

PJM Interconnection LLC – How to Navigate the Website and Examples of PJM Resources

1. PJM Background:
PJM Interconnection LLC is a regional transmission organization in the United States. It is part of the Eastern Interconnection Grid operating an electric transmission system for all or parts of 13 states and the District of Columbia. It is located in Norristown, Pa. PJM stands for Pennsylvania, New Jersey, and Maryland. PJM provides a lot of information about the grid operations on its website:
www.pjm.com/about-pjm.aspx
2. Electric companies are called **Interconnection Customers** and have to get approval from PJM in order to supply electricity to the PJM Grid. The PJM conducts various studies like impact, feasibility, and lists those studies on the website. Projects are called **queues**. PJM tracks them as active, suspended, or withdrawn.
3. Queues are listed in a master chart. An **active queue** that has been approved by PJM and is producing electricity is classified as being “in-service.” A queue that is no longer being considered as a project is called “**withdrawn**” and a “**suspended**” queue refers to a project that is “paused” after it was approved, but it may not be built for up to 3 years – for various reasons.
4. Each queue, or project, is given a letter code and a name. The name tells us the nearest substation that will receive the electricity. Many substations names are based on the nearest town or municipality. The substations are considered vulnerable to terrorism so there is no public list of substations, hence it is impossible to determine the exact location of a substation other than ground-truthing.
5. The master chart of queues is: www.pjm.com/planning/services-requests/interconnection-queues.aspx
6. Click on the link above to see the chart. It’s listed as “New Services Queue,” but withdrawn and suspended queues will also be included. **Note that only members of PJM can save searches.** You will need to do a new search each time you use the website.
7. It is best to filter out unneeded information. Right below the “saved search bar” are filters. Click on these to filter out what you don’t want to see. For example, here’s what I do:

I click on “State” then I select “None,” then I click on the box by Pennsylvania so I will only see Pennsylvania projects. I can further refine the search by clicking on a certain County in the next box.
8. When I only want to look at Wind projects I look at the chart on the far right at the “Fuel” column. Click on “None” then select “Wind.” Click on Solar if you just want to look at solar projects.
9. The projects are listed in chronological order, from oldest to newest. Scroll to the bottom of the page, left side and click on the Results button, then select “All” to see all the Wind projects. Keep scrolling until you can’t move down any further.
10. There is even more information is you go to the top of the chart, far right, and click on “Phases and Agreements.” Here you can see each study phase for each project and learn more information about the project. The studies can be downloaded as pdfs. The Feasibility study does not typically provide much useful information, but the studies after that reveal the name of the interconnection customer, the project location, cost to connect to the grid, etc.
11. If you are interested in project dates, then click on the top of the chart far right “Dates” and you’ll get that information.

PJM Data Tools:

1. The PJM Data Viewer: <https://dataviewer.pjm.com/dataviewer/pages/public/windpower.jsf>

The link above takes you to a page that shows the PJM RTO Load in the upper left corner. At 4/27/20, around 3 pm, it read 75,493 MW. This is the amount of electricity on the grid that is being used in the PJM RTO (Regional Transmission Organization) to power our homes, businesses, etc.

The graph to the right shows the current amount of wind power that is being generated into the PJM Grid. Right now, it reads 2,193 MW. Hold your cursor over the double line and you'll see the actual generation compared to the forecast at any one time.

What % of the grid is wind energy at this particular time? $2,193 \text{ MW} / 75,493 \text{ MW} \times 100\% = 2.9\%$ of the grid load is supplied by wind at this particular moment. It's usually very insignificant.

2. The PJM Learning Center: <https://learn.pjm.com>

The Center offers a wide variety of basic information about electricity, how PJM operates, and energy innovations, including renewables.

3. A recent report is available that looks at impacts of increasing renewables and gas, with less electricity coming from coal and nuclear. Below is the link and a few excerpts:

<https://www.pjm.com/~media/library/reports-notice/special-reports/20170330-pjms-evolving-resource-mix-and-system-reliability.ashx#Key Findings>

- p. 24: As the amount of coal and nuclear resources in future portfolios decreases, the percent of total attribute capability provided by natural gas resources increases, indicating an increased reliance on natural gas resources to provide reliability attributes.*
- p. 29: Portfolios with the largest unforced capacity shares of wind and solar tended to have the lowest composite reliability indices. This indicates that these portfolios have reduced capability in some of the generator reliability attribute categories, specifically the Essential Reliability Services and Fuel Assurance, relative to the baseline portfolio.*
- *Composite reliability indices generally improved as unforced capacity shares of nuclear, coal and natural gas increased. This is due to these fuel types collectively exhibited the majority of the generator reliability attributes displayed in Figure 6.*
 - *When coal and nuclear units were retired and replaced, portfolios with the highest composite reliability indices tended to be ones in which natural gas is the predominant replacement resource. This is because natural gas provides a broad range of the generator reliability attributes.*
- p. 39: Resource diversity itself, however, is not a measure of reliability.*

4. PJM is regulated by FERC, the Federal Energy Regulatory Commission. The FERC is an independent federal agency that regulates the interstate transmission of electricity, natural gas and oil as well as hydropower and natural gas projects. A recent ruling by FERC (12/19/19) sent shock waves through the power industry, as FERC's ruling could mean higher electricity rates and less integration of renewables in the PJM Grid.

See more at: www.powermag.com/the-significance-of-fercs-recent-pjm-mopr-order-explained/