

De-Carbonization / DER Report for NYSRC Executive Committee Meeting 3/12/2021

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The March 2021 edition of the De-Carbonization / Distributed Energy Resources (DER) Report covers an active month of meetings, presentations, and publications at all levels of the regulatory hierarchy. IEEE PES Magazine and EPRI continue their efforts to explore the impacts of renewables on the bulk power system. The month-over-month summary of the Interconnection Queue has been reformatted as a snapshot of the Storage, Solar and Wind projects by Zone, complete with graphics. The topics in this newsletter are covered in the following order:

- NERC Activities:
 - 2020 Annual Report
 - Report on Impacts of Utility Scale Battery Energy Storage Systems on the Bulk Power System
 - SPIDERWG Webinar on FERC Order 2222 focusing on RTOs / ISOs
- NPCC – DER Forum
- NYS DPS – Interconnection Technical Working Group Meeting and JU presentation
- IEEE Power and Energy Magazine – March / April Issue
- EPRI – Public Report: Power Decarbonization - Strategies for Net-Zero CO2 Emissions
- NYISO Public Information Website - Podcasts and blogs covering renewables and DERs
- Snapshot of the NYISO Interconnection Queue: Storage / Solar / Wind

The NERC 2020 Annual Report: This [Report](#) highlights the organization’s achievements over the past year, while presenting a comprehensive summary for its wide-ranging responsibilities, structure and functionality, with links to many recent publications, including the [NERC Long Term Reliability Assessment](#) report, which focused on the impact of DER’s and renewables.

NERC Report on Impacts of Utility Scale Battery Energy Storage Systems on the Bulk Power System

The [Announcement](#) for the publication states that ““North America currently has less than 2 GW of battery storage, but that capacity is projected to increase 100 percent to 4 GW by 2023. The [Report](#) recommends the following:

- System planners should prepare for a significant increase in the critical mass of battery storage. They should also ensure that deployed battery storage provides the necessary essential reliability services to maintain bulk power system reliability, security, and resilience.
- System planners must adequately plan the system for a projected large increase in battery storage, understanding the impact of size, location, and operating characteristics on maintaining the reliable operation of the grid.
- The value of battery storage as a complement to variable energy resources, such as wind and solar, should be fully understood by system planners and operators. Areas include dynamic stability, interconnection impacts, long-term and contingency reserve margins, and reliability services.
- The NERC Reliability and Security Technical Committee (RSTC) should form a task force to study the forward-looking implications of battery energy storage systems and their overall effects on bulk power system reliability and resilience.

NERC SPIDERWG Webinar on FERC Order 2222: This concise [Presentation](#) covers the implications and requirements for utilities, ISO's and RTO's including the concepts of terminology, jurisdictions, tariff provisions, and key provisions. For example, RTO/ISO responsibilities include:

- Distribution factors and bidding parameters for DER aggregations
- Information and data requirements for DER aggregations
- Metering and telemetry requirements for DER aggregations
- Coordination
- Modifications to the list of resources in a DER aggregation, and
- Market participation agreements for DER aggregators.

Coordination Requirements for RTOs/ISOs:

- Must establish market rules that address coordination between relevant entities.
- Must incorporate a comprehensive and non-discriminatory process for timely review by a distribution utility of the individual DERs that comprise a DER aggregation.
- Must establish a process for ongoing coordination.
- Must identify how it will accommodate and incorporate voluntary state and local regulators involvement in coordinating the participation of aggregated DERs in RTO/ISO markets.

Order No. 2222 requires each RTO/ISO to file the tariff changes needed to implement the requirements of the Final Rule by July 19, 2021.

The NPCC DER Forum on Distributed and Variable Energy Resources took place on February 11th. The [Agenda and Material](#) covered an extensive set of topics covered by speakers from the industry, research labs, and NERC, including:

- Offshore Wind Protection System Philosophy (Oersted)
- NPCC Task Force on System Protection (TFSP)
- Advanced Inverter Functions (NREL)
- PRECISE - Pre-configuring and Controlling Inverter Setpoints (SMUD)
- Blackstart using inverter-based resources (NREL)
- Harmonics and power quality (Enernex)
- NERC SPIDERWG Updates and
- NERC IRPTF Battery Energy Storage System and Hybrid Plant Guideline
- NPCC DER Guidance Document

NY State DPS – Interconnection Technical Working Group Meeting (Feb 25th). The main page for the Distributed Generation Information can be found [Here](#). The [Agenda](#) refers to a [Presentation from the Joint Utilities](#) covering the ongoing Smart Inverters Strategic Initiative. This included their latest coordination efforts with the NYISO on recommended BPS Support function settings, ongoing projects within the utilities to explore the capabilities of inverter functions for voltage regulation.

The theme of the March / April Issue of IEEE Power and Energy Magazine (IEEE PES Membership required) is Energy Insecurity. By way of foreshadowing, the first article focuses on Operations Security issues facing ERCOT, due to high renewables penetration, forecasting and market behavior. Other articles focus on:

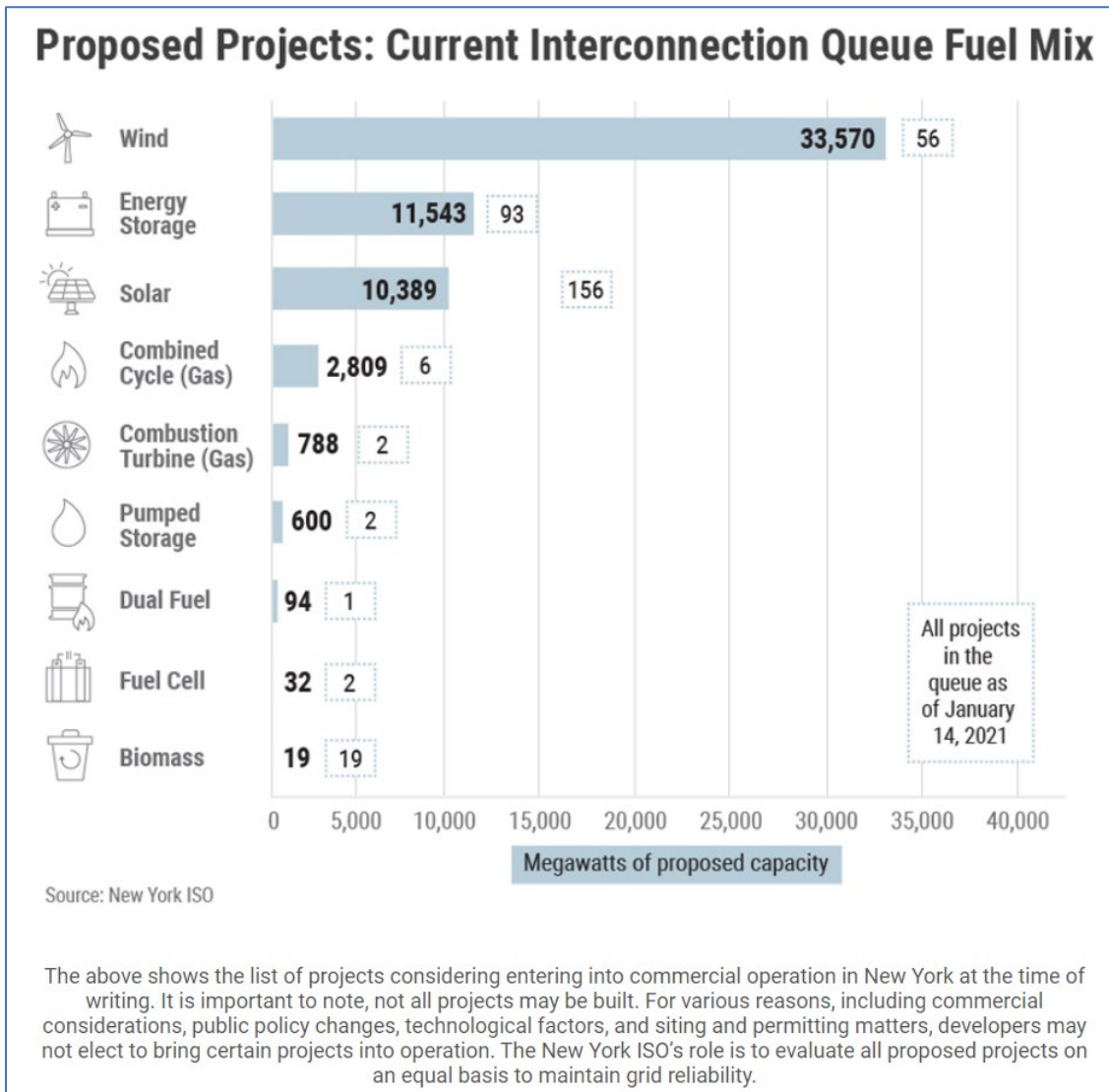
- Energy Security Due to Gas Supply Availability (in California)
- The impact of renewables on Operational Security (In Ireland)
- Energy Security through demand side Flexibility (in Denmark)
- A Vision to Enhance Transmission Security – The case for Switzerland’s Power System
- A Novel Approach to Transmission Bottleneck Management in Japan
- The Fragile Grid – Physics and Economics of Security Services in Low-Carbon Power Systems (Australia)

EPRI – Publicly Available Report: [Power Decarbonization Strategies for Net-Zero CO2 Emissions](#)

This report highlights the technologies and scale of change required to meet zero-emissions targets for the electric sector. Key insights from the analysis include:

- Target definition and timing matter. The generation mix, cost, reliance on emerging technologies, and pace of change vary widely, depending on the definition of the target: Net-Zero, Carbon-Free, or 100% Renewables.
- Solar and wind expand rapidly in all decarbonization scenarios, becoming the largest source of electricity generation by 2035. Actions needed to allow this type of system to operate reliably include rapid grid expansion and modernization, new definitions for reliability, electricity market redesign, new communications and controls for integrating distributed energy resources (DER), and cyber security advances.
- Immediate need for advanced low-carbon, firm capacity to balance solar and wind. 130–380 GW of these technologies— CCS, BECCS, advanced nuclear, and/or clean hydrogen technologies (depending on the scenario)—are used to balance the system by 2035. Negative emissions technologies allow conventional natural gas capacity to play a cost-effective balancing role.
- Low-carbon fuels and carbon dioxide removal needed. Some combination of low-carbon resources, such as clean hydrogen and derivative synthetic fuels as well as bioenergy, potentially including carbon dioxide removal from the atmosphere (by nature-based or engineered solutions), will be essential to achieve net-zero emissions economy-wide.

The [NYISO Public Information Website](#) is accessible from the [NYISO landing page](#) under the “About Us” menu header. From here, visitors can access a wealth of material contained on the [NYISO Blog Page](#), including a series of podcasts and posts, all related to the roles and responsibilities of the NYISO. [The Path to Grid Reliability](#) describes the basic reliability and market functions of the NYISO, while [The Road to 2040](#) represents the start of a new blog series that will provide ongoing news and information covering the impact of renewables, storage and DERs on the NYISO processes. Here is a graphic from that blog, showing the impact of renewables on the Interconnection queue:



Interconnection Queue: Monthly Snapshot - Energy Storage / Wind / Solar Project Tracking

The intent is to track the growth of Energy Storage, Wind and Solar 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 web site](#), based on information published on February 16th, and representing the Queue as of January 31st. The tabulated results on this page are represented graphically on the following page.

Total Project MW in NYISO by Zone			
Zone	Storage	Solar	Wind
A	1,060	2,855	1,698
B	41	925	200
C	759	3,356	960
D	20	727	1,047
E	25	2,586	1,184
F	20	1,660	
G	777	250	
H	1,380		
I	500		
J	2,952		8,976
K	4,285	59	19,742
State	11,819	12,418	33,808

Average Project Size in NYISO Queue by Zone			
Zone	Storage	Solar	Wind
A	106	204	212
B	14	66	200
C	95	93	160
D	20	121	209
E	13	78	118
F	20	42	
G	97	28	
H	460		
I	250		
J	141		1122
K	116		1039
State	123	81	593

Total Project Counts in NYISO Queue by Zone			
Zone	Storage	Solar	Wind
A	10	14	8
B	3	14	1
C	8	36	6
D	1	6	5
E	2	33	10
F	1	40	
G	8	9	
H	3		
I	2		
J	21		8
K	37	2	19
State	96	154	57

