP) by Resource Type

<table>
<thead>
<tr>
<th></th>
<th>Annual</th>
<th>Summer</th>
<th>Winter</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>149,616 MW</td>
<td>54 MW</td>
<td>716 MW</td>
<td>150,385 MW</td>
</tr>
<tr>
<td><strong>DR</strong></td>
<td>10,674 MW</td>
<td>452 MW</td>
<td>- MW</td>
<td>11,126 MW</td>
</tr>
<tr>
<td><strong>EE</strong></td>
<td>2,623 MW</td>
<td>209 MW</td>
<td>- MW</td>
<td>2,832 MW</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>162,912 MW</td>
<td>716 MW</td>
<td>716 MW</td>
<td>164,343 MW</td>
</tr>
</tbody>
</table>

Source: www.pjm.com
## Illinois – Offered and Cleared Resources in 2021/22 Auction

(May 23, 2018)

<table>
<thead>
<tr>
<th>Category</th>
<th>Offered MW</th>
<th>Cleared MW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unforced Capacity</td>
<td>25,065</td>
<td>19,864</td>
</tr>
<tr>
<td><strong>Demand Response</strong></td>
<td>2,078</td>
<td>1,998</td>
</tr>
<tr>
<td><strong>Energy Efficiency</strong></td>
<td>788</td>
<td>771</td>
</tr>
<tr>
<td><strong>Total Offered MW</strong></td>
<td>27,930</td>
<td></td>
</tr>
<tr>
<td><strong>Total Cleared MW</strong></td>
<td>22,633</td>
<td></td>
</tr>
</tbody>
</table>

www.pjm.com
Markets
Market Analysis
Illinois’ average daily LMPs were generally lower than 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.
Illinois’ average hourly LMPs were below the PJM average.
Amount of energy produced by Illinois generation within the PJM service territory in 2018.

Note: The portion of Illinois within the PJM footprint produced more than 128.8 million megawatt hours of energy in 2018.

Illinois exports 25.4 percent of the energy produced within the PJM portion of the state. This electricity could go to other states or portions of Illinois outside of the region PJM serves.
Operations
Emissions Data
2005-2018 PJM Average Emissions

Carbon Dioxide
Sulfur Dioxides
Nitrogen Oxides
Illinois Average Emissions (lbs/MWh)

- **Carbon Dioxide**
- **Nitrogen Oxides**
- **Sulfur Dioxides**

February 4, 2019

www.pjm.com
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.