De-Carbonization / DER Report for NYSRC Executive Committee Meeting 3/10/2023

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The March 2023 edition of the De-Carbonization / Distributed Energy Resources (DER) Report includes the following items:

- NERC Publishes 2022 Annual Report
- U.S. Department of Energy Announces New Actions to Accelerate Floating Offshore Wind Deployment
- The U.S. Department of Energy - Wind Energy Technologies Office
- PJM Report: Energy Transition in PJM: Resource Retirements, Replacements & Risks
- New York Times Article: The U.S. Has Billions for Wind and Solar Projects. Good Luck Plugging Them In
- NYISO Blog: Podcast: Zach Smith on the Interconnection Process and the Growth of Clean Energy
- Snapshot of the NYISO Interconnection Queue: Storage / Solar / Wind / Co-located Storage

NERC Publishes 2022 Annual Report

On February 21st, NERC announced the publication of their Annual Report for 2022, which looks back on NERC's 2022 accomplishments and sets the stage for 2023's strategic focus areas, is structured using the following categories:

- Expanding Risk-Based Focus in Standards, Compliance Monitoring, and Enforcement
- Assessing and Catalyzing Steps to Mitigate Known and Emerging Risks to Reliability and Security
- Building a Strong E-ISAC-Based Security Capability
- Strengthening Engagement across the Reliability and Security Ecosystem in North America
- Capturing Effectiveness, Efficiency, and Continuous Improvement Opportunities

The System Planning Impacts of Distributed Energy Resource Working Group conducted a Comprehensive Review of all NERC Reliability Standards that received RSTC approval in September and was published in October. NERC continues to drive improved resource performance through guidelines, disturbance reports, and Reliability Standard modifications. In 2022, this included a standard authorization request (SAR) to overhaul PRC-024-3 to ensure generator ride-through performance, the enhancement of several existing standards, and considerations for inverter-specific performance standards.

In September, NERC published the Inverter-Based Resource Strategy comprised of specific mitigation activities under four core tenets: risk analysis, interconnection process improvements, best practices and education, and regulatory enhancements. In November, NERC published the Distributed Energy Resource Strategy, comprised of current and future strategic actions necessary to ensure reliable operation of the BPS. The core tenets of the current DER risk mitigation strategy focus on modeling capabilities, studies, operational impacts, and regulatory considerations. NERC also produced two quick reference guides that contain more details on all aspects of work in these areas— Inverter-Based Resource Activities and Distributed Energy Resource Activities.

Additionally in 2022, NERC issued two reports about disturbances that involved inverter-based resources—the Panhandle Wind Disturbance report and the 2022 Odessa Disturbance report. The reports illustrate the need for immediate industry action to ensure reliable operation of the BPS with the ever-increasing penetrations of IBRs.

At its November open meeting, FERC also took action on three items related to IBRs:

- Issuing an order directing NERC to submit a work plan to ultimately register certain IBRs
- A notice of proposed rulemaking directing NERC to develop new or modified Reliability Standards that address the following areas for certain IBRs: data sharing, model validation, planning and operational studies, and performance requirements
- Approving FAC-001-4 and FAC-002-4

U.S. Department of Energy Announces New Actions to Accelerate U.S. Floating Offshore Wind Deployment

On February 22nd, the U.S. Department of Energy (DOE) Announced new investments to secure U.S. leadership in floating offshore wind development by advancing offshore wind transmission planning, research and technology, and partnerships. These announcements are part of the Floating Offshore Wind Shot Summit, with the Departments of Energy, the Interior, Commerce, and Transportation convening stakeholders to drive progress. With two-thirds of America's offshore wind resource located in deep-water areas that require floating platforms, capturing this vast potential could bring the benefits of clean power to millions of American homes and businesses. Today's new actions support the goals of the Administration's Floating Offshore Wind Shot (with link to Video Recording of Summit meeting) to reduce the cost of floating offshore wind energy by more than 70% by 2035 and deploy 15 gigawatts of floating offshore wind by 2035.

With funds from the President's Inflation Reduction Act, DOE is launching a new West Coast Offshore Wind Transmission Study, a 20-month analysis examining how the country can expand transmission to harness power from floating offshore wind for West Coast communities. The study will use its findings to develop practical plans through 2050 to address transmission constraints that currently limit offshore wind development along the nation's West Coast. It is expected to evaluate multiple pathways to reaching offshore wind goals while supporting grid reliability, resilience, and ocean co-use.

This study marks the first announcement stemming from $100 million included within the Inflation Reduction Act for transmission planning and complements an analysis released today by DOE that evaluates existing West Coast offshore wind energy transmission research. The analysis identifies deployment gaps that the wind industry must address to successfully develop offshore wind energy off the nation's West Coast.

The Floating Offshore Wind Shot is part of DOE's Energy Earthshots Initiative, which aims to tackle key technical challenges associated with reaching the administration's climate goals by harnessing untapped renewable energy potential to mitigate climate change and advance the equitable transition to clean energy in America.

- Hydrogen Shot: accelerate innovations and spur demand of clean hydrogen by reducing the cost by 80%
- Long Duration Storage Shot: reducing the cost of grid-scale energy storage by 90% for systems that deliver 10+ hours of duration within the decade.
- Carbon Negative Shot: remove CO_2 from the atmosphere and durably store it at meaningful scales for less than $100/net metric ton of CO_2-equivalent (CO_2e).
- Enhanced Geothermal Shot: reduce the cost of enhanced geothermal systems by 90%, to $45 per megawatt hour by 2035
- Floating Offshore Wind Shot: driving down costs to $45 per megawatt hour by 2035 to spur U.S. leadership in floating offshore wind technology
- Industrial Heat Shot: develop cost-competitive industrial heat decarbonization technologies with at least 85% lower greenhouse gas emissions by 2035

Alongside other offshore wind. efforts highlighted in a White House Fact Sheet, DOE announced these additional research investments and collaborations:

- Expansion of the National Offshore Wind Research and Development Consortium (NOWRDC):
  The consortium announced that California is becoming the seventh state, and first state located along the West Coast, to join the Consortium. Pending final approval, California and the Consortium will fund R&D projects that directly respond to critical, near-term offshore wind development priorities, and bring new focus on reducing costs of floating offshore wind for ratepayers.
- Initiation of Offshore Wind Operations and Maintenance Road map:
  DOE and its Sandia National Laboratories and National Renewable Energy Laboratory (NREL) announced the development of an industry-informed road map for new operations and maintenance technologies and processes to enhance the cost-effectiveness, efficiency, and reliability at offshore wind sites.

The U.S. Department of Energy (DOE) - Wind Energy Technologies Office

The information in this section was derived from the DOE Office of Energy Efficiency & Renewable Energy's Landing Page for Offshore Wind Research and Development. This page provides an overview with links to their Wind Energy Technologies Office (WETO), provides funding for research, development and deployment of offshore wind technologies that can capture wind resources off the coasts of the United States. This robust portfolio will focus on the barriers of relatively high cost of energy, the mitigation of environmental impacts, the technical challenges of project installation, and grid interconnection.

Offshore wind resources are abundant, strong, and consistent. Data on the technical resource potential suggest there are more than 4,000 gigawatts (GW) of capacity, or 13,500 terawatt hours (TWh) of generation, per year in federal waters of the United States and the Great Lakes. While not all of this resource potential will realistically be developed, the magnitude—approximately 3 times the annual electricity consumption in the United States—represents a substantial opportunity to generate electricity near coastal, high-density population centers.

The federal government has an ambitious goal of deploying 30 gigawatts of new offshore wind energy by 2030, which would support 77,000 jobs, power 10 million homes, and cut 78 million metric tons in carbon emissions. Since 2011, WETO has been working with the Department of the Interior's Bureau of Ocean Energy Management to advance a national strategy to facilitate the development of an offshore wind industry in the United States. As part of that strategy, the Department of Energy has allocated over $300 million for competitively-selected offshore wind research, development, and demonstration projects.

Additional links related to Offshore Wind Research and Development include:

- Offshore Wind Initiatives at the U.S. Department of Energy and Fact Sheet
- DOE: National Offshore Wind Strategy Report: Facilitating the Development of the Offshore Wind Industry in the United States
- Advanced Technology Demonstration Projects
  - Lake Erie Energy Development corporation: Icebreaker Project: Up to 20.7 MW wind plant using Mono Bucket foundations
  - University of Maine: New England Aqua Ventus 1 : Up to 12 MW wind plant using a floating concrete semisubmersible
- Market Acceleration Projects

  Offshore Wind Energy Resources and the Environment
  - Wind Resource Characterization and Design Conditions, Environmental Surveys, Monitoring Tools, and Resources, Radar and other Electromagnetic Interference Research

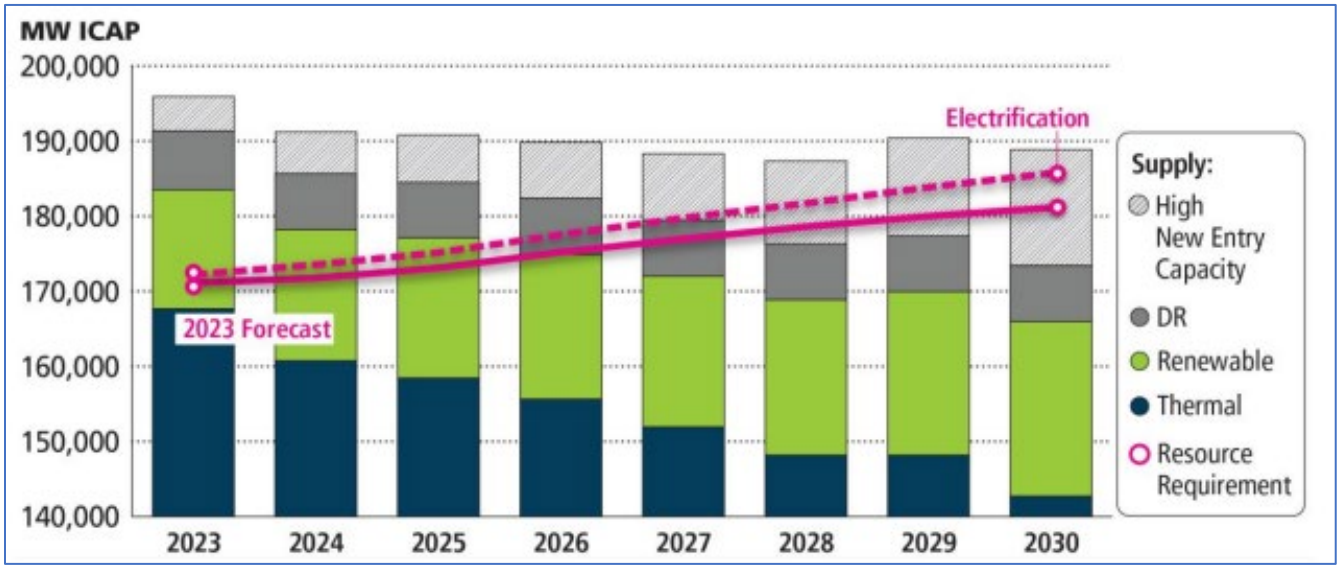
  Planning, Constructing, and Integrating Offshore Wind Energy
  - Transmission Planning and Interconnection Studies, Evaluating Vessels and Ports, Manufacturing and Supply Chain Development, Optimizing Infrastructure and Operations.
- NREL: Floating offshore Wind Array Design: NREL will develop a modeling tool set for optimizing large-scale floating offshore wind farm array designs and create reference designs for several U.S. sites.
- The Ocean Energy Safety Institute, funded by DOE and others, published a Research Road Map for wind energy that identifies strategic targets and pathways based on needs and gaps. The wind energy road map outlines three targets:
  - Safe installation, operation, maintenance and decommissioning of offshore wind energy systems
  - Reduction of human exposure to hazards during installation, operation, maintenance and decommissioning of offshore wind energy systems
  - Training strategies and tools for workforce development.
- The NY State Environmental Technical Working Group has created a Database that compiles data gaps and research needs for environmental effects of offshore wind development along the Atlantic Coast.

PJM Report: Energy Transition in PJM: Resource Retirements, Replacements & Risks

On February 24th, PJM published a White Paper on their website entitled "Energy Transition in PJM: Resource Retirements, Replacements & Risks". This document covers the 3rd phase of a 3 part study, in which explore a range of plausible scenarios up to the year 2030, focusing on the resource mix "balance sheet" as defined by generation retirements, demand growth and entry of new generation.

The analysis shows that 40 GW of existing generation are at risk of retirement by 2030. This figure is based on the following: 6 GW of 2022 deactivations, 6 GW of announced retirements, 25 GW of potential policy-driven retirements and 3 GW of potential economic retirements. Combined, this represents 21% of PJM's current installed capacity. In addition to the retirements, PJM's long-term load forecast shows demand growth of 1.4% per year for the PJM footprint over the next 10 years. Due to the expansion of highly concentrated clusters of data centers, combined with overall electrification, certain individual zones exhibit more significant demand growth – as high as 7% annually.

For the first time in recent history, PJM could face decreasing reserve margins (as shown in the graphic below) should these trends continue. The amount of generation retirements appears to be more certain than the timely arrival of replacement generation resources and demand response, given that the quantity of retirements is codified in various policy objectives, while the impacts to the pace of new entry of the Inflation Reduction Act, post-pandemic supply chain issues, and other externalities are still not fully understood.



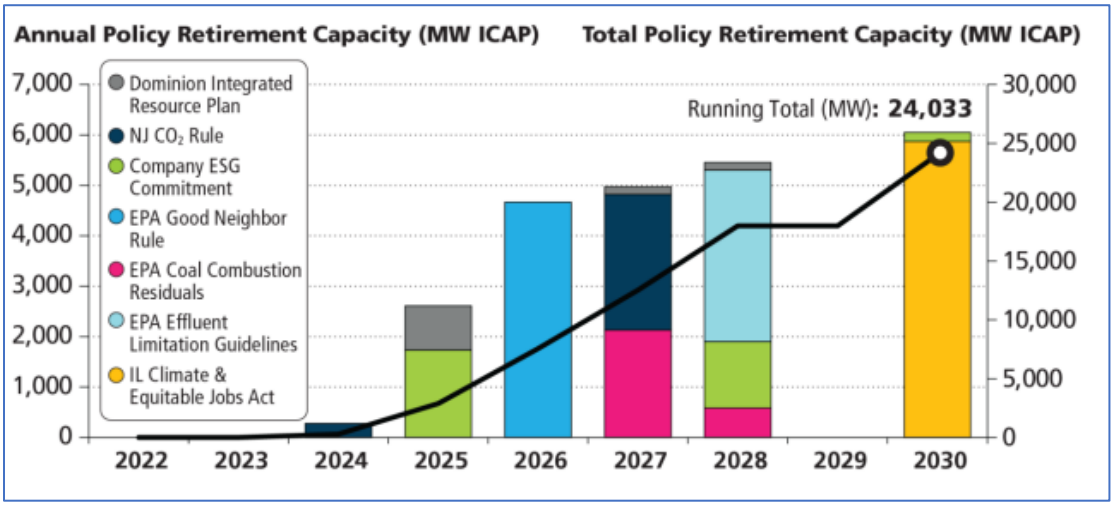
The findings of this study highlight the importance of PJM's ongoing stakeholder initiatives (Resource Adequacy Senior Task Force, Clean Attribute Procurement Senior Task Force, Interconnection Process Subcommittee), continued efforts between PJM and state and federal agencies to manage reliability impacts of policies and regulations, and the urgency for coordinated actions to shape the future of resource adequacy. The potential for an asymmetrical pace in the energy transition, in which resource retirements and load growth exceed the pace of new entry, underscores the need to enhance the accreditation, qualification and performance requirements of capacity resources.

Below are the policies and regulations included in the study:

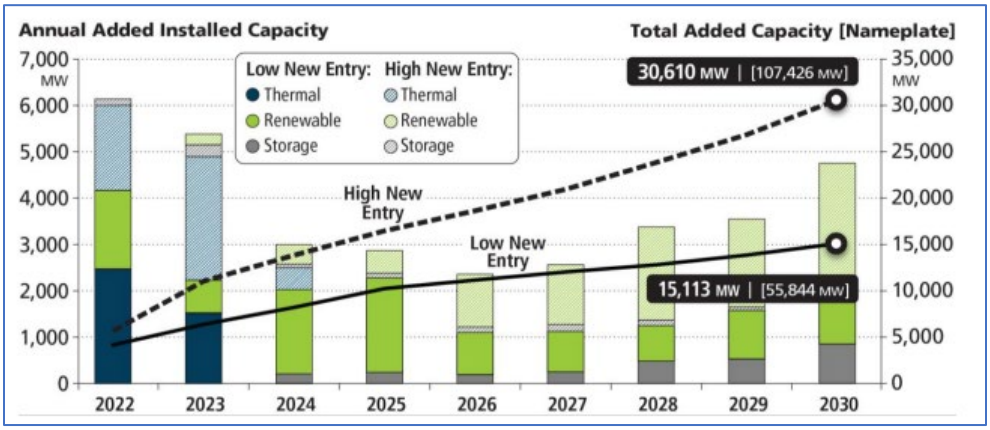
- EPA Coal Combustion Residuals (CCR): National minimum criteria for existing and new coal combustion residuals (CCR) landfills and existing and new CCR surface impoundments. This led to a number of facilities, approximately 2,700 MW in capacity, indicating their intent to comply with the rule by ceasing coal-firing operations, which is reflected in this study.
- EPA Effluent Limitation Guidelines (ELG): The EPA updated these guidelines in 2020, which triggered the announcement by Keystone and Conemaugh facilities (about 3,400 MW) to retire their coal units by the end of 2028. The EPA is expecting this to impact coal units by potentially requiring investments when plants renew their discharge permits and extending the time that plants can operate if they agree to a retirement date.
- EPA Good Neighbor Rule (GNR): This proposal requires units in certain states to meet stringent limits on emissions of nitrogen oxides (NOx), which, for certain units, will require investment in selective catalytic reduction to reduce NOx. For purposes of this study, it is assumed that unit owners will not make that investment and will retire approximately 4,400 MW of units instead.
- Illinois Climate & Equitable Jobs Act (CEJA): CEJA mandates the scheduled phase-out of coal and natural gas generation by specified target dates: January 2030, 2035, 2040 and 2045. For this study, PJM focuses on the approximately 5,800 MW expected to retire in 2030.
- New Jersey Department of Environmental Protection CO_2 Rule: New Jersey's CO_2 rule seeks to reduce carbon dioxide (CO_2) emissions of fossil fuel-fired electric generating units (EGUs) through the application of emissions limits for existing and new facilities greater than 25 MW. Units must meet a CO_2 output-based limit by tiered start dates. The dates and CO_2 limits are:
  - June 1, 2024 – 1,700 lb/MWh
  - June 1, 2027 – 1,300 lb/MWh
  - June 1, 2035 – 1,000 lb/MWh

  PJM used emissions data found in EPA Clean Air Markets Program Data (CAMPD) to evaluate unit compliance. Where a unit's average annual emissions rate was greater than the CO_2 limit on the compliance date, the unit was assumed to be retiring. In this study PJM, estimated retirements at approximately 400 MW in 2024 and approximately 2,700 MW in 2027.
- Company ESG (Environmental, Social, Governance) commitments are included where there is a commitment to retire resources per legal consent decree or other public statement. This includes the elimination of coal use and the retirement of the Brandon Shores, 1,273 MW, and Wagner, 305 MW, facilities in Maryland and the retirement of Rockport, 1,318 MW, in Indiana.

The Graphic below shows potential Policy-based retirements, based on the rules described above:

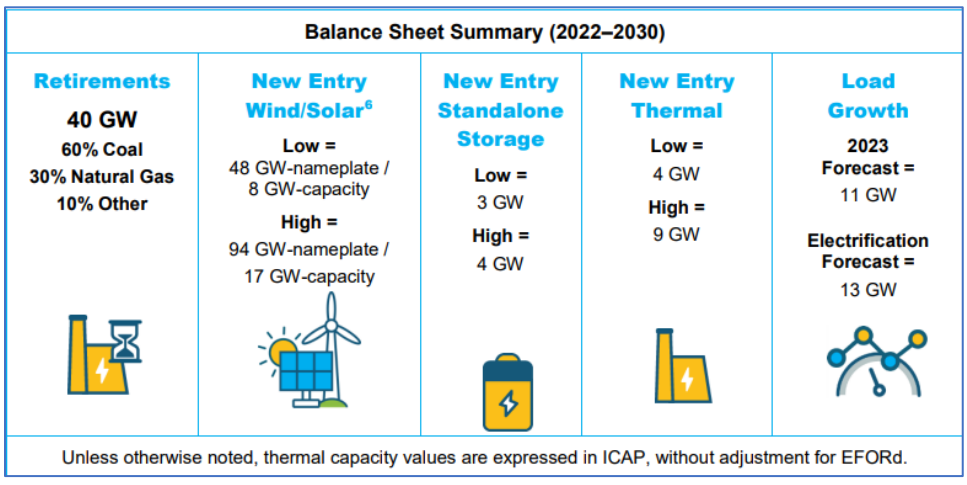


PJM's projected resource mix continues to evolve toward lower-carbon intermittent resources. Entry into the queue from renewable and storage resources has been growing at an annualized rate of 72% per year since 2018, or 199 GW of capacity entry versus 2.8 GW commercializing and 42.1 GW withdrawn. PJM and its stakeholders have enacted queue reforms intended to clear the backlog of projects, improve procedures around permitting and site control, simplify analysis by clustering projects, and accelerate projects that don't require upgrades. FERC approved the proposed package in November 2022, with expected implementation in 2023.



Load forecasting is an important part of maintaining the reliability of the bulk electric system. PJM's Resource Adequacy Planning Department publishes an annual Load Forecast Report, which outlines "long-term load forecasts of peak-loads, net energy, load management, distributed solar generation, plug-in electric vehicles and battery storage." Additionally, PJM is expecting an increase in electrification resulting from state and federal policies and regulations. This accelerated demand increase is consistent with the methodology used in the Emerging Characteristics of a Decarbonizing Grid paper. That paper found electrification to have an asymmetrical impact on demand growth, with demand growth in the winter, mainly due to heating, more than doubling that in the summer. This would move the bulk of resource adequacy risk from summer to winter.

The image below shows various retirements, additions and load growth contributions for this study:



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New York Times Article: The U.S. Has Billions for Wind and Solar Projects. Good Luck Plugging Them In

This New York Times Article was published on February 23rd, 2023. The energy transition poised for takeoff in the United States amid record investment in wind, solar and other low-carbon technologies is facing a serious obstacle: The volume of projects has overwhelmed the nation's antiquated systems to connect new sources of electricity to homes and businesses. So many projects are trying to squeeze through the approval process that delays can drag on for years, leaving some developers to throw up their hands and walk away.

More than 8,100 energy projects — the vast majority of them wind, solar and batteries — were waiting for permission to connect to electric grids at the end of 2021, up from 5,600 the year before. PJM Interconnection, which operates the nation's largest regional grid, stretching from Illinois to New Jersey, has been so inundated by connection requests that last year it announced a freeze on new applications until 2026, so that it can work through a backlog of thousands of proposals, mostly for renewable energy.

It now takes roughly four years, on average, for developers to get approval, double the time it took a decade ago. When companies finally get their projects reviewed, they often face another hurdle: the local grid is at capacity, and they are required to spend much more than they planned for new transmission lines and other upgrades. Many give up. Fewer than one-fifth of solar and wind proposals actually make it through the so-called interconnection queue, according to research from Lawrence Berkeley National Laboratory.

After years of breakneck growth, large-scale solar, wind and battery installations in the United States fell 16 percent in 2022, according to the American Clean Power Association, a trade group. It blamed supply chain problems but also lengthy delays connecting projects to the grid.

Electricity production generates roughly one-quarter of the greenhouse gases produced by the United States; cleaning it up is key to President Biden's plan to fight global warming. The landmark climate bill he signed last year provides $370 billion in subsidies to help make low-carbon energy technologies — like wind, solar, nuclear or batteries — cheaper than fossil fuels.

But the law does little to address many practical barriers to building clean energy projects, such as permitting holdups, local opposition or transmission constraints. Unless those obstacles get resolved, experts say, there's a risk that billions in federal subsidies won't translate into the deep emissions cuts envisioned by lawmakers.

PJM, the grid operator, now has 2,700 energy projects under study — mostly wind, solar and batteries — a number that has tripled in just three years. Wait times can now reach four years or more, which prompted PJM last year to pause new reviews and overhaul its processes. Delays can upend the business models of renewable energy developers. As time ticks by, rising materials costs can erode a project's viability. Options to buy land expire. Potential customers lose interest.

Two years ago, Silicon Ranch, a solar power developer, applied to PJM for permission to connect three 100-megawatt solar projects in Kentucky and Virginia, enough to power tens of thousands of homes. The company, which often pairs its solar arrays with sheep grazing, had negotiated purchase options with local landowners for thousands of acres of farmland. Today, that land is sitting empty. Silicon Ranch hasn't received feedback from PJM and now estimates it may not be able to bring those solar farms online until 2028 or 2029. That creates headaches: The company may have to decide whether to buy the land before it even knows whether its solar arrays will be approved.

PJM soon plans to speed up its queues by studying projects in clusters rather than one at a time, but needs to clear its backlog first.

A potentially bigger problem for solar and wind is that, in many places around the country, the local grid is clogged, unable to absorb more power. That means if a developer wants to build a new wind farm, it might have to pay not just for a simple connecting line, but also for deeper grid upgrades elsewhere. One planned wind farm in North Dakota, for example, was asked to pay for multimillion-dollar upgrades to transmission lines hundreds of miles away in Nebraska and Missouri. These costs can be unpredictable. In 2018, EDP North America, a renewable energy developer, proposed a 100-megawatt wind farm in southwestern Minnesota, estimating it would have to spend $10 million connecting to the grid. But after the grid operator completed its analysis, EDP learned the upgrades would cost $80 million. It canceled the project.

That creates a new problem: When a proposed energy project drops out of the queue, the grid operator often has to redo studies for other pending projects and shift costs to other developers, which can trigger more cancellations and delays. It also creates perverse incentives, experts said. Some developers will submit multiple proposals for wind and solar farms at different locations without intending to build them all. Instead, they hope that one of their proposals will come after another developer who has to pay for major network upgrades. The rise of this sort of speculative bidding has further jammed up the queue.

A better approach would be for grid operators to plan transmission upgrades that are broadly beneficial and spread the costs among a wider set of energy providers and users, rather than having individual developers fix the grid incrementally. As precedent, in the 2000s, Texas officials saw that existing power lines wouldn't be able to handle the growing number of wind turbines being built in the blustery plains of West Texas and planned billions of dollars in upgrades. Texas now leads the nation in wind power. Similarly, MISO, a grid spanning 15 states in the Midwest, recently approved $10.3 billion in new power lines, partly because officials could see that many of its states had set ambitious renewable energy goals and would need more transmission.

As grid delays pile up, regulators have taken notice. Last year, the Federal Energy Regulatory Commission proposed two major reforms to streamline interconnection queues and encourage grid operators to do more long-term planning. The fate of these rules is unclear, however. In December, Richard Glick, the former regulatory commission chairman who spearheaded both reforms, stepped down after clashing with Senator Joe Manchin III, Democrat of West Virginia, over unrelated policies around natural gas pipelines. The commission is now split between two Democrats and two Republicans; any new reforms need majority approval.

If the United States can't fix its grid problems, it could struggle to tackle climate change. Researchers at the Princeton-led Rapid Energy Policy Evaluation and Analysis Toolkit (REPEAT) project recently estimated that new federal subsidies for clean energy could cut electricity emissions in half by 2030. But that assumes transmission capacity expands twice as fast over the next decade. If that doesn't happen, the researchers found, emissions could actually increase as solar and wind get stymied and existing gas and coal plants run more often to power electric cars.

Massachusetts and Maine offer a warning. In both states, lawmakers offered hefty incentives for small-scale solar installations. Investors poured money in, but within months, grid managers were overwhelmed, delaying hundreds of projects.

Additional Links:

- ENEL Green Power working Paper
  - Plugging In: A Road map for Modernizing & Integrating interconnection and Transmission Planning

- PV Magazine – 2/15/23
  - Interconnection Delays Slow U.S. Community Solar Growth

NYISO: Announcements on the Blog Page of the NYISO Website:
Features from the NYISO Blog Page include the following:

Podcast: VP Zach Smith on the Interconnection Process and the Growth of Clean Energy on the Grid
In this podcast, he describes how the NYISO is required to study the impacts of new resources like large wind, solar and battery storage facilities seeking to connect to the electric system. Smith discusses the three successive studies that examine the impact of each new resource, as well as their collective impact and the potential need for system upgrades. The process involves continuous collaboration between the developers, local utilities, and the NYISO. Some project proposals are more fully realized than others. Sometimes a resource will elect to drop out of the process, requiring a new round of studies, adding to the time it takes for all remaining resources to get to the end.

State and federal clean energy policies are driving a dramatic increase in clean energy projects entering the Interconnection Queue, where they will be studied for feasibility and grid reliability impacts. The process requires the expertise of many of the NYISO's most skilled engineers and analysts.

The Interconnection Queue has experienced change. A few years ago, it was typical to see between one and two hundred resources applying. Today, the Interconnection Queue contains nearly 500 proposals. Factors driving this historic growth include New York's requirement of a zero-emissions grid by 2040, new incentives to build new solar, wind, and storage resources, and public policy needs that incentivize new transmission investment.

Additional Resources:

- Paper: The NYISO Interconnection Process
- Press Release: NYISO Completes Interconnection Study Process to Connect New Resources to the Electric Grid
- Explainer: How New Electric Resources Connect to the Grid
- Capital Pressroom: Ensuring Reliable Power Amid Green Energy Transition, an audio interview with Kevin Lanahan, Vice President of External Affairs for the NYISO.

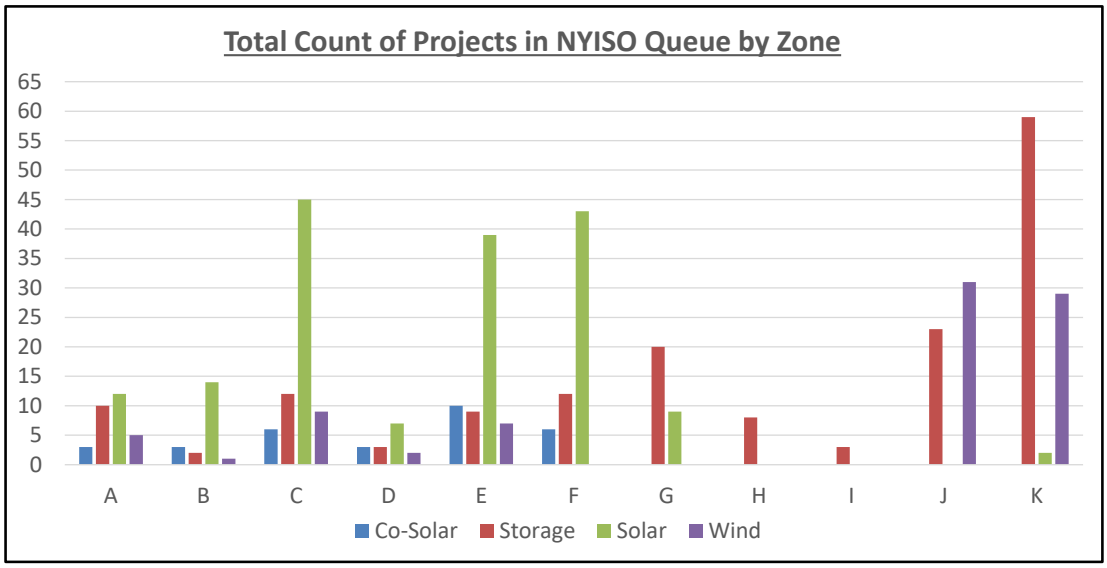
Interconnection Queue: Monthly Snapshot – Storage / Solar / Wind / CSRs (Co-located Storage)

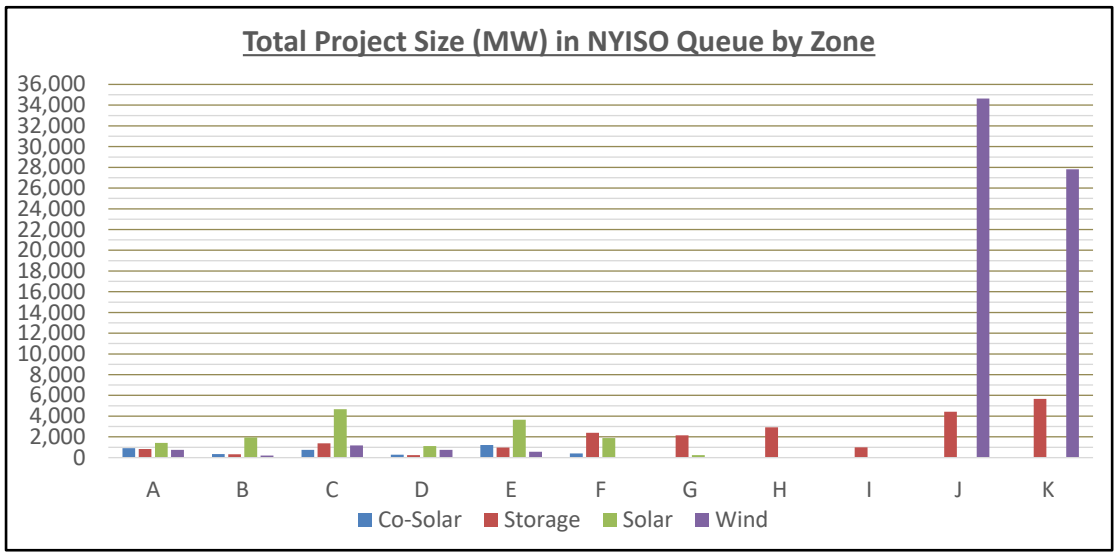
The intent is to track the growth of Energy Storage, Wind, Solar and Co-Located Storage (Solar and Wind now in separate categories) projects in the NYISO Interconnection Queue, looking to identify trends and patterns by zone and in total for the state. The information was obtained from the NYISO Interconnection Website, based on information published on February 20th, and representing the Interconnection Queue as of January 31st. Note that 11 projects were added, and 23 were withdrawn during the month of January. Results are tabulated below and shown graphically on the next page.

Total Count of Projects in NYISO Queue by Zone				
Zone	Co-Solar	Storage	Solar	Wind
A	3	10	12	5
B	3	2	14	1
C	6	12	45	9
D	3	3	7	2
E	10	9	39	7
F	6	12	43	
G		20	9	
H		8		
I		3		
J		23		31
K		59	2	29
State	31	161	171	84

Total Project Size (MW) in NYISO Queue by Zone				
Zone	Co-Solar	Storage	Solar	Wind
A	920	839	1,408	738
B	346	320	1,945	200
C	745	1,375	4,661	1,184
D	272	240	1,107	747
E	1,210	970	3,651	565
F	400	2,389	1,892	
G		2,153	243	
H		2,923		
I		1,000		
J		4,417		34,646
K		5,672	59	27,820
State	3,892	22,298	14,965	65,901

Average Size (MW) of Projects in NYISO Queue by Zone				
Zone	Co-Solar	Storage	Solar	Wind
A	307	84	117	148
B	115	160	139	200
C	124	115	104	132
D	91	80	158	374
E	121	108	94	81
F	67	199	44	
G		108	27	
H		365		
I		333		
J		192		1,118
K		96	29	959
State	126	138	88	785


Total Count of Projects in NYISO Queue by Zone
65
60
55
50
45
40
35
30
25
20
15
10
5
0
A
B
C
D
E
F
G
H
I
J
K
Co-Solar
Storage
Solar
Wind


Total Project Size (MW) in NYISO Queue by Zone
36,000
34,000
32,000
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
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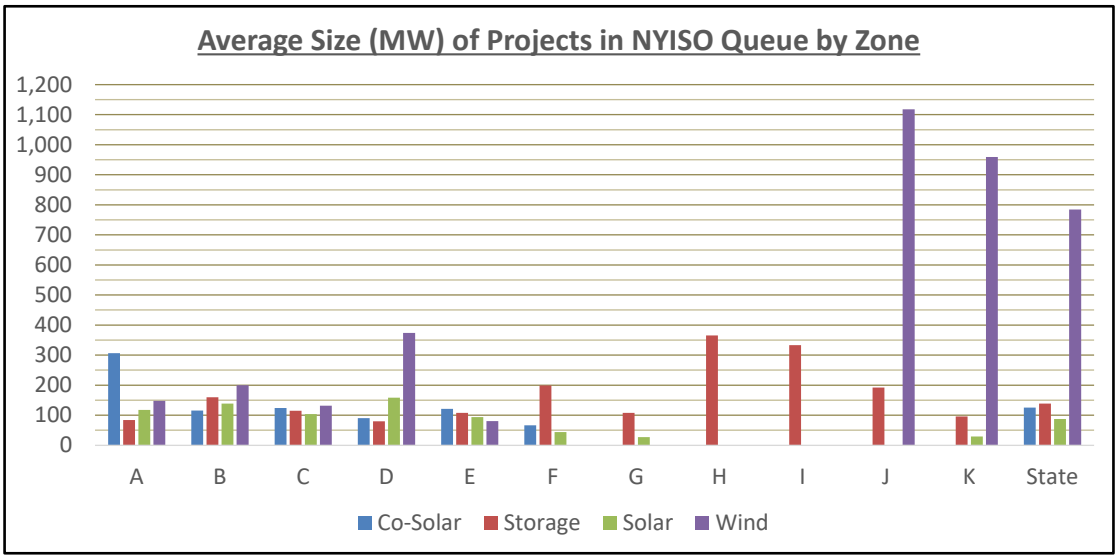
Co-Solar
Storage
Solar
Wind


Average Size (MW) of Projects in NYISO Queue by Zone
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
A
B
C
D
E
F
G
H
I
J
K
State
Co-Solar
Storage
Solar
Wind