INDEPENDENT INTERVENOR EXHIBIT 5

ULTIMATE RELIABILITY CHALLENGE

Dispatchable Emissions Free Resources

The Scoping Plan, Integration Analysis, New York Independent System Operator (NYISO), New York Department of Public Service, the New York State Reliability Council, and others all have noted[1] that a new category of generating resources called Dispatchable Emissions-Free Resources (DEFR) is necessary to keep the lights on during periods of extended low wind and solar resource availability.

Professor Lindsay Anderson of Cornell University is the first independent analyst to examine the detailed operational performance of the NYS 2040 zero-emission grid strategy as outlined in the CLCPA Scoping Plan. Her team found that even if every item listed in the CLCPA plan is executed, we can expect hundreds of hours of rolling blackouts annually in the downstate region due to spatio-temporal transmission issues if there isn't adequate investment in dispatchable emission-free resources and additional transmission infrastructure[2]. (Reference 1 – Page 8). Dr. Anderson provided the Independent Intervenors with a layman's summary[3] of her work:

Methodology:

The study uses a high-resolution energy system modeling framework that integrates detailed weather data, grid topology, and realistic operational

[1] https://reformingtheenergyvisioninconvenienttruths.com/new-yorks-reforming-the-energy-vision-background-material/dispatchable-emissions-free-resources-page/
[2] https://arxiv.org/abs/2307.15079
[3] Personal Communication, https://pragmaticenvironmentalistofnewyork.blog/wp-content/uploads/2025/06/personal-communication-anderson-to-ellenbogen-13-june-2025-19.pdf

constraints to simulate New York State's future zero-emission electricity grid through hourly operations over decades.

To explore future uncertainties in climate (e.g., temperature rise) and technology (e.g., electrification rates, renewable energy capacity), the model simulates the system's performance across 300 scenarios over a 22-year period. The model incorporates realistic representations of renewable generation, demand from electrified buildings and vehicles, and transmission dynamics, utilizing an enhanced Optimal Power Flow (OPF) approach to evaluate grid reliability under stress. The study measures vulnerability by considering the amount, duration, and intensity of power shortages that would arise in the absence of dedicated DEFRs.

Key Points:

Need for Firm Capacity: The study finds that 60–105% more dispatchable, clean energy resources are needed than previously estimated to ensure reliability. The distribution (location) of these resources throughout the state is a crucial question that requires more detailed studies to estimate accurately. Analysis using daily averages or typical weeks is insufficient to understand the challenge.

Grid Reliability Risks: Simply adding more renewable energy and/or storage isn't enough. Transmission bottlenecks and weather-driven variability can cause power shortages in some regions of the system, while renewables are overproducing in other areas.

Spatial Imbalance: Most renewable energy generation is located upstate, while demand is concentrated in downstate areas (e.g., New York City). This is well known, but the problematic congestion across the state remains unresolved despite the addition of the proposed new transmission lines (CPNY and CHPE), which exacerbates the increased demand due to the electrification of end uses such as buildings and transportation.

Climate Impacts: Rising temperatures and changing weather patterns affect both energy supply (e.g., wind and solar output) and demand (e.g., heating and cooling needs).

Technology Uncertainty: The pace of electrification (e.g., electric vehicles and heating) and the deployment of storage technologies (such as batteries) significantly influence system stability.

Recommendations (high level)

Energy policies must be tested using more detailed technical modeling tools. These plans should be tested against a wide range of future scenarios, using simulations that replicate the detailed operations of the system over long time periods. Informative results require the use of smaller time steps (higher resolution) that align with how the grid is managed and controlled, and the state's geography must be represented in greater detail than the 11 control zones.

Upgrade Infrastructure: Investments in transmission and flexible resources are critical.

The Scoping Plan and the New York Independent System Operator project massive DEFR capacity in 2040 when the New York electric system is supposed to be "zero emissions". According to NYISO's 2023-2042 System & Resource Outlook[4], at least 20 GW of DEFR capacity would be needed by 2040. The September 15, 2023 update to the Integration Analysis[5] projects between 18 and 22GW will be needed in 2040. However, other estimates are higher[6]:

- **Aurora Energy Research**: Approximately 45 GW of flexible generation by 2040, comprised of batteries and peakers or new technologies[7].
- **Form Energy analysis**: 35 GW of long-duration and multi-day energy storage by 2040[8]

The DEFR technologies that Professor Anderson says are necessary to avoid blackouts in the downstate region do not exist at present. The Independent Intervenors believe the most promising DEFR backup technology is nuclear generation because it is the only candidate resource that is technologically ready, can be expanded as needed and does not suffer from limitations of the Second Law of Thermodynamics[9]. If the only viable DEFR solution is nuclear, then renewables cannot be implemented without it. But nuclear can replace renewables, eliminating the need for a massive DEFR backup resource. Furthermore, nuclear has proven to be immensely difficult to site in NY State. Even if a nuclear plant were approved, the advanced nuclear option of SMR (Small Modular Reactor) technology will not be ready to deploy prior to 2035. On June 23, 2025, Governor Hochul "directed the New York Power Authority to develop

[4] https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf
[5] https://climate.ny.gov/Resources/-/media/project/climate/files/IA-Tech-Supplement-Annex-2-Key-Drivers-Outputs-2022-1.xlsx
[6] https://pragmaticenvironmentalistofnewyork.blog/wp-content/uploads/2025/06/dispatchable-emissions-free-resource-capacity-requ.pdf
[7] https://auroraer.com/insight/the-road-ahead-for-nyiso-and-iso-ne/
[8] https://formenergy.com/insights/modeling-multi-day-energy-storage-in-new-york/
[9] https://seam.ly/0H75wo9x

and construct a zero-emission advanced nuclear power plant. Given that the recently completed two large nuclear plants that were built, Vogtle Units 3 and 4, took 13 – 15 years to complete after they were proposed, it is unlikely that new nuclear in New York State will be available until the 2040's at best.

There is no apparent sense of urgency by the PSC to address this requirement. PSC Case 15-E-0302: Clean Energy Standard Implementation addresses DEFR[10] through a comprehensive framework that recognizes the critical gap between renewable energy capabilities and future system reliability needs. A Perplexity AI description[11] of the regulatory framework development in this case states:

Zero Emissions Target Order (May 2023)

The PSC issued an Order Initiating Process Regarding Zero Emissions Target on May 18, 2023, specifically to address the DEFR gap . This order initiated a formal process to identify technologies that can close the gap between existing renewable energy capabilities and future system reliability requirements . Rather than immediately establishing a new CES tier, the Commission sought stakeholder input on options for addressing this critical need .

The order posed 14 specific questions to stakeholders, including how to define "zero emissions" under the CLCPA and whether advanced nuclear, long-duration storage, green hydrogen, and other technologies should be considered . The Commission directed DPS Staff to convene technical conferences to examine these issues and potential solutions .

[10] https://www.perplexity.ai/search/how-does-nys-psc-case-15-e-030-30k0yRiJQ3G0Ssw3sUKtwg#0
[11] Ibid

The Commission's 2025 Biennial Review[12] acknowledges that "the class of resources termed DEFRs currently does not exist as a single specific commercially viable technology option today". Various technologies are in different phases of development, from research and development to potentially becoming viable, scalable market resources[13].

The missing piece in the Order Initiating Process Regarding Zero Emissions Target is a timeline. When will the PSC make a decision how to proceed with DEFR? Studies show that between 18GW and 45GW of an unknown DEFR resource is needed for renewable energy to be safely employed when the electric system is zero emissions in 2040. Despite the lack of a quantifiable reliability metric in PSL 66-p(4), the current approach of building renewables and hoping that a massive new resource will be proven, permitted, and deployed surely meets the intent of PSL 66-p (4) that the PSC should hold a hearing to consider temporary suspension or modification of provisions of the CLCPA because the program impedes the provision of safe and adequate electric service.

The Independent Intervenors believe that the status of DEFR is a clear signal that the current New York State CLCPA implementation plan incorporated into the Con Ed rate case is flawed. We also believe that nuclear will be the most likely DEFR choice. If the only viable DEFR solution is nuclear, then renewables cannot be implemented without it. But nuclear can replace renewables, eliminating the need for a massive DEFR backup resource. Therefore, it

[12] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={F05ED596-0000-CF2F-A3A1-391B4DA423EA}

[13] https://www.nyiso.com/documents/20142/44646498/03f_DRAFT Appendix - Dispatchable Emission Free Resources.pdf/82900cdd-4cf5-eaaa-552a-781e36c87fb4

would be prudent to pause renewable development until DEFR feasibility is proven because nuclear generation may be the only viable path to zero emissions.

Note that the One Gigawatt Nuclear Plant proposed just this week, while a step in the right direction, is much too little and much too late. The 8 Terawatt-hours generated annually will only replace about half of what was lost when Indian Point was shut down by the state. Additionally, based upon lead times for nuclear plants it will not be operational until at least 2040, well past the date when the NYISO says that the state will be suffering from acute energy shortages. Further, by 2040 the existing nuclear plants on Lake Ontario, built between 1970 and 1988. The Ginna nuclear plant will have to close in 2029 without an operating extension. Will the new one gigawatt plant be adding to capacity or just replacing obsolete capacity?