De-Carbonization / DER Report for NYSRC Executive Committee Meeting 3/14/2025

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The March 2025 edition of the De-Carbonization / Distributed Energy Resources (DER) Report includes the following items:

- Utility Dive: New York PSC approves retail and residential storage plan as 6-GW 2030 target in question
- Canary Media Four Articles Series: Boon or Bane - What will Data Centers do to the Grid?
- Snapshots of the NYISO Interconnection Queue and Cluster Queue: Storage / Solar / Wind / Co-located

Utility Dive: New York PSC Approves Retail and Residential Storage Plan As 6-GW 2030 Target in Question

This Utility Dive Brief recounts how the New York State Public Service Commission has approved the state's retail and residential energy storage implementation plan, a significant step in its effort to reach 6 GW of energy storage by 2030. The Feb. 13 order approved a framework to reach the state's retail storage deployment goal of 1,500 MW and its residential storage deployment goal of 200 MW. It also includes incentives for resources participating in the New York Independent System Operator's distributed energy resources program to also be eligible for the retail storage incentive, the PSC said.

The plan was approved as a new forecast by Aurora Energy Research shows New York falling "marginally short" of its 2030 energy storage target despite an expected deployment surge in the late 2020s, but reaching 30 GW of deployed storage capacity by 2050. The 6-GW goal represents a doubling of the previous 2030 goal of 3 GW. It envisions 1.7 GW of new retail and residential storage plus 3 GW of new bulk storage added to about 1.3 GW of existing storage assets being procured by or under contract with the state as of April 1, 2024.

Following the adoption this month of its retail and residential implementation plan, the New York State Energy Research and Development Authority expects to make the first of three annual bulk storage solicitations by the end of June for deployment in 2027 and 2028. It plans subsequent storage solicitations in 2026 and 2027 for deployment in 2028 through 2030.

New York has 430 MW of operational battery energy storage capacity as of January, most of it in the central and downstate regions, according to the Aurora report. Though the average project is 2.5 hours, durations range from 15 minutes to 8 hours, indicating "the state is still trying to figure out the role batteries are going to play," said Julia Hoos, Aurora's head of USA East. "Shorter-duration batteries generally perform ancillary grid services, while longer-duration installations fill capacity and reliability needs."

Following NYISO's implementation of Federal Energy Regulatory Commission Order 2023, batteries make up nearly half of the 60 GW of projects in its cluster study process, which evaluates projects in groups rather than individually. Batteries also account for 2.5 GW of capacity remaining in the main interconnection queue, according to the Aurora report. Fifty-five percent of main-queue capacity is expected to come online in 2027 and 2028, and 70% is slated for the congested New York City and Long Island grids, Aurora said.

While the main NYISO interconnection queue is proportionally smaller than the nationwide queue, where capacity awaiting interconnection exceeds total installed capacity, New York's queued storage projects are generally less speculative, Hoos said. New York must deploy new energy storage resources at scale to zero out power-sector emissions by 2040, as required by state law. By then, Aurora's "merchant base case" scenario envisions 30 GW of flexible resources — including batteries and thermal peaking resources, supplying New York's grid alongside 17 GW of offshore wind capacity.

Canary Media Series of Four Articles on Data Centers – Boon or Bane: What will Data Centers do to the Grid?

This series of four related and sequential articles explore the impacts of data center growth on the grid:

- Data centers are overwhelming the grid. Could they help it instead?
- Utilities are flying blind on data center demand. That's a big Problem
- How to build data centers without raising grid costs — and emissions
- One way data centers can help the grid - By being flexible

In January, Virginia lawmakers unveiled a raft of legislation aimed at putting some guardrails on a data center industry whose insatiable hunger for electricity threatens to overwhelm the grid. As the home of the world's densest data center hub, Virginia is on the vanguard of dealing with these challenges. But the state is far from alone in a country where data center investments may exceed $1 trillion by mid-2029, driven in large part by "hyperscalers" (Large-scale data centers) with aggressive AI goals, like Amazon, Google, Meta, and Microsoft.

"If we fail to act, the unchecked growth of the data center industry will leave Virginia's families, will leave their businesses, footing the bill for infrastructure costs, enduring environmental degradation, and facing escalating energy rates," state Sen. Russet Perry, a Democrat representing Loudoun County, the heart of Virginia's "Data Center Alley," told reporters at the state capitol in Richmond last month. "The status quo is not sustainable."

Perry's position is backed by data. A December report commissioned by Virginia's legislature found that a buildout of data centers to meet "unconstrained demand" would double the state's electricity consumption by 2033 and nearly triple it by 2040. To meet the report's unconstrained scenario, Virginia would need to erect twice as many solar farms per year by 2040 as it did in 2024, build more wind farms than all the state's current offshore wind plans combined, and install three times more battery storage than Dominion Energy, the state's biggest utility, now intends to build.

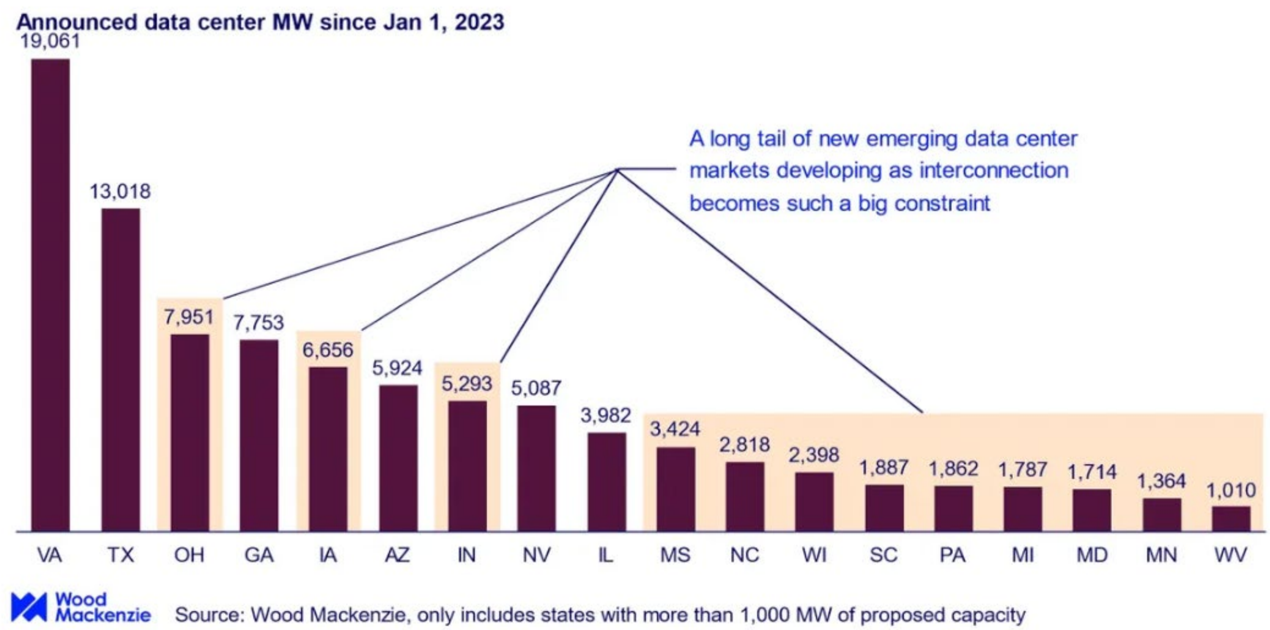
Even then, Virginia would need to double current power imports from other states. And it would still need to build new fossil-gas power plants, which would undermine a state clean energy mandate. Meeting just half the unconstrained demand would require building seven new 1.5-gigawatt gas plants by 2040. That's nearly twice the 5.9 gigawatts' worth of gas plants Dominion now plans to build by 2039, a proposal that is already under attack by environmental and consumer groups.

Data centers are big business in Virginia. Gov. Glenn Youngkin, a Republican, has called for the state to "continue to be the data center capital of the world," citing the up to 74,000 jobs, $9.1 billion in GDP, and billions more in local revenue the industry brings. Most of the proposed data center bills, which include mandates to study how new data centers could impose additional costs on other utility customers and worsen grid reliability, have failed to move forward in the state legislature as of mid-February.

From the mid-Atlantic down to Texas, tech giants and data center developers are demanding more power as soon as possible. If utilities, regulators, and policymakers move too rashly in response, they could unleash a surge in fossil-gas power-plant construction that will drive up consumer energy costs — and set back progress on shifting to carbon-free energy.

The utility Arizona Public Service forecasts that data centers will account for half of new power demand through 2038. In Texas, data centers will make up roughly half the forecasted new customers that are set to cause summer peak demand to nearly double by 2030. Georgia Power, that state's biggest utility, has since 2023 tripled its load forecast over the coming decade, with nearly all of that load growth set to come from the projected demands of large power customers including data centers.

These saturated conditions are pushing developers into new markets, as the below chart from the energy consultancy Wood Mackenzie shows.



(Wood Mackenzie)

Some tech firms intend to rely on unproven technologies like small modular nuclear reactors to build emissions-free data centers, an approach that analysts say is needlessly unreliable. Others want to divert electricity from existing nuclear plants — as Amazon hopes to do in Pennsylvania — which simply shifts clean power from utility grids to tech companies. Yet others are simply embracing new gas construction as the best path forward for now, albeit with promises to use cleaner energy down the road, as Meta is doing in Louisiana.

Meanwhile, several fossil fuel companies are hoping to convince tech firms and data center developers to largely avoid the power grid by building fossil-gas-fired plants that solely serve data centers — an idea that's both antithetical to climate goals and, according to industry analysts, impractical.

The basic mandate of utilities is to provide reliable and affordable energy to all customers. Many utilities also have mandates, issued by either their own executives or state policymakers, to build clean energy and cut carbon emissions. But the scale and urgency of the data center boom puts these priorities on a collision course. In Georgia, the Clean Energy Buyers Association and utility Georgia Power are negotiating to give tech companies more freedom to contract for clean energy supplies. In North Carolina, Duke Energy is working with Amazon, Google, Microsoft, and steelmaker Nucor to create tariffs for long-duration energy storage, modular nuclear reactors, and other "clean firm" resources. In Nevada, utility NV Energy and Google have proposed a "clean transition tariff," which would commit both companies to securing power from an advanced geothermal plant that Fervo Energy is planning.

Right now, top-tier tech companies appear willing to pay extra for clean power, said Alex Kania, managing director of equity research at Marathon Capital, an investment banking firm focused on clean infrastructure. He pointed to reports that Microsoft is promising to pay Constellation Energy roughly twice the going market price for long-term electricity supply for the zero-carbon power it expects to secure from restarting a unit of the former Three Mile Island nuclear plant.

In fact, portfolios of new solar, wind, and batteries are cheaper than new gas-fired power plants in most of the country. Instead, the core barrier to getting clean power online — be it for data centers or other large-scale power buyers, or even just for utilities — is the limited capacity of the power grid itself.

Across much of the U.S., hundreds of gigawatts of solar, wind, and battery projects are held up in years-long waitlists to get interconnected to congested transmission grids. Facing this situation, some data center developers are targeting parts of the country where they can build their own clean power and avoid as much of the grid logjam as possible.

In November, for example, Google, infrastructure investor TPG Rise Climate, and clean power developer Intersect Power unveiled a plan to invest $20 billion by 2030 into clusters of wind, solar, and batteries that are largely dedicated to powering newly built data centers.

Think tank Energy Innovation has cited this "energy park" concept as a neat solution to the twin problems of grid congestion and ballooning power demand. Combining generation and a big customer behind a single interconnection point can "speed up development, share costly onsite infrastructure, and directly connect complementary resources," policy adviser Eric Gimon wrote in a December report.

And while many existing data center hubs aren't well suited to energy parks, plenty of other places around the country are, said Gary Dorris, CEO and cofounder of energy analysis firm Ascend Analytics. Swaths of the Great Plains states, "roughly from Texas to the Dakotas," offer "the combination of wind and solar, and then storage, to get to close to 100%" of a major power customer's electricity needs. That's not to say that building these energy parks will be simple. There's the sheer amount of land required. A gigawatt-scale data center may occupy a few hundred acres, but powering it will take about 5,000 acres of solar and another 10,000 for wind turbines.

And then there are the regulatory hurdles involved. Almost all U.S. utilities hold exclusive rights to provide power and build power-delivery infrastructure within the territories they serve. The exception is Texas, which has a uniquely competitive energy regulatory regime. Intersect Power plans to build an energy park with Google and TPG Rise Climate in Texas, and the partners haven't disclosed if they're working on projects in other states.

A growing number of companies are targeting data centers as potential new customers for gas-fired power, including oil and gas majors. ExxonMobil announced plans to enter the power-generation business in December, proposing to build a massive gas-fired power plant dedicated to powering data centers. A partnership between Chevron, investment firm Engine No. 1, and GE Vernova launched last month with a promise to build the country's "first multi-gigawatt-scale co-located power plant and data center."

One idea for making data centers flexible focuses not on the power they can generate and store but on the power they use. Demand response refers to the practice of throttling power used during peak grid stress, or shifting that power use to other times when the grid can handle it better, in exchange for payments from utilities or revenues in energy markets. Historically, data centers haven't been interested in standard demand-response programs and markets. The value of what they do with that electricity is just too high compared with the potential rewards. But if a data center's participation in a demand-response program is the difference between it getting a grid connection or not, the programs become a lot more appealing.

Data center developers have the ability to minimize or even help drive down power system costs and carbon emissions. They can work with utilities and regulators to bring more clean energy and batteries onto the grid or at data centers themselves. They can manage their demand to reduce grid strains and lower the costs of the infrastructure needed to serve them. And in so doing, they could secure scarce grid capacity in places where utilities are otherwise struggling to serve them.

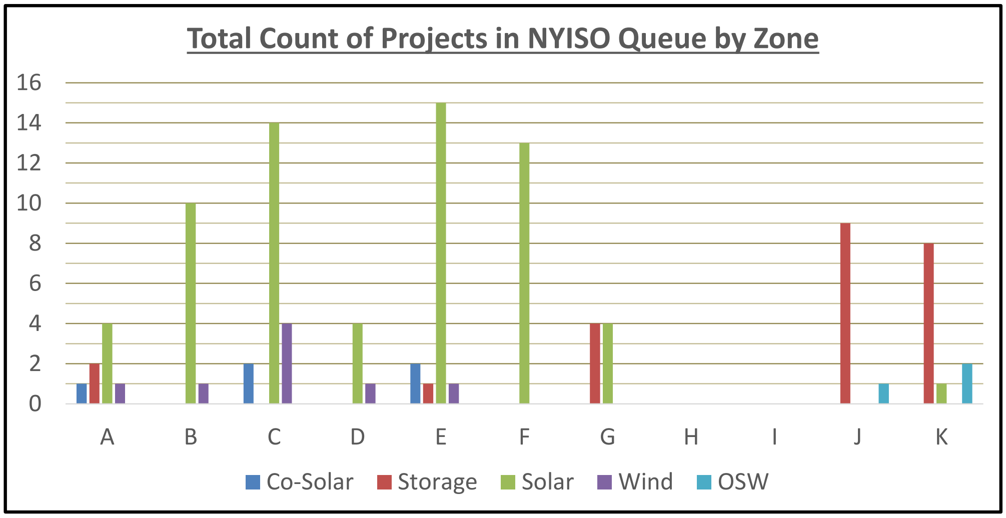
Interconnection Queue: Monthly Snapshot – Storage / Solar / Wind / CSRs (Co-located Storage)

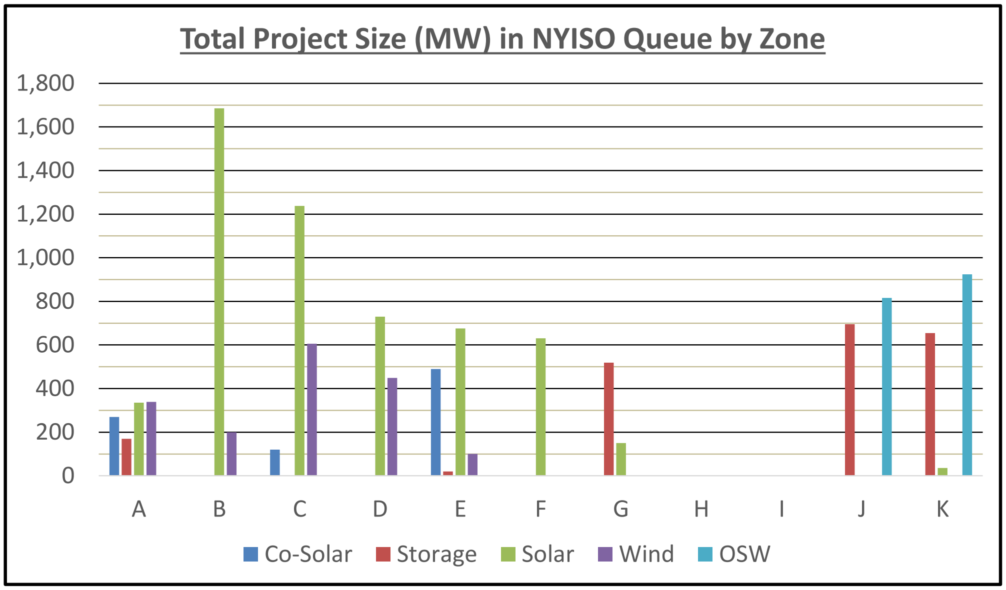
The intent is to track the growth of Co-Located Solar / Storage, Energy Storage, Solar, Wind, and Offshore Wind (OSW) projects in the NYISO Interconnection Queue, looking to identify trends and patterns by zone and in total for the state. The information was obtained from the NYISO Interconnection Website, based on information published on January 20th, and representing the Interconnection Queue as of January 31st. Note that only 1 project were added, and 19 were withdrawn during the month of January.

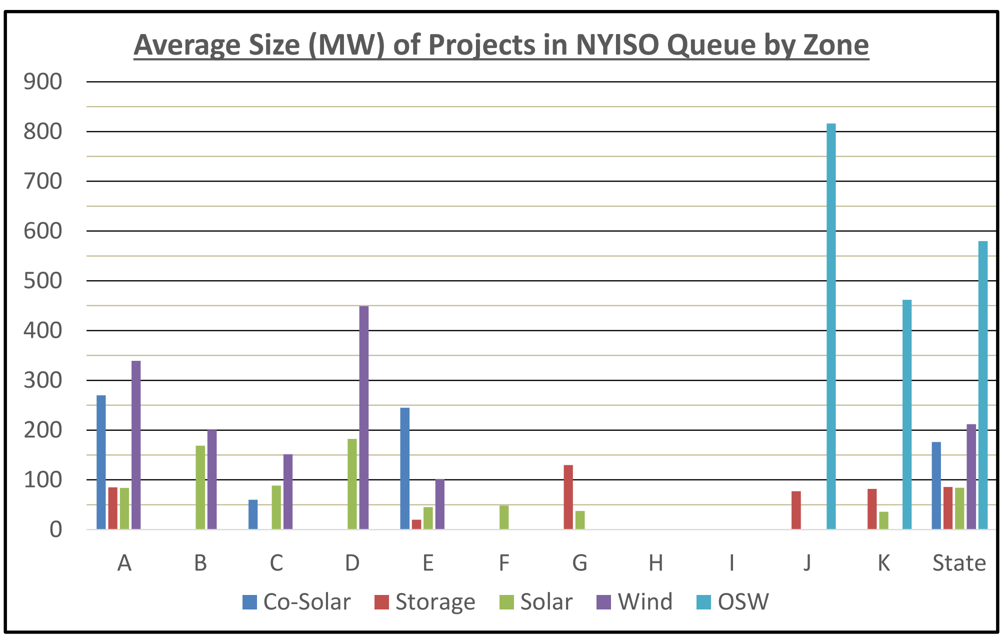
Total Count of Projects in NYISO Queue by Zone					
Zone	Co-Solar	Storage	Solar	Wind	OSW
A	1	2	4	1	
B			10	1	
C	2		14	4	
D			4	1	
E	2	1	15	1	
F			13		
G		4	4		
H					
I					
J		9			1
K		8	1		2
State	5	24	65	8	3

Total Project Size (MW) in NYISO Queue by Zone					
Zone	Co-Solar	Storage	Solar	Wind	OSW
A	270	170	335	339	
B			1,685	200	
C	120		1,238	606	
D			730	449	
E	490	20	676	101	
F			631		
G		519	150		
H					
I					
J		695			816
K		655	36		924
State	880	2,059	5,481	1,695	1,740

Average Size (MW) of Projects in NYISO Queue by Zone					
Zone	Co-Solar	Storage	Solar	Wind	OSW
A	270	85	84	339	
B			169	200	
C	60		88	151	
D			183	449	
E	245	20	45	101	
F			49		
G		130	38		
H					
I					
J		77			816
K		82	36		462
State	176	86	84	212	580


Total Count of Projects in NYISO Queue by Zone
16
14
12
10
8
6
4
2
0
A
B
C
D
E
F
G
H
I
J
K
Co-Solar
Storage
Solar
Wind
OSW


Total Project Size (MW) in NYISO Queue by Zone
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
A
B
C
D
E
F
G
H
I
J
K
Co-Solar
Storage
Solar
Wind
OSW


Average Size (MW) of Projects in NYISO Queue by Zone
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
OSW

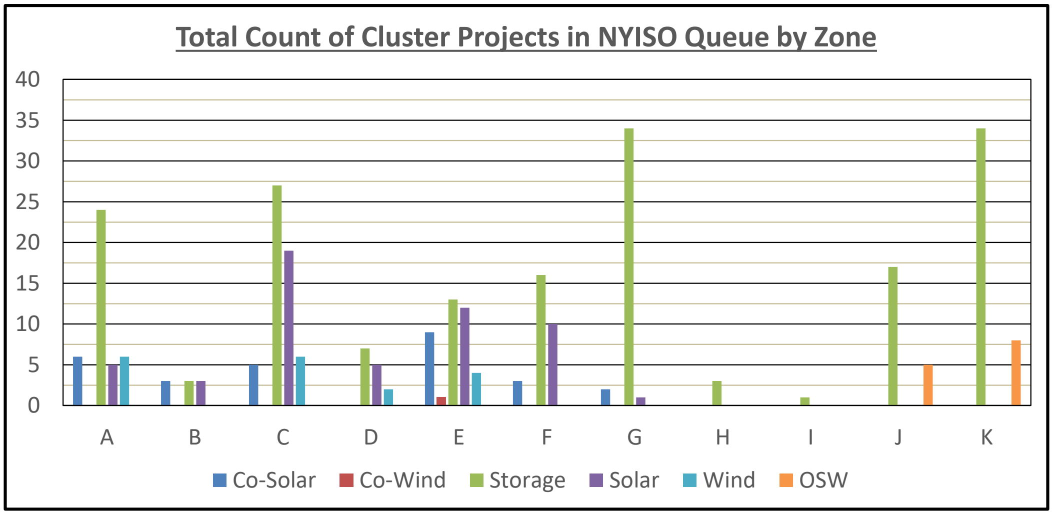
Cluster Interconnection Queue: Monthly Snapshot – Storage / Solar / Wind / CSRs (Co-located Storage)

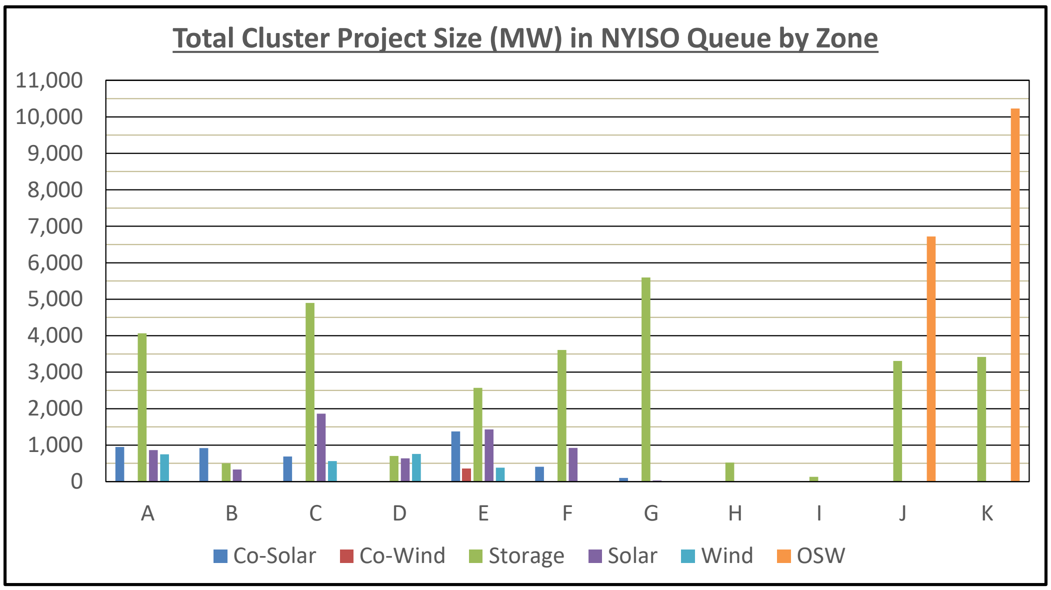
The intent is to track the growth of the Cluster-based projects, including Co-Located Solar and Wind / Storage, Energy Storage, Solar, Wind, and Offshore Wind (OSW) projects in the NYISO Interconnection Queue, looking to identify trends and patterns by zone and in total for the state. The information was obtained from the NYISO Interconnection Website, based on information published on January 20th, and representing the Interconnection Queue as of January 31st. Note that in the Cluster Queue, there are currently 297 projects, totaling 60,884 MW. A total of 79 projects totaling 16,041 MW are listed as having withdrawn.

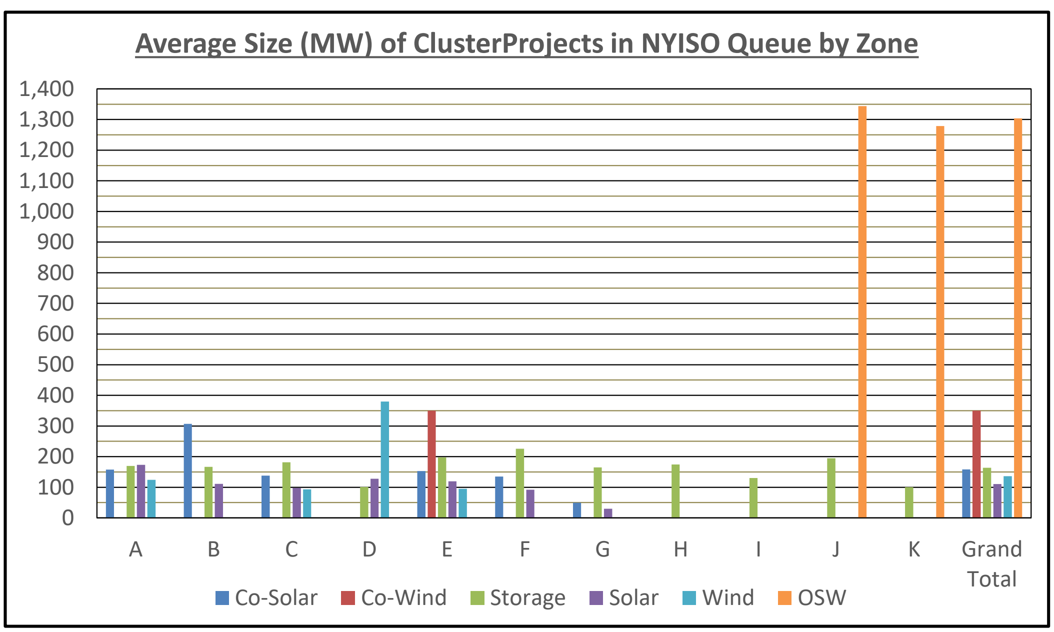
Total Count of Projects in NYISO Queue by Zone						
Zone	Co-Solar	Co-Wind	Storage	Solar	Wind	OSW
A	6		24	5	6	
B	3		3	3		
C	5		27	19	6	
D			7	5	2	
E	9	1	13	12	4	
F	3		16	10		
G	2		34	1		
H			3			
I			1			
J			17			5
K			34			8
Grand Total	28	1	179	55	18	13

Total Project Size (MW) in NYISO Queue by Zone						
Zone	Co-Solar	Co-Wind	Storage	Solar	Wind	OSW
A	947		4,068	865	746	
B	920		500	333		
C	690		4,897	1,861	561	
D			705	640	760	
E	1,378	350	2,569	1,433	380	
F	405		3,609	922		
G	99		5,595	30		
H			524			
I			130			
J			3,309			6,720
K			3,417			10,230
Grand Total	4,439	350	29,322	6,083	2,447	16,950

Average Size (MW) of Projects in NYISO Queue by Zone						
Zone	Co-Solar	Co-Wind	Storage	Solar	Wind	OSW
A	158		170	173	124	
B	307		167	111		
C	138		181	98	93	
D			101	128	380	
E	153	350	198	119	95	
F	135		226	92		
G	50		165	30		
H			175			
I			130			
J			195			1,344
K			101			1,279
Grand Total	159	350	164	111	136	1,304


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


Total Cluster Project Size (MW) in NYISO Queue by Zone
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
A
B
C
D
E
F
G
H
I
J
K
Co-Solar
Co-Wind
Storage
Solar
Wind
OSW


Average Size (MW) of ClusterProjects in NYISO Queue by Zone
1,400
1,300
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
Grand Total
Co-Solar
Co-Wind
Storage
Solar
Wind
OSW