STATE OF NEW YORK

PUBLIC SERVICE COMMISSION

CASES 24-G-0323/24-E-0322

Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Electric Service.

STATEMENT OF

ROGER CAIAZZA AND CONSTANTINE KONTOGIANNIS

IN OPPOSITION TO THE JOINT PROPOSAL

May 14, 2025

PRELIMINARY STATEMENT

Roger Caiazza and Constantine Kontogiannis (Petitioners) hereby submit this Statement in Opposition of the Joint Proposal (JP) filed with the New York State Public Service Commission (Commission) by Niagara Mohawk Power Corporation d/b/a National Grid (Company) and signatory parties in these proceedings on April 25. Petitioners respectfully submit this filing as ratepayers directly impacted by this proceeding and professionals with extensive backgrounds in New York State energy matters.

Petitioners were concerned about the rate case but did not become parties until the April 28 electric grid failure in Spain and Portugal highlighted severe shortcomings of the JP. Specifically, the components of the rate case associated with the Climate Leadership & Community Protection Act (CLCPA) presume that the law's schedule and ambition can be achieved without negatively impacting ratepayer affordability and/or system reliability. However, the incident in Spain and Portugal confirmed that there is ample evidence that CLCPA cannot and will not achieve the former without a substantial detriment to the latter.

Moreover, the environmental benefits claimed by CLCPA also fail to reconcile the lifecycle sustainability impacts of the proposed strategies, many of which advance technologies that are either inappropriate for statewide application,

not mature enough to maintain current reliability norms, or extremely cost prohibitive. The Company and Commission have individually and collectively failed to protect their statutory and regulatory obligations to ratepayers by their failure to identify these obvious issues.

Our concerns regarding CLCPA-related generation and transmission components of the JP include system inertia, long-term storage, ratepayer impact, and environmental benefits, among others. Our CLCPA-related JP concerns centering on consumer loads and local distribution include Company-owned feeder headroom and required upgrades, energy efficiency program design, electrification mandates, low income and Disadvantaged Communities (DAC) measures, ratepayer impact, and environmental benefits, among others.

The rate request filing states that the Company is focused on three priorities: (1) continuing to deliver safe, reliable energy service to its more than two million customers, (2) enabling customers to affordably meet their energy needs while improving the Company's customer service, and (3) supporting the goals of the CLCPA. The Petitioners refer to the greenhouse gas (GHG) emission reduction transition plan described in the CLCPA Scoping Plan[1] as the "CLCPA Electrification Mandate". The Petitioners refer to the "CLCPA Generation Plan" as

[1] https://climate.ny.gov/resources/scoping-plan/

the projected electric grid changes described in the CLCPA Scoping Plan that relies on wind, solar, energy storage, and Dispatchable Emissions-Free Resources (DEFR) resources to achieve the 2040 CLCPA mandate for a zero-emissions electric system.

There are other CLCPA-related elements of the rate case that also endanger public safety and lack sufficient cost transparency. The Petitioners' primary concern is ensuring reliable, affordable, and environmentally responsible service to ratepayers served by the Company, and it is for this purpose alone that we oppose the JP as currently proposed. Simply stated, the goals of CLCPA are in direct contradiction to the statutory and regulatory obligations of the Company and Commission, and of substantial detriment to the ratepayer.

PROCEDURAL HISTORY

On May 28, 2024, the Company filed revised tariffs, supporting testimony, and exhibits for new rates and charges for electric and gas service to be effective July 3, 2024[2]. The new tariffs were designed to increase electric and gas delivery

[2] On June 7, 2024, the Secretary issued a Notice suspending the effective date of the Company's new rates until October 30, 2024. On September 10, 2024, the Secretary issued a Notice further suspending the effective date of the Company's new rates until April 30, 2025, unless otherwise ordered by the Commission. On April 25, 2025, the Commission issued the "Order on Extension of Maximum Suspension Period of Major Rate Filings," further suspending the rates, charges, rules and regulations through July 31, 2025 and finding that the Company "shall be made whole, as defined in th[e] Order, for the period between May 1, 2025, and the date the Commission sets new rates … in these proceedings."

revenues by approximately $525 million and $148 million, respectively, for the 12 months ending March 31, 2026.

The Company filed corrections and updated testimony and exhibits on July 22, 2024, decreasing the electric revenue requirement to approximately $509.6 million and increasing the gas revenue requirement to approximately $156.5 million. On September 26, 2024, 13 parties, including Commission staff, filed direct testimony and exhibits addressing the Company's filing. The Company, Commission staff, and five other parties each filed rebuttal testimony and exhibits on October 18, 2024.

On October 21, 2024, the Company notified the active parties of the commencement of settlement negotiations in these proceedings, pursuant to the Commission's settlement procedures set forth in 16 NYCRR § 3.9, and filed a formal notice of impending settlement negotiations with the Secretary. Settlement negotiations were held from October 30, 2024, to April 15, 2025.

On April 25, 2025, a Joint Proposal ("JP") that would establish a three-year rate plan running from April 1, 2025 through March 31, 2028, was filed by the following parties: Company; trial staff of the New York State Department of Public Service; Multiple Intervenors; Walmart; the Alliance for a Green Economy; the New York Solar Energies Industry Association; Independent Power Producers of New

York, Inc. (IPPNY); the United States Department of Defense and all other Federal Executive Agencies; the New York Geothermal Energy Organization; Turning Stone Enterprises, LLC; Fedrigoni Special Papers North America (Fedrigoni); Empire National Gas Corporation (Empire); New Yorkers for Clean Power; the New York Power Authority (NYPA), and the International Brotherhood of Electrical Workers Local Union No. 97 (IBEW).

STANDARD OF REVIEW

According to the Commission's Settlement Guidelines, "Commission decisions, including those pertaining to proposed settlements, must be, and appear to be, just, reasonable, and in the public interest."[3] The elements considered in determining the "public interest" include:

1. consistency with the law and regulatory economic, social and environmental State and Commission policies;
2. whether the terms of the joint proposal compare favorably with the likely result of a fully litigated case and produce a result within the range of reasonable outcomes;

[3] Cases 90-M-0225 and 92-M-0138, Opinion, Order and Resolution Adopting Settlement Procedures and Guidelines (Mar. 24, 1992).

3. whether the joint proposal fairly balances the interests of ratepayers, investors and the long-term soundness of the utility; and
4. whether the joint proposal provides a rational basis for the Commission's decision.

Additionally, the Commission is guided in their assessment by two additional factors. First, the completeness of the record, and second, whether the settlement is contested.

ARGUMENTS

A. THE JP BURDENS THE RATEPAYERS WITH ADDITIONAL CLCPA-RELATED COSTS THAT SACRIFICE RELIABILITY FOR UNPROVEN SUSTAINABILITY BENEFITS.

Petitioners cite several examples of CLCPA electrification initiatives imposed on Company ratepayers that have created significant cost and reliability safety issues without a tangible environmental benefit.

Cold Climate Air Source Heat Pumps

The Company and NYSERDA have jointly promoted building electrification through the use of heat pumps, but without properly vetting the applicable technologies and host site suitability. To date, over 5,000 residential heat pump

projects have been completed in Company territory[4]. Many of these installations have replaced efficient natural gas-fired equipment, with those ratepayers now subject to substantially higher heating costs that are not nearly offset by program incentives and tax credits[5,6]. Less than 15% of those ratepayers decommissioned their old heating equipment and many of the others likely returned to using it after experiencing the higher operating costs of the heat pumps, negating most of the GHG savings claimed by the program administrators. Moreover, nearly all of the heat pumps installed through this program to date utilize a high global warming potential (GWP) refrigerant that is currently being phased out, which will likely necessitate early replacement instead of routine mid-life servicing.

And while there may be an economic and societal benefit to replacing electric resistance heat predominantly in rural areas with heat pumps, the high cost of implementation has instead encouraged many of these ratepayers to use wood heat, which in turn creates a number of other environmental concerns[7]. Yet rather than seek other cost effective and sustainable options for its ratepayers through targeted natural gas distribution extensions, the JP only provides for the one-size-fits-all electrification path forward, however misguided.

[4] NYS Clean Heat 2024 Annual Report
[5] https://pragmaticenvironmentalistofnewyork.blog/2025/04/02/upstate-new-york-air-source-heat-pump-experience/
[6] https://pragmaticenvironmentalistofnewyork.blog/2025/03/08/peer-review-and-costs-of-building-electrification-for-commercial-users/
[7] https://www.lung.org/clean-air/indoor-air/indoor-air-pollutants/residential-wood-burning

The Company's proposed implementation of a non pipeline alternative (NPA) heat pump initiative in one or more DACs to resolve leak prone pipe (LPP) issues is particularly egregious, since the cost impact is clearly known to the Company and places an added burden on the most vulnerable ratepayers. The Company's proposed solution of a monthly credit merely offsets a portion of the burden to the remainder of the ratepayers, likely resulting in more Energy Assistance Program (EAP) participants. This is what is commonly referred to as a "death spiral".

Geothermal Heat Pumps

While most of the heat pump systems installed throughout the Company service area utilize Cold Climate Air Source technology, a small number utilize geothermal technology. Both the Company and NYSERDA have targeted school districts and higher education facilities for geothermal heat pump systems, even though many of these sites are replacing efficient and cost-effective natural gas heating systems. Consequently, these facilities are experiencing significantly higher operating costs, resulting in a further burden to ratepayers and taxpayers – largely the same group. Many of the host facilities lack adequate seasonal thermal balance necessary to optimize the well field sizing. Moreover, unlike boiler plants that are generally designed for N+1 redundancy, there is no similar cost-effective alternative

for a geothermal well field. System failures attributable to inadequate or improper site investigation, design, construction, maintenance, or other factors often result in catastrophic system failure, facility scheduling impacts, occupant discomfort, and very expensive repair bills[8]. Locally, major geothermal system failures have made the news in the Albany, Niskayuna, and Cobleskill school districts[9]. If the Company or NYSERDA is aware of such reliability issues, it has not publicly stated so.

Perhaps the most disconcerting aspect of the Company's geothermal heat pump initiative is the net sustainability impact, which is negligible when compared to an efficient natural gas heating and air-source cooling alternative, particularly in Upstate New York. The carbon footprint associated with site preparation, well drilling, remediation, and restoration is massive, typically equivalent to more than five years of equivalent natural gas consumption for facility heating and domestic hot water purposes. Moreover, there is a significant and quantifiable GHG impact related solely to the higher capital investment and operating costs. Nowhere in the JP is any type of analysis that reconciles any of the lifecycle heat pump system metrics related to affordability, reliability, or sustainability. This is clearly not in the ratepayer's best interest.

[8] Petitioner Kontogiannis has provided technical assistance for repairs to numerous geothermal projects throughout New York.

[9] https://www.dailygazette.com/news/fixing-niskayuna-high-s-geothermal-system-could-cost-300k/article_14a71b53-ce55-53ce-8200-7d56cf870c71.html

Electric School Buses

While the Company's CLCPA-related heat pump initiatives are an example of inappropriate application of technology that is largely mature, the electric school bus mandate is a more compelling example of the application of technology that is both immature and improper. Locally, the Bethlehem School District has not only experienced dangerous highway breakdowns, but also insufficient battery capacity to operate the afternoon routes in the winter months[10]. Part of the stated justification in spending 2 – 3 times more per vehicle is the reduction in PM emissions, yet these savings could have also been achieved with more affordable and reliable compressed natural gas (CNG) options. In essence, the CLCPA Electrification Mandate forces school districts to use a means of transportation that is less reliable and more costly for the sake of a sustainability benefit that Petitioner Kontogiannis believes to be less than 25% of the amount claimed, once properly accounting for the GHG impacts associated with the vehicle production, charging infrastructure, local distribution upgrades, and lifecycle incremental costs. Even when the technology has matured enough to warrant further consideration, the operational and sustainability benefits are drastically different between an urban school district with a robust electric

[10] https://www.timesunion.com/business/article/recall-repairs-sideline-electric-school-buses-18693379.php

distribution network and frequent bus stops that provide abundant regeneration, compared to a remote rural district with infrequent stops and insufficient grid capacity to support charging infrastructure. The Company has failed to reconcile these considerations in its acceptance of the CLCPA Electrification Mandate as a major component of the JP.

B. THE JP DOES NOT ACKNOWLEDGE NEW YORK PUBLIC SERVICE LAW § 66-P (4)

The rate request filing states that the company is focused on three priorities: delivery of "safe, reliable energy service to its more than two million customers"; enabling customers to "affordably meet their energy needs while improving the company's customer service"; and supporting the goals of the CLCPA. Those priorities are inconsistent because the reliability and affordability acceptability criteria for CLCPA goals have not been defined.

There are criteria for acceptability that have not been acknowledged. New York Public Service Law § 66-p (4) "Establishment of a renewable energy program" includes feasibility safety valve conditions for affordability and reliability that should be considered before the rate case invests in CLCPA projects. Section 66-p (4) states: "The commission may temporarily suspend or modify the obligations under such program provided that the commission, after conducting a hearing as

provided in section twenty of this chapter, makes a finding that the program impedes the provision of safe and adequate electric service; the program is likely to impair existing obligations and agreements; and/or that there is a significant increase in arrears or service disconnections that the commission determines is related to the program".

It is imprudent for the JP to presume that the CLCPA Generation Plan can be affordable and reliable until specific criteria for each provision are defined and a tracking system established to determine if suspension or modification of CLCPA obligations is necessary. The problem with the affordability claim is that it[11] relies upon "creative" accounting schemes that omit the cost of additional transmission lines, backup power generators, overbuilding and curtailment costs, and the additional costs that would be incurred to build and operate equipment like grid forming inverters and synchronous condensers to bolster system inertia and maintain system frequency.

With regards to the reliability claim, New York has two choices. The present path will rely on renewable resources but will require New York to invest heavily in battery storage, grid-forming inverters, synchronous condensers, and new dispatchable emissions-free resources (DEFR) that are currently unavailable. There

[11] https://open.substack.com/pub/energybadboys/p/el-blackout?r=hpo52&utm_campaign=post&utm_medium=email

is another decarbonization approach that is presently disallowed. New York could increase the utilization rates of existing natural gas generators, deploy new combined cycle natural gas generators with carbon sequestration options, and initiate a nuclear power long-term development plan. This is presently unlawful, but it is precisely the kind of thing that could be considered under the temporary suspension and obligation modification provisions in Section 66-P(4) if the Commission makes a finding that the program "impedes the provision of safe and adequate electric service and/or there is a significant increase in arrears or service disconnections" that the Commission determines is related to the CLCPA.

Reliability Safety Valve Considerations

The massive blackout in Spain suggests that a system dependent upon inverter-based resources could have fundamental reliability problems. The CLCPA goal of a zero-emission electric grid requires technology that is not currently available. Attachment 1 describes other reliability planning uncertainties associated with the deployment of wind and solar generating resources.

The Petitioners believe that the PSC should address value judgement issues associated with the safety valve criteria. Should the choice of programs include programs implemented before[12] the CLCPA but that are necessary to achieve the

[12] https://pragmaticenvironmentalistofnewyork.blog/2025/04/14/my-comments-on-the-new-york-affordability-standard/

CLCPA goals? What reliability parameters should be considered and how should significance be defined? Should "significance" be defined relative to the value of the emission reductions for the programs in absolute terms or relative to global emissions? How should programs put into place to directly mitigate overdue bills and service disconnections be considered?

Affordability Safety Valve Considerations

The second Section 66-p(4) criterion of interest is affordability. There isn't a direct affordability metric. Instead, there is an indirect reference using a "significant increase in arrears or service disconnections". Even if there were a direct cost metric, recent information necessary for an adequate assessment of this criterion is unavailable. On May 12, 2022, the Commission issued an "Order on Implementation of the Climate Leadership and Community Protection Act" for Case 22-M-0149. The Order directs[13] DPS Staff to present information on CLCPA costs annually.

On July 20, 2023, DPS Staff presented its "First Annual Informational Report on Overall Implementation of the Climate Leadership and Community Protection

[13] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={5F73F855-B506-41B3-AB05-3CF66F736497}

Act"[14] in compliance with the Commission's Order. It has been nearly two years since that report was published and there has been no update or schedule for releasing the information.

There are data through the end of 2024 that can be used to estimate whether there has been a significant increase in arrears or service disconnections. There is a data set in New York Open Data[15] that provides data that can be used to determine the number of residential customers in arrears. The "Quarterly snapshot of residential collection dataset"[16] contains the following information:

> This dataset provides a quarterly snapshot of residential bill collection activity for New York State's ten largest electric and gas distribution utility companies regulated by the Public Service Commission. Included in this dataset are each utility's total number of residential customers, residential customers with arrears (overdue bills) greater than 60 days, residential final service termination notices issued, residential accounts terminated (service shut off for nonpayment), active residential deferred payment agreements and the number of uncollectible residential accounts. Also included are the

[14] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={20E17489-0000-C114-AD41-8089369DB6F3}
[15] https://data.ny.gov/
[16] https://data.ny.gov/Energy-Environment/Key-Credit-Collection-Beginning-2010/kdjh-dhwi/about_data

corresponding utility sales figures for each metric above, showing the dollar figure represented.

Attachment 3 describes the significance calculation for the number of customers in arrears. Between 2019, the last year before the CLCPA was implemented, and the most recent year there were 202,538 Company customers with arrears greater than 60 days, and at the end of 2024 there were 234,694 customers in arrears which is an increase of 32,156 or 16% increase. The standard deviation of the number of customers in arrears before the CLCPA (from 2010 to 2019) is 12,350. Because the observed difference in the number of customers in arrears in 2019 and 2024 (32,156) is greater than two times the standard deviation the increase is "significant".

New York Public Service Law § 66-p (4) mandates that the finding to temporarily suspend of modify the CLCPA should consider the significance related to the program. Attachment 3 notes that the July 20, 2023, DPS Staff report[17] (Information Report) total Company CLCPA cost recoveries were $352,237,995. The "Quarterly snapshot of dataset"[18] for the 2022 Company residential sales equaled $916,540,809. The CLCPA costs are 38% of the 2022 residential

[17] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={20E17489-0000-C114-AD41-8089369DB6F3}
[18] https://data.ny.gov/Energy-Environment/Key-Credit-Collection-Beginning-2010/kdjh-dhwi/about_data

customer sales. The Commission and the Company should formally determine the amount of residential customer sales that are related to the CLCPA and affect the number of customers in arrears.

The data set used for this evaluation is small and it is not clear how much the CLCPA costs affected the number of customers in arrears, so this significance claim is not strongly supported. Nonetheless the finding that the observed increase in arrears exceeds the New York Public Service Law § 66-p (4) criterion for a significant increase in arrears should trigger a Public Service Commission hearing to determine if it is appropriate to temporarily suspend or modify the obligations of the Climate Act. The Petitioners believe that this fact alone is sufficient reason to exclude all the JP programs that support the goals of the CLCPA.

C. DISPATCHABLE EMISSIONS FREE RESOURCES MUST BE RESOLVED TO ENSURE SAFE AND ADEQUATE SUPPLY

One fundamental flaw in the CLCPA is the mistaken belief by the authors of the law that no new technology would be required. Attachment 2 documents the need for a new technology that the CLCPA authors did not recognize, requirements for this new resource, potential options, and challenges associated with specifying how much capacity and energy will be needed to prevent a reliability crisis that would occur if DEFR is not deployed.

The JP does not consider that a new category of DEFR must be identified, tested, and deployed to provide energy during extended periods of low wind and solar resource availability. Furthermore, because the DEFR technologies have not been identified it is impossible to determine if they are affordable.

Need for DEFR

The New York Independent System Operator 2023-2042 System & Resource Outlook[19] explains that "dispatchable emission-free resources must be developed and deployed throughout New York to support a zero-emissions grid." It goes on: "Specifically, there remains a need for additional supply beyond renewables and storage resources to be dependable during peak demand periods and when the output of renewable resources is low."

Although many other studies have concluded that this resource is needed[20] the CLCPA schedule was based on the presumption[21] that no new technology would be needed to replace fossil-fired generating resources with existing wind, solar, and water technologies. This contradiction is an uncertainty that the JP does not acknowledge.

[19] https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf/8fb9d37a-dfac-a1a8-8b3f-63fbf4ef6167
[20] https://reformingtheenergyvisioninconvenienttruths.com/new-yorks-reforming-the-energy-vision-background-material/dispatchable-emissions-free-resources-page/
[21] https://climate.ny.gov/-/media/project/climate/files/Robert-Howarth.pdf

Potential DEFR Technologies

The New York Independent System Operator 2023-2042 System & Resource Outlook[22] includes Appendix F - Dispatchable Emission-Free Resources.[23] Appendix F describes technology options:

> While DEFRs represent a broad range of potential options for future supply resources, two technology pathways being discussed as potential options for commercialization are: 1) utilization of low- or zero-carbon intensity hydrogen (typically generated by electrolysis derived from renewable generation) in new or retrofit combustion turbine or fuel cell applications or 2) advanced small modular nuclear reactors, which are currently seeking approval from the relevant regulatory bodies to design and operate these resources. Currently, both technologies have shown limited commercial viability on the proof of concept. Even assuming that they are commercially viable, there remains significant work in the implementation and logistics that must be overcome to economically justify transitioning the dispatchable fleet to some combination of new technologies in the next 15 years. Long-duration energy storage could potentially serve in the role of the modeled DEFRs in

[22] https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf/8fb9d37a-dfac-a1a8-8b3f-63fbf4ef6167
[23] https://www.nyiso.com/documents/20142/46037616/Appendix-F-Dispatchable-Emission-Free Resources.pdf/c18e686f-241e-f729-c0fa-ef3c43515bd3

the Outlook. In many respects, long-duration energy storage closely mimics various hydrogen production and conversion pathways. Long-duration energy storage adds to load in many hours, similar to electrolysis production of hydrogen. However, a notable difference is that electrolysis production of hydrogen has a lower round-trip efficiency when injecting energy into the system compared to other long duration energy storage technologies under development.

If "significant work in the implementation and logistics must be overcome to economically justify transitioning the dispatchable fleet to some combination of new technologies in the next 15 years", then there are feasibility concerns that could make the CLCPA Generation Plan approach a dead end.

DEFR Summary

The lack of DEFR is a particular issue for the JP. In our opinion, 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[24]. If the only viable DEFR solution is nuclear, then renewables cannot be implemented without it.

[24] https://seam.ly/0H75wo9x

But nuclear works best as a baseline resource rather than as backup and it can replace renewables, eliminating the need for a massive DEFR backup resource. Therefore, all the JP investments included to support renewable energy development are imprudent because nuclear generation may be the only viable path to zero emissions making all those investments worthless.

D. THE JP DOES NOT PROPERLY CONSIDER ALTERNATIVES TO THE CLCPA GENERATION PLAN THAT PROVIDE SIMILAR ENVIRONMENTAL BENEFITS

In order to maintain adequate system reliability, the CLCPA Generation Plan must include substantial overbuilding of renewable sources and ancillary equipment for inertial grid support. Yet CLCPA fails to consider other options that would largely satisfy its sustainability target without a dramatic ratepayer impact.

In a hypothetical alternative example, the Company must serve a new large customer load near Syracuse with a peak demand of 1 GW and annual energy usage of 7,000 GWh, plus comfort and process heating loads. The CLCPA Generation Plan mandates renewable generation which would consist of a combination of terrestrial wind power and large scale solar, coupled with DEFR (short- and long-duration energy storage) and also inertial stability components such as synchronous condensers and flywheels. The nameplate generation capacity must be oversized by

a factor of 2.5 to account for the relatively low capacity factors of the applied technologies and will generally have a 25-year lifespan with proper maintenance. The DEFR must be capable of supporting long periods of low energy production, up to 750 MW for a period of 100 hours between charging cycles - as well as short-term intermittency. Li-ion batteries have a 10 – 12 year lifespan and the other energy storage components have a 25-year lifespan. The inertial support components are sized to match the maximum coincident output of the renewable generation, and also have a 25-year lifespan.

Although these renewable resources and associated components are commonly claimed to be "carbon free", they in fact have a considerable GHG footprint associated with their manufacture, installation, operation, and decommissioning. In this example, the CLCPA Generation Plan footprint exceeds 30 million metric tons. And based on available cost metrics, the LCOE will exceed $150/MWh[25][26].

By comparison, a current generation Combined Cycle Gas Turbine (CCGT) powerplant with a nameplate rating of 1.25 GW will provide equivalent output with the same or better reliability, but without the need for energy storage or inertial

[25] https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/Offshore-Wind-Solicitations/2023-Solicitation#:~:text=The%20weighted%20average%20all%2Din,with%20the%20latest%20market%20prices.

[26] https://www.eia.gov/outlooks/aeo/electricity_generation/pdf/AEO2023_LCOE_report.pdf

support. Properly maintained, this generator will have a lifespan exceeding 40 years - adjusting to match the same equipment lifespan as the renewable assets described above, the GHG footprint associated with the manufacture, construction, routine O&M, and decommissioning is projected to be less than 5 million metric tons. Applying a similar adjustment for equivalent energy output over a 25-year lifespan, the GHG footprint of the natural gas extracted from Appalachian sources is roughly 130 million metric tons. The LCOE for the CCGT alternative is $50/MWh based on similar projects[27].

At first glance, the net sustainability benefit of the CLCPA Generation Plan is 105 million metric tons. But accounting for just the carbon footprint of the incremental difference in LCOE, the savings drops to 70 million metric tons[28]. If the CCGT facility is co-located with an agricultural park that uses the CO2 from the powerplant to boost productivity[29], the net savings plunges to 10 million metric tons - which is barely 7% of the savings claimed by the CLCPA. Further, if the residual heat is recovered from the CCGT for use by the customer or the agricultural park, this natural gas alternative may even be more sustainable when properly considering all of the lifecycle effects.

[27] https://www.instituteforenergyresearch.org/wp-content/uploads/2019/05/LCOEStudyOnePager.pdf
[28] https://ourworldindata.org/grapher/co2-intensity
[29] https://www.perishablenews.com/produce/houwelings-tomatoes-presented-utah-governors-energy-innovator-of-the-year-award/

There is yet another advantage to the natural gas powerplant option. If new nuclear baseload generation is developed during the operational life of the CCGT powerplant, it can be readily converted to operate on any fuel mixture up to 100% hydrogen, capturing excess renewable production through on-site electrolyzers and providing dual-fuel redundancy for additional grid reliability. While the round-trip efficiency of hydrogen electrolyzers is lower than other options, there is a net sustainability benefit associated with the reuse of an existing generation asset and transmission infrastructure compared to new-build battery energy storage or other DEFR technologies.

The example provided above may not be lawful in New York State but is emerging as a preferred low carbon solution in other areas of the U.S. and abroad[30]. The significant tradeoffs of the CLCPA Generation Plan must be reevaluated by the Company and the Commission as part and parcel of the JP to ensure protection of the ratepayers.

E. PLANNING RISKS

The JP is not in the public interest because it does not consider the uncertain electric planning risks associated with a generating system reliant on weather-dependent resources. Attachment 1 extends the discussion in Attachment 2

[30] https://www.eia.gov/todayinenergy/detail.php?id=54539

concerning the challenges of defining the frequency, duration and intensity of low wind and solar resource availability events and concludes that the associated uncertainties may not be reconcilable.

Electric System Reliability Planning

This argument does not claim to have the answer for electric planning that implements the CLCPA Scoping Plan "zero-emissions" strategies in the Scoping Plan. The intent is to show that the CLCPA Generation Plan is too risky because planning for weather-reliant generating resources cannot address weather variability, be affordable, and prevent an eventual catastrophic blackout.

Attachment 1 describes two reliability planning criteria and the inherent increased risks when the existing system is transitioned to a reliance on weather-dependent resources. The parameters are Loss of Load Expectation (LOLE) and the N-1 Contingency Event.

Loss of Load Expectation

In the future CLCPA Generation Plan resource modeling assessment for LOLE changes significantly. It is important because LOLE is used to determine how much capacity is needed to ensure reliability meets a one day in ten-year standard. Future resource modeling must consider all the outage factors in the

existing system but also must address weather variability. For the most part, current planning does not expect that outage factors will occur at the same time to many facilities. However, in the future that changes because wind and solar resource availability correlates strongly in time and space as shown in Attachment 1.

In the existing system there is no expectation that if the planning horizon is changed that the resource allocations will change appreciably. However, as shown in Attachment 2, when a longer assessment period is used the capacity of weather-dependent resources necessary to be installed increases significantly. If the return period of a low renewable resource event is greater than ten years, then the existing LOLE one in ten-year metric is inadequate.

The unacknowledged problem is that the life expectancy of necessary DEFR backup resources can be less than the weather variability return period. This raises significant affordability concerns because how will a required facility be able to stay solvent when it runs so rarely? It will require large subsidies and very high payments when they do run.

On the other hand, the alternative of ignoring the worst case is unacceptable. In the net-zero future, the electric grid is supposed to rely on wind and solar at the same time heating and transportation are electrified. As a result, the need for reliable electricity is magnified. If we do not provide resources for the observed worst case,

when those conditions inevitably recur, there will be a catastrophic blackout. Electricity will not be available when it is needed the most.

N-1 Reliability Standard

The other relevant reliability standard addresses the need for the system to be able to survive the loss of the largest or most impactful element be it a transmission line, generator, or other major component. This reliability consideration went from a theoretical problem to a mandatory requirement on April 28, 2025 in Spain[31]. Initial assessments indicate that solar power was producing 59% of the electric supply tripped off when there was a disturbance in grid frequency. The CLCPA Generation Plan will have a similar reliance on solar generating and will be vulnerable to the same problem.

Implications

The JP presumes that the CLCPA Generation Plan will maintain current reliability standards. However, observed outages have demonstrated the potential for wind and solar to heighten blackout risks. The Petitioners believe that the grid must be robust enough to survive major contingencies in an imperfect world. The

[31] https://open.substack.com/pub/envmental/p/the-blame-in-spain-falls-mainly-on?r=hpo52&utm_campaign=post&utm_medium=web&showWelcomeOnShare=false

CLCPA Generation Plan model includes unreasonable expectations for future performance. The challenges associated with intermittent resource availability and inverter-based generation are complex and extremely challenging problems that have not received enough attention in the CLCPA transition plan. Worse they are completely ignored by the JP.

The presumption in the JP that the CLCPA Generation Plan will be safe does not stand up to scrutiny. Grid planners recognize that unanticipated adverse events—such as line outages, generator trips, substation failures, and major faults—will continue to impact power grids. Their challenge is to ensure the grid is robust enough to withstand and recover from such disturbances without major consequences. The Petitioners believe that it is unrealistic to expect that the grid planners will be able to anticipate all the additional adverse events that will occur when the electric system depends on weather-reliant resources. It would be prudent to pause the CLCPA projects within the JP until grid planning improves.

BIOGRAPHIES

Petitioner Roger Caiazza has been following the CLCPA since it was first proposed, submitted comments on CLCPA implementation plans, and has written over 500 articles about New York's net-zero transition at his Pragmatic Environmentalist of New York blog. He is an air pollution meteorologist with over 40 years' experience in the electric generating sector.

Petitioner Constantine Kontogiannis is an aeronautical engineer and has 30 years experience in the development of hundreds of generation and efficiency projects, primarily in New York State. He has closely followed CLCPA since inception and testified before the NYS Senate Standing Committee on February 12, 2019 regarding the same net sustainability topics described herein.

The opinions expressed in this statement do not reflect the position of any of our previous employers or any other company we have been associated with, these opinions are ours alone.

CONCLUSION

The Petitioners submit this Statement of Opposition because of our concern that, with its disproportionate efforts to support the goals of the CLCPA, the JP does not properly balance Company and Commission responsibilities to ensure reliable, affordable, and environmentally responsible energy generation and delivery to ratepayers.

With so many legacy hydroelectric and nuclear assets, by all accounts New York State should have some of cleanest, most reliable, and affordable energy in the United States – but we are failing on all counts. Special interests have effectively hijacked what should be a relatively straightforward exercise of prudent engineering - shuttering a critical nuclear asset, denying legacy fossil fuel powerplants permission to repower as CCGT generators, and forsaking cost-effective and fuel-

neutral building and transportation energy efficiency initiatives - all for the well-intentioned but sorely misguided fantasies of climate scientists in academia and policy advocates who have no idea of the complexities involved in the safe and reliable production and delivery of arguably the most essential commodity for the modern world. As if the failure isn't complete, the stated sustainability targets are nothing more than smoke and mirrors – an honest accounting of the lifecycle carbon impacts shows no improvement compared to what solid engineering and standard industry practice afford.

The resulting policy – reflected in this JP – completely disregards the statutory and regulatory obligations of the Company and Commission. The Company's NY Climate Resiliency Plan website[32] states that: "National Grid is committed to urgent action to address climate change as we've outlined in our vision for a fossil free future, but we all must recognize that climate change is no longer a future threat, but a current threat based on the extreme climate hazards we are witnessing today." The Petitioners believe that the crisis facing Company customers is not from the changing climate, but rather the irrevocably flawed climate policy[33].

[32] https://www.nationalgridus.com/Our-Company/New-York-Climate-Resiliency-Plan
[33] Even if CLCPA was to fully achieve its sustainability objectives, the resulting global temperature change is infinitesimally small, see Attachment 3. Petitioners assert that a properly conceived statewide energy plan can achieve essentially the same sustainability target at a much lower cost to ratepayers and with no diminishment of system reliability.

ATTACHMENT 1

RENEWABLE RESOURCE GAP CONSIDERATIONS MUST BE RESOLVED TO ENSURE SAFE AND ADEQUATE SUPPLY

This attachment extends the discussion in Attachment 2 concerning the challenges of defining the frequency, duration and intensity of low wind and solar resource availability events and concludes that the associated uncertainties may not be reconcilable. . The JP presumes that the CLCPA Generation Plan is feasible. However, the fact that there are major uncertainties associated with identifying how much of a required resource is needed means that there are unacknowledged challenges to the presumption that the JP will ensure safe and adequate energy supply.

There are two factors that exacerbate the importance of this issue. The first concern is that the atmospheric high-pressure conditions that cause light winds are also associated with temperature extremes. The hottest and coldest periods are typically the highest load periods when blackouts are most impactful. The second concern is that high-pressure systems can be huge which means that the light wind conditions extend over large areas.

Observed New York Resource Gaps

As noted in Attachment 2 "Dispatchable Emissions-Free Resources" the agencies responsible for New York's electricity system and others agree that extended periods of low renewable resource availability must be addressed. The Iowa Climate Science Education[34] explains that the German term for these low resource episodes is Dunkelflaute or "dark doldrums". Typically, they occur when a large high-pressure system stagnates in one location. In New York there was an eight-day Dunkelflaute event starting on 12 September 2024 hour 0000 and ending on 19 September 2024 hour 2300. During that period[35] the wind capacity of all New York wind energy facilities, including one operational offshore wind farm, was less than 5% of the potential capacity during 96 hours of the eight days (Table 1). That represents 50% of the episode.

[34] https://iowaclimate.org/2024/11/07/the-dunkelflaute-disaster-what-happens-when-wind-power-goes-silent/

[35] https://pragmaticenvironmentalistofnewyork.blog/2024/12/04/september-new-york-dunkelflaute-or-wind-lull/

Table 1: Categorial Hourly Totals for New York State Wind Power from 12 September 2024 hour 0000 to 19 September 2024 hour 2300

Capacity Factor	Capacity	Hours in Category	
(%)	(%)	(n)	(% of period)
5%	<5%	96	50%
10%	<10%	158	82%
15%	<15%	181	94%
20%	<20%	191	99%

Some will argue that because the wind is always blowing someplace that this problem is easily addressed by adding additional transmission to move energy as needed. The Dunkelflaute last fall affected all the New York wind turbines. This is not a localized situation. There is a very high correlation of wind resources in New York[36]. For example, using NYISO resources that provide 2021 wind production[37] and 2021 wind curtailment data[38], the hourly total wind production and curtailments for the entire New York Control Area (NYCA) are shown in Table 2. All the wind resources in the state must be highly correlated if 25% of the time only 7% of the state total wind capacity is available.

[36] https://pragmaticenvironmentalistofnewyork.blog/2024/06/18/personal-comments-submitted-on-the-nys-defr-proceeding/
[37] https://www.nyiso.com/documents/20142/29607069/2021 Hourly Wind Production.xlsx/3aa88145-d5a7-fa2a-cca4-2eac3e8cacef
[38] https://www.nyiso.com/documents/20142/29607069/2021 Hourly Wind Curtailments.xlsx/42239e66-4ab0-cd78-ba5c-df0a80f61711

Table 2: NYISO 2021 Hourly Wind Production at the Aggregated NYCA-Wide Level

Statistic	Production (MW)	Curtailments (MW)	Production % of Total	Curtailment % of Total
Maximum	1,889.9	494.8	86%	25%
99%	1,648.8	198.3	78%	10%
95%	1,329.3	57.5	63%	3%
90%	1,089.4	16.9	52%	1%
85%	930.1	5.9	44%	0%
80%	805.5	1.7	38%	0%
75%	695.6	0.2	33%	0%
70%	601.7	0.0	29%	0%
65%	523.5	0.0	25%	0%
60%	460.0	0.0	22%	0%
55%	401.7	0.0	19%	0%
50%	345.4	0.0	16%	0%
45%	299.3	0.0	14%	0%
40%	257.6	0.0	12%	0%
35%	223.3	0.0	11%	0%
30%	185.7	0.0	9%	0%
25%	151.6	0.0	7%	0%
20%	116.3	0.0	5%	0%
15%	83.6	0.0	4%	0%
10%	51.9	0.0	2%	0%
5%	19.2	0.0	1%	0%
Mean	469.2	9.6	22%	0%

Challenges Defining the Amount of DEFR Required

Appendix 2 notes that the New York Independent System Operator 2023-2042 System & Resource Outlook[39] includes Appendix E "New York Renewable Profiles and Variability"[40]. The data presented in Appendix E show that there are frequent periods when all the CLCPA Generation Plan projected wind and solar resources are expected to provide much lower output than their rated capacity. The New York Independent System Operator (NYISO) is working with its consultant DNV to develop estimates of New York onshore wind, offshore wind, and solar resource availability[41]. Their analysis uses a 23-year historical meteorological database for the New York State renewable resource areas. Initial results based on evaluation[42] of the 23-year database show that there was a 73-hour period when the average land-based wind, offshore wind, and solar resources was less than 10% of their rated capacity.

[39] https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf/8fb9d37a-dfac-a1a8-8b3f-63fbf4ef6167
[40] https://www.nyiso.com/documents/20142/46037616/Appendix-E-Renewable-Profiles-Variability.pdf/76833f16-ca0b-0439-6bae-e45eb75d88fe
[41] https://www.nyiso.com/documents/20142/41314645/06_10430908 DNV LBW and Solar Presentation for NYISO.pdf/9ad3176f-cc96-8f7f-1b32-8fe98e9e095e
[42] https://www.nysrc.org/wp-content/uploads/2024/10/2030_State_Scenario_Longest_Lulls.pdf

The New York State Reliability Council Extreme Weather Working Group[43] (EWWG) analyzed the high-resolution NY offshore wind data[44] provided by NYISO and its consultant DNV for offshore wind resources. The summary of the report stated:

> The magnitude, duration, and widespread geographic impacts identified by this preliminary analysis are quite significant and will be compounded by load growth from electrification. This highlights the importance of reliability considerations associated with offshore wind and wind lulls be accounted for in upcoming reliability assessments, retirement studies, and system adequacy reviews to ensure sufficiency of system design to handle the large offshore wind volume expected to become operational in the next five to ten years.

The NYISO/DNV analysis used a 23-year database. In a similar type of analysis, for the Independent System Operator of New England (ISO-NE) Operational Impact of Extreme Weather Events[45] report, ERA5 reanalysis data[46] were used to prepare a database covering 1950 to 2021. The reanalysis data analysis uses current weather forecast models and historical observations to provide hourly

[43] https://www.nysrc.org/committees/extreme-weather-working-group/
[44] https://www.nysrc.org/wp-content/uploads/2023/07/NYSRC-Wind-Impacts-Final-07_18_2319907.pdf
[45] https://pragmaticenvironmentalistofnewyork.blog/wp-content/uploads/2024/06/iso-ne-operational_impact_of_exteme_weather_events_final_report.pdf
[46] https://rmets.onlinelibrary.wiley.com/doi/10.1002/qj.3803

historical meteorological fields. The data can be further refined to finer scales to project the wind and solar resource availability. The analysis evaluated 1, 5, and 21-day extreme cold and hot events.

One of the important results in the ISO-NE analysis was a table of projected system risk for weather events over the 72-year data record. In the analysis, system risk was defined as the aggregated unavailable supply plus the exceptional demand during the 21-day event. Note that the analysis considered sliding windows for the 21-day events by shifting the 21-day window every seven days. It shows that the system risk increases as the lookback period increases. If the resource adequacy planning for New England only looked at the last ten years, then the system risk would be 8,714 MW, but over the whole period the worst system risk was 9,160 and that represents a resource increase of 5.1%.

Table 3: ISO-NE Operational Impact of Extreme Weather Events with % Differences Top 10 Unique Events (of 1,470)

Rank	21-Day Event Start Date	Avg. System Risk (MW)	% Difference to Max
1	1961-01-22	9,160	
2	1979-02-02	9,005	1.7%
3	1961-01-15	8,899	2.9%
4	1981-01-01	8,719	5.1%
5	2015-02-14	8,714	5.1%
6	2010-07-05	8,696	5.3%
7	1979-07-13	8,685	5.5%
8	1971-01-15	8,665	5.7%
9	1994-01-11	8,660	5.8%
10	1979-02-09	8,656	5.8%

Source: ISO-NE Operational Impact of Extreme Weather Events[47]

[47] https://pragmaticenvironmentalistofnewyork.blog/wp-content/uploads/2024/06/iso-ne-operational_impact_of_exteme_weather_events_final_report.pdf

Finally, there was an EWWG analysis of Historical Weather and Climate Extremes for New York[48] performed by Judith Curry and Roger Caiazza that identified an event in January 1961 as the probable worst-case scenario for New York. There was a 15-day period from January 20 until February 3, 1961, that will likely turn out to be the worst-case cold wave. This was a period when high-pressure systems dominated the weather in the Northeast and those conditions mean light wind speeds.

This comparison of results from different evaluation periods indicates that the longer the evaluations period the more likely that the worst-case event will be discovered. New York has not done an analysis similar to the NE-ISO study that uses 1950 to present data. Until a detailed analysis is completed that evaluates January 1961 then it is likely that we don't know how much energy will be required during the worst-case New York Dunkelflaute. The Petitioners believe the ultimate goal of an evaluation over the longer period would be to define a probabilistic range of return periods for Dunkelflaute events similar to 100-year floods that could be used for electric system planning.

[48] https://www.nysrc.org/wp-content/uploads/2023/06/NY-weather-extremes-rev.pdf

Larger Areas

Some have argued that the wind lull problem can be resolved if sufficient transmission is built to tap into the wind that is always blowing somewhere. To address this presumption, it has been recognized that larger areas need to be treated similarly. The Electric Power Research Institute has a Low-Carbon Resources Initiative[49] that has been looking at resources across the North American continent. If the Table 2 result that all the New York wind resources generate 7% of the state total wind capacity 25% of the time is observed over larger areas, then the presumption that wind lulls can be addressed by transmission is unlikely to be true.

Using data from the data dashboard at the US Energy Information Administration Hourly Electric Grid Monitor[50] it is possible to extend the analysis to the whole country. EIA notes that this is "Hourly total net generation and net generation by energy source for the Lower 48 states." A description of the methodology and limitations is available[51] for the dataset[52] used. The analysis made no attempt to account for the different categories when the data[53] were downloaded.

[49] https://lcri-vision.epri.com/
[50] https://www.eia.gov/electricity/gridmonitor/dashboard/electric_overview/US48/US48
[51] https://pragmaticenvironmentalistofnewyork.blog/2025/02/11/wind-blowing-somewhere-does-not-solve-the-intermittency-problem/
[52] https://pragmaticenvironmentalistofnewyork.wordpress.com/wp-content/uploads/2025/02/us-eia-electric-energy-source-analysis-2025-02-08.xlsx
[53] https://pragmaticenvironmentalistofnewyork.wordpress.com/wp-content/uploads/2025/02/us-eia-electric-energy-source-analysis-2025-02-08.xlsx

Ideally the analysis would include the installed capacity for the different energy sources but only there are only EIA values for solar[54] – 107,400 MW, were found. Figure 1 shows the Maximum Hourly Generation (MW) in 2024 for the primary energy source categories that gives an idea how much capacity is installed for each energy source. Note the maximum solar is 75% of the EIA installed capacity. The expected percentage of installed wind relative to the observed maximum hourly MW would be even less.

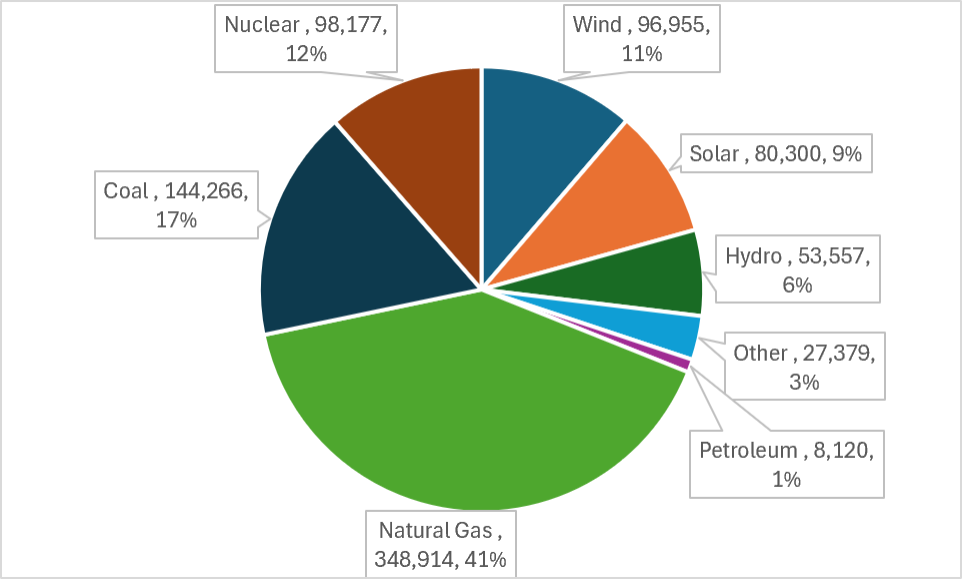


Figure 1: US Energy Information Administration Hourly Electric Grid Monitor 2024 Maximum Hourly Generation (MW)[55]

[54] https://www.perplexity.ai/search/using-us-eia-2024-lower-48-sta-nbRUTOzmQNq0r2UCWdEmVQ

[55] https://pragmaticenvironmentalistofnewyork.wordpress.com/wp-content/uploads/2025/02/us-eia-electric-energy-source-analysis-2025-02-08.xlsx

Figure 2 lists the US Energy Information Administration Hourly Electric Grid Monitor 2024 Total Energy (GWh). It is surprising how much wind energy is generated annually. However, totals and averages are not the primary planning issue – determining how much energy is needed in the worst case is a prerequisite for reliability planning.

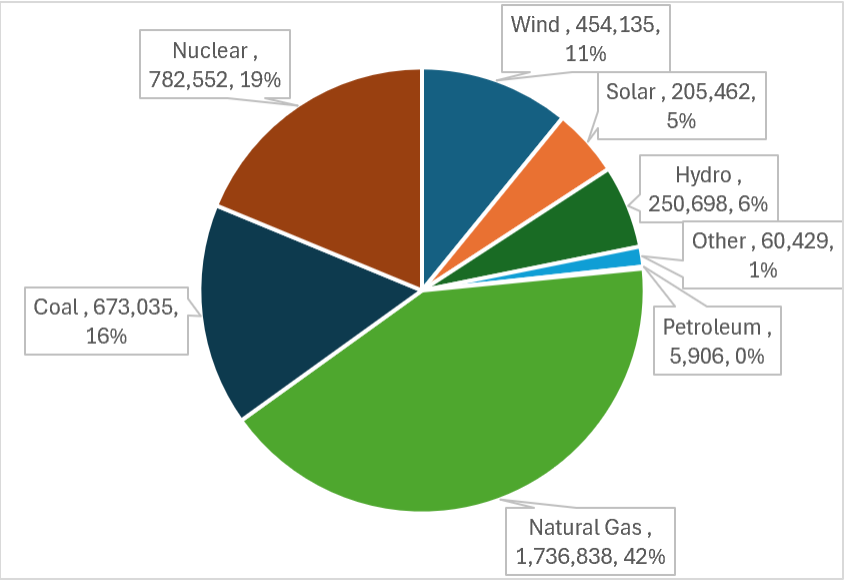


Figure 2: US Energy Information Administration Hourly Electric Grid Monitor 2024 Total Energy (GWh)[56]

Table 4 summarizes nationwide energy source hourly data for 2024. Solar has the most hourly variability because it is unavailable at night. Wind has 95% variability and petroleum that is used for peaking purposes has 99% variability. Only nuclear has less variability than the total energy. Note that while low wind

[56] https://pragmaticenvironmentalistofnewyork.wordpress.com/wp-content/uploads/2025/02/us-eia-electric-energy-source-analysis-2025-02-08.xlsx

capacity is reduced over the country compared to NY, that 10% of the time less than 30% of the maximum wind capacity is available. The Petitioners believe that this indicates the maximizing transmission capabilities would not eliminate the need for DEFR.

Table 4: US Energy Information Administration Electric Grid Monitor 2024 Hourly Data Distribution[57]

Parameter	Units	Wind	Solar	Hydro	Other	Petroleum	Natural Gas	Coal	Nuclear	Total
Total	(GWh)	454,135	205,462	250,698	60,429	5,906	1,736,838	673,035	782,552	4,169,382
Average	(MW)	51,694	23,388	28,537	6,879	672	197,705	76,612	89,078	474,602
Maximum	(MW)	96,955	80,300	53,557	27,379	8,120	348,914	144,266	98,177	736,962
Minimum	(MW)	4,697	-384	10,358	-1,746	42	104,793	39,765	50,730	327,059
1%	(MW)	14,440	-69	13,469	473	153	126,814	43,811	76,167	358,281
5%	(MW)	22,442	-14	16,385	2,143	209	140,130	48,103	77,743	377,240
10%	(MW)	28,455	67	18,381	3,217	278	149,030	51,358	79,109	392,080
15%	(MW)	32,056	161	19,956	4,039	301	155,908	54,070	79,938	404,054
20%	(MW)	35,709	278	21,392	4,661	310	161,565	56,725	81,639	414,999
25%	(MW)	38,981	372	22,771	5,090	318	166,281	59,165	83,883	423,656
50%	(MW)	51,630	12,132	28,180	6,442	369	188,816	72,663	91,297	458,739
75%	(MW)	64,582	46,244	33,774	8,739	724	221,602	90,391	94,371	509,239
90%	(MW)	75,355	63,574	38,993	11,073	1,433	262,588	109,404	95,656	587,096
95%	(MW)	80,548	68,833	42,440	12,277	2,038	287,646	121,281	96,393	631,880
99%	(MW)	87,634	74,702	47,746	14,341	3,830	321,157	135,993	97,904	681,505
Range	(%)	95%	100%	81%		99%	70%	72%	48%	56%

There was no map of wind energy facilities at the EIA website to show the location of wind facilities. Synapse Energy[58] has developed an interactive map of U.S. power plants, including wind facilities which is shown as Figure 3.

[57] https://pragmaticenvironmentalistofnewyork.wordpress.com/wp-content/uploads/2025/02/us-eia-electric-energy-source-analysis-2025-02-08.xlsx
[58] https://www.synapse-energy.com/tools/interactive-map-us-power-plants

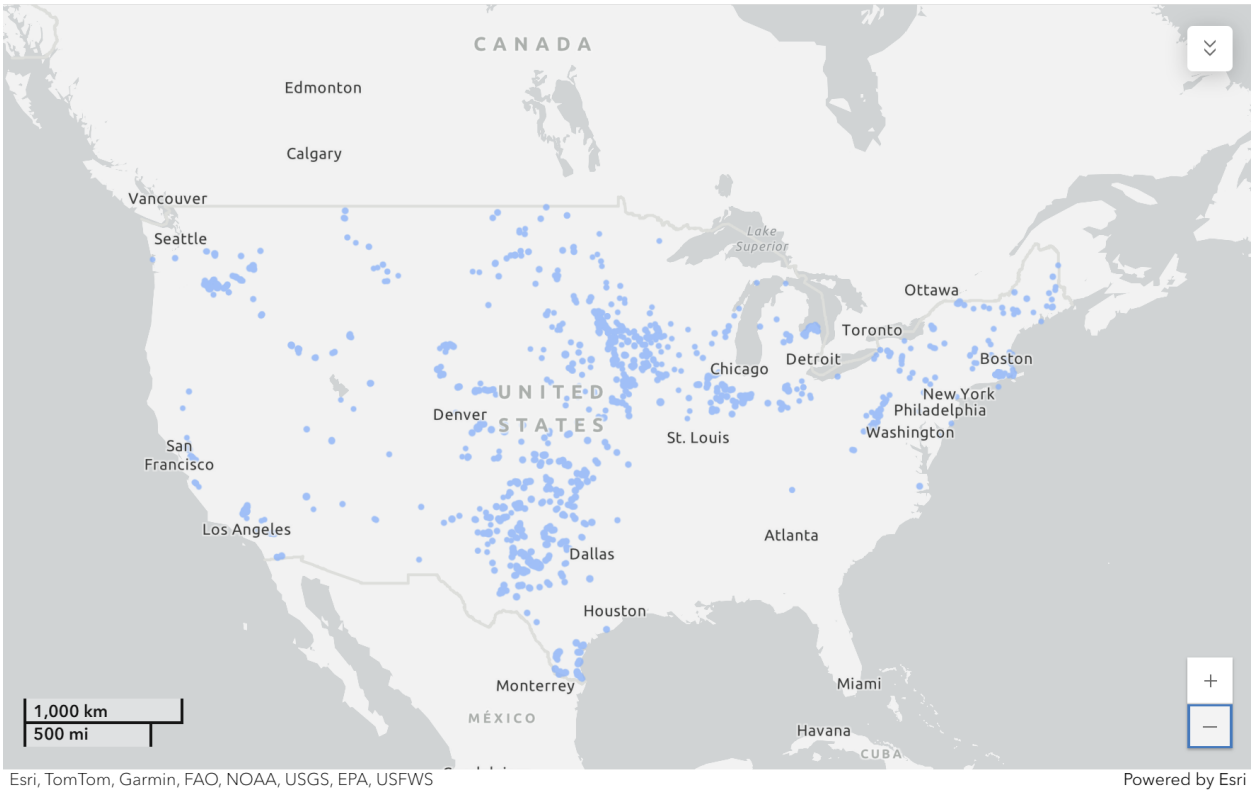


Figure 3: Synapse Energy Map of U.S. Wind Power Plants[59]

Assuming that the EIA wind energy facilities are similar to those used by Synapse Energy, there is a wide spatial distribution across the Lower 48. Consider that if a wind lull in New York City was caused by a high-pressure system that covers everything east of the Mississippi that transmission committed to dedicated wind turbines 1,000 miles away would be required to ensure that New York State wind energy could be supplied by wind elsewhere. Obviously, that is not feasible.

Table 5 provides an estimate of wind lulls at different thresholds. The hourly data evaluated to determine the total available wind energy (GWh) available when

[59] https://synapse.maps.arcgis.com/apps/dashboards/201fc98c0d74482d8b3acb0c4cc47f16

the total available wind capacity was less than six percentile thresholds. At the first percentile only 14,440 MW or less was generated. This level is 15% of the maximum observed hourly wind capacity. There were 14 episodes that met this threshold and total energy generated during those periods was 988 GWh.

From a planning standpoint the maximum duration is important. There was a 14-hour period when all the Lower 48 wind facilities produced less than 15% of the maximum observed capacity and the total energy generated was only 29 GWh which is only 2% of the capability over that period. At the 25th percentile, all the wind facilities produced 40% of the maximum observed capacity. There were 180 episodes that met this threshold and total energy generated during those periods was 63,430 GWh. For the maximum duration there was a 115-hour period when all the Lower 48 wind facilities produced less than 40% of the maximum observed capacity and the total energy generated was 2,319 GWh which is 21% of the capability over that period.

Table 5: US EIA Electric Grid Monitor 2024 Hourly Wind Lulls

		Total		Maximum	
	Capacity (MW)	Energy (GWh)	Episodes (N)	Energy (GWh)	Length (N)
Maximum	96,955				
1%	14,440	988	14	29	14
5%	22,442	7,515	52	1,045	67
10%	28,455	18,749	85	1,553	88
15%	32,056	32,085	125	2,039	112
20%	35,709	46,970	145	2,243	113
25%	38,981	63,430	180	2,319	115

This analysis shows that it is necessary to extend the area covered to determine the amount of New York DEFR capacity and energy needed when the North American grid is all "zero emissions" electricity relying on wind and solar generation. Failure to do so is an added uncertainty that increases the risk that the CLCPA Generation Plan approach incorporated in the JP is not feasible.

Climate Variability

As noted, New York has not evaluated Dunkelflaute events over the 75-year period 1950 to the present when adequate meteorological data are available to estimate wind and solar resource availability. This is necessary to estimate how much energy would be needed for the DEFR technologies to replace. However, an analysis over that time frame only addresses weather variability and cannot address climate variability over periods greater than 75 years or the effects of climate change.

Roger Pielke, Jr. described the underappreciated importance[60] of climate variability in a recent post. One of the frustrating characteristics of climate advocates is the constant attribution of any unusual weather to climate change.[61] Roger Pielke, Jr. provides nuance and detail to the question[62] "what is climate change."

> One of the most pervasive misunderstandings of climate — even among some who publish on climate — is the belief that any long-term trend in a measured climate variable indicates a change in climate, as defined by the Intergovernmental Panel on Climate Change (IPCC}. In practice, "long-term" is often defined to be only a few decades worth of observations. Some trends in observational data are not an indication of a change in climate, and others are — telling the difference is not easy when it comes to extreme weather events.

Pielke explains why this should be considered when estimating climate change effects:

[60] https://open.substack.com/pub/rogerpielkejr/p/the-underappreciated-importance-of?r=hpo52&utm_campaign=post&utm_medium=email
[61] https://pragmaticenvironmentalistofnewyork.blog/climate-leadership-and-community-protection-act/climate-leadership-and-community-protection-act-weather-vs-climate-page/
[62] https://open.substack.com/pub/rogerpielkejr/p/the-underappreciated-importance-of?r=hpo52&utm_campaign=post&utm_medium=email

The IPCC AR6 explains[63] that the detection of a change in climate requires some certainty that the trend is not simply due to climate variability: "An identified change is detected in observations if its likelihood of occurrence by chance due to internal variability alone is determined to be small, for example, <10%."

Quantifying internal variability with respect to any climate metric is challenging, typically with multiple valid interpretations possible. Superimposed upon the challenge is the fact that internal variability itself has been influenced by human factors, notably the emission of greenhouse gases.

Pielke's post goes on to address the question "How near or far into the past does one need to go to adequately characterize a 'current climate'?" to use as the baseline for a climate change comparison. He uses flood data for various periods to show how easy it is to find a "convincing" trend showing larger floods over time since 1897 consistent with the hypothesis that increased greenhouse gases are causing the increase based on the data used. However, when data prior to 1897 Hirsch (2011)[64] explain that:

[63] https://apps.ipcc.ch/glossary/
[64] https://doi.org/10.1111/j.1752-1688.2011.00539.x

> . . . we get a very different and more complex picture. . . Now we would say that although there has been some increase in flood magnitudes over time, the pattern is no longer very consistent with a hypothesis that this is driven by greenhouse gas increases in the atmosphere. The high values in the 19th Century are inconsistent with this hypothesis. In fact, one could put forward the argument that there are two populations of annual floods at this location. One is the population that spanned the years of about 1900 to 1941, and the other population existed before 1900 and after 1942. Without the benefit of the longer record, we could easily conclude that the data were highly supportive of a greenhouse-gas driven trend in flood magnitudes, but with it we find ourselves having to entertain other highly plausible hypotheses about an abruptly shifting population, with shifts that take place at time scales of many decades. The data do not negate the possibility that greenhouse forcing is a significant factor here, but they make it much more difficult to argue that these data provide a clear demonstration of the effect of enhanced greenhouse gas forcing on flood magnitudes.

Pielke goes on to describe how this issue affects the US government's approach to flood policy. He notes that a common application of flood risk fails to

account for this problem. This challenge has been long recognized by flood experts. Leslie Bond[65] described this 20 years ago:

> In the statistical estimation of a flood peak of a specific recurrence interval requires that all of the recorded peak flows be accurate and that the record be stable over the period of the record and the period for which the estimate is to be applied. That is, if there is a 50-year record of stream flow from 1931 through 1980, and you want a current estimate of the 1% flood to be valid for 30 years, the hydrology, the meteorology and the hydraulics must be stable from 1930 through 2034. In fact, we do not have sufficient historic rainfall data to be sure that the meteorology is stable, and few watersheds in the world are not changing as a result of urbanization, deforestation, agriculture, grazing or other causes.

The issues described by Pielke related to long-term weather observations are relevant to wind and solar resource availability for specifying DEFR capacity. It is obvious that we need to know the worst-case scenario for low wind and solar resource availability to determine how much long-term storage and/or some magical dispatchable emissions-free resource is needed to provide sufficient energy during

[65] http://chrome-extension/efaidnbmnnnibpcajpcglclefindmkaj/https:/biotech.law.lsu.edu/blog/nrcs143_009401.pdf

resource droughts. His references to floods are apropos. We need to develop a probabilistic renewable resource drought parameter equivalent to the 100-year flood.

Pielke's analysis shows that using as long a period of data as possible to determine a probabilistic assessment is necessary but not sufficient to remove uncertainty. These results complicate wind and solar-depending electrical system planning because it means even using the longest period of data may be insufficient. Also note that we apparently must worry about not just storage but also whatever weather conditions that cause extreme inertial frequency fluctuations that can lead to blackouts like in Spain.

The ultimate issue with the JP is that electrical planners currently base their reliability projections based on decades of experience with power plant outages that are uncorrelated. Planners have a good handle on the failure probabilities and how much installed reserve capacity is needed as backup. In the future the reliability requirements for wind and solar resource availability will be driven by weather that is fickler than plant shutdown variability. In addition, this variability correlates over large areas so many of the wind and solar resources will behave the same.

The Petitioners believe that the likelihood of exceeding the planning parameters is much greater for the weather dependent CLCPA Generation Plan than today's grid. When the CLCPA Electrification Mandate is in place and everybody

and everything possible is electrified, and the resource drought planning criteria are exceeded, the results will be catastrophic.

Summary

The JP presumes that the CLCPA Generation Plan is feasible so that investments in CLCPA goals are appropriate. This attachment shows that there are major uncertainties associated with the current assessment of DEFR resource requirements. New York has not projected the potential need for DEFR using the longest period of data available. It is also necessary to expand the area covered in such an analysis so that the potential for imports from outside New York can be determined. Even if an analysis were completed for the longest meteorological data set over the North American continent, it is not possible to address natural climate variability.

Recently, Russ Schussler (a retired electric planning engineer) argued[66] that the intermittency issue addressed here might be solvable: "The long-term problems associated with wind and solar due to their intermittency could and may likely be made manageable with improved technology and decreasing costs." The Petitioners not that practically speaking it may not be possible. It would be necessary to upgrade

[66] https://wattsupwiththat.com/2025/02/01/how-the-green-energy-narrative-confuses-things/

the electric transmission system, deploy short-term storage, and develop and deploy a dispatchable emissions-free resource all to address short and infrequent periods and to somehow finance those resources with those constraints.

Importantly, even if intermittency can be addressed Schussler argues[67] that there is a fatal flaw:

> Overcoming intermittency though complex and expensive resource additions at best gets us around a molehill which will leave a huge mountain ahead. Where will grid support come from? Wind, solar and batteries provide energy through an electronic inverter. In practice, they lean on and are supported by conventional rotating machines. Essential Reliability Services include the ability to ramp up and down, frequency support, inertia and voltage support. For more details on the real problem see this posting. "Wind and Solar Can't Support the Grid"[68] describes the situation and contains links to other past postings provide greater detail on the problems.

It is incumbent upon the Company and PSC to prove that these issues can be addressed such that safe, affordable, and affordable electricity is feasible in the CLCPA Generation Plan weather-dependent strategy. Until a feasibility analysis is complete, it is inappropriate to include CLCPA-related costs in the rate case.

[67] Ibid
[68] https://judithcurry.com/2024/12/05/wind-and-solar-cant-support-the-grid/

ATTACHMENT 2

DISPATCHABLE EMISSIONS FREE RESOURCES MUST BE DEPLOYED TO ENSURE SAFE AND ADEQUATE SUPPLY

One fundamental flaw in the Climate Leadership & Community Protection Act (CLCPA) is the mistaken belief by the authors of the law that no new technology would be required. Climate Action Council member and CLCPA Author[69] Robert W. Howarth, Ph.D., the David R. Atkinson Professor of Ecology & Environmental Biology at Cornell University, described this position in his statement[70] approving the Draft Scoping Plan:

> A decade ago, Jacobson, I and others laid out a specific plan for New York (Jacobson et al. 2013)[71]. In that peer-reviewed analysis, we demonstrated that our State could rapidly move away from fossil fuels and instead be fueled completely by the power of the wind, the sun, and hydro. We further demonstrated that it could be done completely with technologies available at that time (a decade ago), that it could be cost effective, that it would be hugely beneficial for public health and energy security, and that it would stimulate a

[69] https://news.cornell.edu/stories/2019/07/howarth-advised-methane-portions-nys-new-climate-law
[70] https://climate.ny.gov/-/media/project/climate/files/Robert-Howarth.pdf
[71] http://web.stanford.edu/group/efmh/jacobson/Articles/I/NewYorkWWSEnPolicy.pdf

large increase in well-paying jobs. I have seen nothing in the past decade that would dissuade me from pushing for the same path forward.

This attachment explains why this position is incorrect. It documents the need for Dispatchable Emissions-Free Resources (DEFR), explains the requirements for this new resource, describes potential options, and notes the challenges associated with specifying how much capacity and energy will be needed to prevent a reliability crisis.

The JP does not adequately address the fact that a new category of Dispatchable Emissions-Free Resources (DEFR) must be identified, tested, and deployed to provide energy during extended periods of low wind and solar resource availability. There is a very real chance that nothing will be feasible. Furthermore, because the DEFR technologies have not been identified it is impossible to determine if they are affordable.

DEFR Requirement

A PSC technical conference in December 2023[72], the CLCPA Scoping Plan[73], the New York Independent System Operator (NYISO) 2023-2042 "System &

[72] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A0AE368C-0000-C039-83A3-3D617797E8F4}
[73] https://climate.ny.gov/Resources/-/media/project/climate/files/Appendix-G.pdf

Resource Outlook"[74], the New York Department of Public Service (DPS) Proceeding 15-E-0302,[75] and others[76] all have noted that DEFR is needed to provide adequate electricity support during periods of extended low wind and solar resource availability. The NYISO 2021-2040 System Resource Outlook[77] states:

> DEFRs that provide sustained on-demand power and system stability will be essential to meeting policy objectives while maintaining a reliable electric grid. While essential to the grid of the future, such DEFR technologies are not commercially viable today. DEFRs will require committed public and private investment in research and development efforts to identify the most efficient and cost-effective technologies with a view towards the development and eventual adoption of commercially viable resources. The development and construction lead times necessary for these technologies may extend beyond policy target dates.

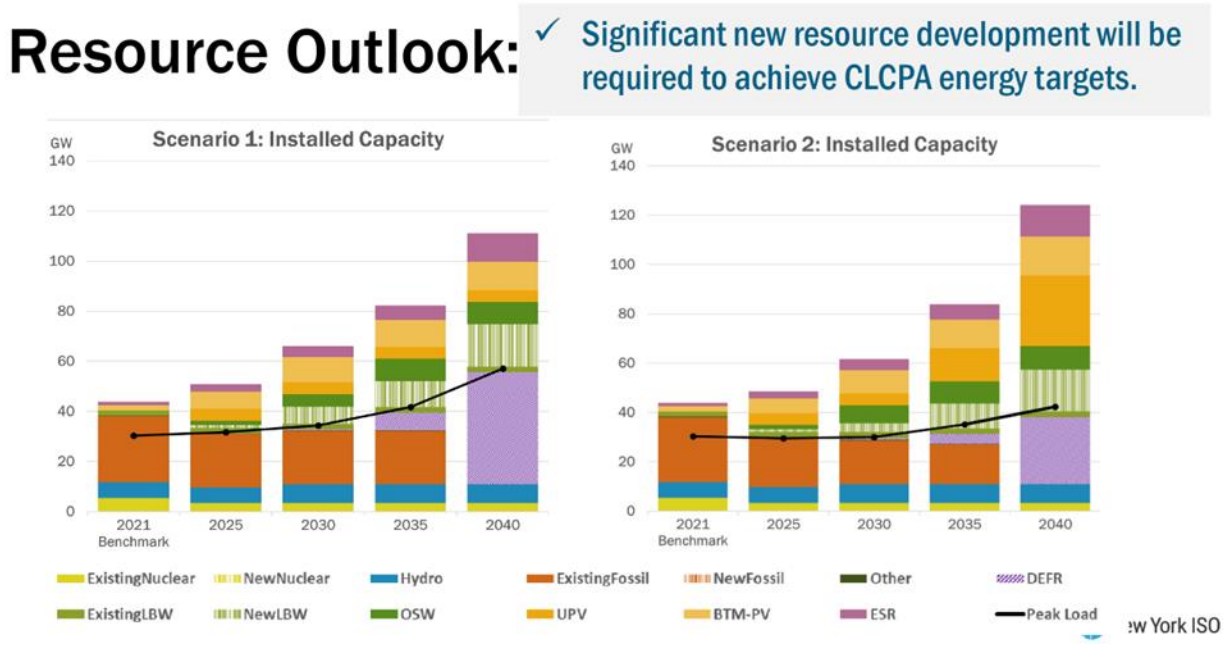
[74] https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf/8fb9d37a-dfac-a1a8-8b3f-63fbf4ef6167
[75] https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Mattercaseno=15-E-0302
[76] https://reformingtheenergyvisioninconvenienttruths.com/dispatchable-emissions-free-resources-page/
[77] https://www.nyiso.com/documents/20142/33384099/2021-2040-Outlook-Report.pdf/a6ed272a-bc16-110b-c3f8-0e0910129ade?t=1663848437588

The New York Independent System Operator 2023-2042 System & Resource Outlook[78] includes Appendix F - Dispatchable Emission-Free Resources[79] that describes the reason DEFR is needed: "Numerous studies have shown that a system comprised of intermittent renewable energy resources and short-duration storage (i.e. 4 and 8-hour capacity duration) that cycle daily can economically meet demand in most hours across a year."

NYISO Vice-President Zachary Smith gave an overview summary presentation of the DEFR issue that is included in the conference slide deck[80]. His description[81] of the first slide (shown below) gave an overview of the generating resource outlook to make the point that a large amount of new generating resources needs to be developed. The estimates shown are from the 2021-2040 System & Resource Outlook[82] and represent two plausible load projections. He noted that there are "a lot of attributes that fossil fuel resources provide today that wind, solar, and energy storage simply cannot provide". He also made the point that the DEFR

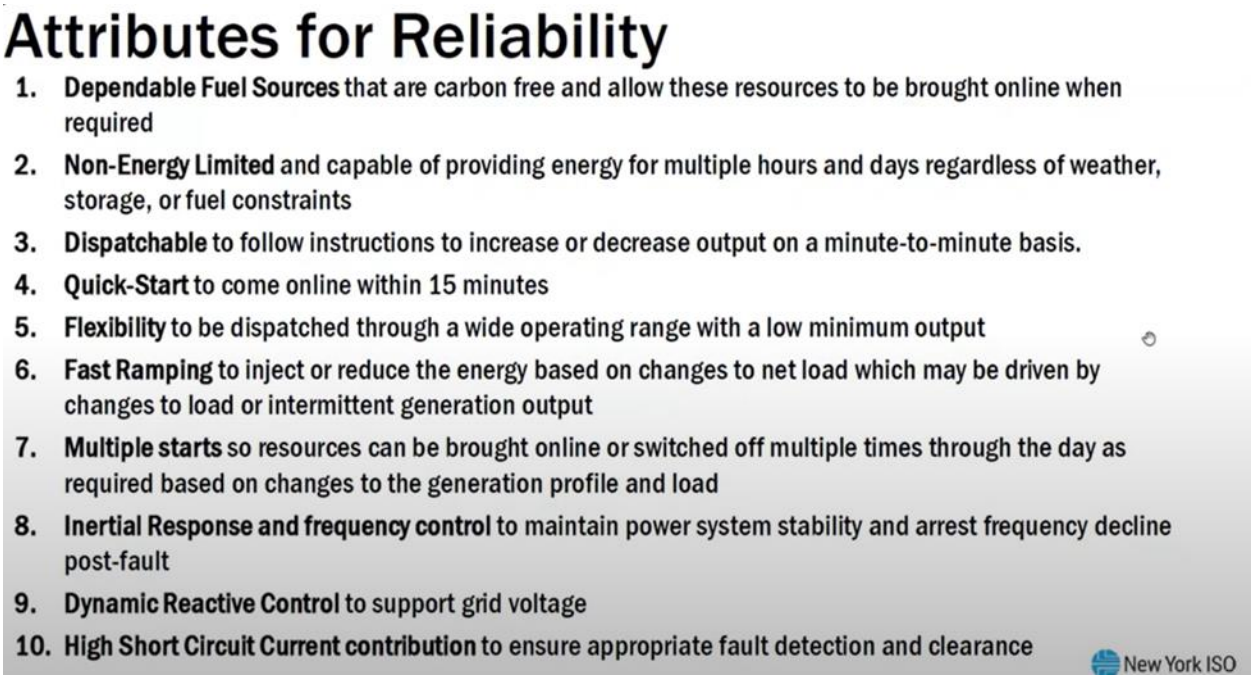
[78] https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf/8fb9d37a-dfac-a1a8-8b3f-63fbf4ef6167
[79] https://www.nyiso.com/documents/20142/46037616/Appendix-F-Dispatchable-Emission-Free Resources.pdf/c18e686f-241e-f729-c0fa-ef3c43515bd3
[80] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A0AE368C-0000-C039-83A3-3D617797E8F4}
[81] https://youtu.be/H8cDf0bRetQ?t=2194
[82] https://www.nyiso.com/documents/20142/33384099/2021-2040-Outlook-Report.pdf/a6ed272a-bc16-110b-c3f8-0e0910129ade?t=1663848437588

replacements do not have to be a single technology but could be several technologies that in aggregate can replace the fossil generation.



Smith also listed the attributes[83] needed by DEFR in his presentation.

[83] https://youtu.be/H8cDf0bRetQ?t=2501



Smith's presentation described[84] the attributes of twelve sample technologies. This represents the NYISO opinion of the capability of different technologies to meet the attributes necessary to maintain a reliable system. In the future grid the insistence that all fossil fired units must be shut down means that numerous technologies that meet some of the necessary attributes will be required. The added complexity of these technologies does not increase resiliency because wind, solar, battery and demand response are all energy limited. Ancillary support services will be a major consideration because wind, solar and battery do not provide those services. From this overview, it is clear that affordability and reliability will be challenges in the CLCPA Generation Plan.

[84] https://youtu.be/H8cDf0bRetQ?t=2753

Attributes of Sample DEFR Technologies

		2023 NYCA Summer Capacity (MW)	Energy Attributes						Other Reliability Attributes			
			Carbon Free	Dependable Fuel Source	Non-Energy Limited	Dispatchable	Quick Start	Flexible	Multi Start	Inertial Response	Dynamic Reactive Control	High Short Circuit Current
Sample Technology	Fossil	25,667	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Hydro	4,265	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Pumped Storage	1,407	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Hydrogen Fuel Cell	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
	Hydrogen Combustion	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Nuclear	3,305	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes
	Modular Nuclear	0	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes
	Battery	0	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No
	Solar	154	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No
	Wind	2,051	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No
	Demand Response	1,234	Yes	Yes	No	No	No	Yes	No	No	No	No
	Synchronous Condenser	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes

Potential DEFR Options

Appendix F[85] in the Outlook evaluates three DEFR options that the NYISO believe represent the most likely viable approach but concede that there still are concerns even with these:

> While DEFRs represent a broad range of potential options for future supply resources, two technology pathways being discussed as potential options for commercialization are: 1) utilization of low- or zero-carbon intensity hydrogen (typically generated by electrolysis derived from renewable generation) in new or retrofit combustion turbine or fuel cell applications or

[85] https://www.nyiso.com/documents/20142/46037616/Appendix-F-Dispatchable-Emission-Free Resources.pdf/c18e686f-241e-f729-c0fa-ef3c43515bd3

2) advanced small modular nuclear reactors, which are currently seeking approval from the relevant regulatory bodies to design and operate these resources. Currently, both technologies have shown limited commercial viability on the proof of concept. Even assuming that they are commercially viable, there remains significant work in the implementation and logistics that must be overcome to economically justify transitioning the dispatchable fleet to some combination of new technologies in the next 15 years. Long-duration energy storage could potentially serve in the role of the modeled DEFRs in the Outlook. In many respects, long-duration energy storage closely mimics various hydrogen production and conversion pathways. Long-duration energy storage adds to load in many hours, similar to electrolysis production of hydrogen. However, a notable difference is that electrolysis production of hydrogen has a lower round-trip efficiency when injecting energy into the system compared to other long duration energy storage technologies under development.

The Petitioners believe that 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[86]. If the only viable DEFR solution is nuclear, then renewables cannot be implemented without it. But nuclear operates best as a baseload resource and can replace renewables, eliminating the need for a massive DEFR backup resource. Therefore, it would be prudent to pause renewable development and stop including renewable development projects needed for the CLCPA Generation Plan until DEFR feasibility is proven because nuclear generation may be the only viable path to zero emissions. If that is the case. then the renewable investments are redundant and unnecessary.

Challenge Defining the Amount of DEFR Required

The New York Independent System Operator 2023-2042 System & Resource Outlook[87] also includes Appendix E "New York Renewable Profiles and Variability"[88]. The data presented in Appendix E show that there are frequent periods when all the wind and solar resources are expected to provide much lower output than their rated capacity. Initial results show that there was a 36-hour period when land-based wind, offshore wind, and solar resources were each less than 10% of their rated capacity. At the September 27, 2024 New York State Reliability

[86] https://seam.ly/0H75wo9x
[87] https://www.nyiso.com/documents/20142/46037414/2023-2042-System-Resource-Outlook.pdf/8fb9d37a-dfac-a1a8-8b3f-63fbf4ef6167
[88] https://www.nyiso.com/documents/20142/46037616/Appendix-E-Renewable-Profiles-Variability.pdf/76833f16-ca0b-0439-6bae-e45eb75d88fe

Council (NYSRC) Extreme Weather Working Group (EWWG) meeting[89], Thomas Primrose from PSEG Long Island presented a refined analysis of these data. Among other things, his evaluation[90] found that when New York solar, onshore wind, and offshore wind capacity were averaged the hours meeting the less than 10% criterion doubled to a 73-hour period.

For context consider that Attachment 1 shows that if the renewable resources projected in the Integration Analysis, without any fossil-fired resources, were operating over those 73 hours that there would have been a cumulative generation deficit of up to 103,465 MWh within the lull. Note that the lull deficiency projection length is dependent upon the location of the solar and wind facilities, so this is an approximation. Nonetheless, it suggests that specifying the amount of DEFR needed is challenging. Attachment 1 extends the discussion of this key challenge.

Summary

The Petitioners believe the requirement for DEFR is the major reliability risk of the CLCPA Generation Plan zero-emissions electric grid by 2040 target. DEFRs must be developed and deployed at scale well before 2040 to ensure reliability and meet climate mandates. They are not commercially viable today and the Department of

[89] https://www.nysrc.org/committees/extreme-weather-working-group/extreme-weather-working-group-schedule-and-meeting-page/
[90] https://www.nysrc.org/wp-content/uploads/2024/10/2030_State_Scenario_Longest_Lulls.pdf

Public Service (DPS) Proceeding 15-E-0302[91] has no schedule to address the mandates in the May 18, 2023 Order Initiating Process Regarding Zero Emissions Target[92]. That Order initiated a process[93] to "identify technologies that can close the gap between the capabilities of existing renewable energy technologies and future system reliability needs, and more broadly identify the actions needed to pursue attainment of the Zero Emission by 2040 Target." In the absence of this guidance, it is absurd to expect that National Grid could address the potential impacts of this requirement on the rate case. Nonetheless, National Grid has an obligation to provide safe and reliable electricity to its customers, and they must understand the risks of the CLCPA Generation Plan. That understanding is not reflected in the JP.

[91] https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Mattercaseno=15-E-0302
[92] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={00E12F88-0000-C914-BA3F-E14BF4BA3762}
[93] Ibid

ATTACHMENT 3

NEW YORK PUBLIC SERVICE LAW § 66-P (4) - THERE IS A SIGNIFICANT INCREASE IN CUSTOMERS IN ARREARS

Safety Valve

This attachment evaluates residential customer in arrears data to estimate whether there has been a significant increase in arrears consistent with New York Public Service Law § 66-p (4).

Residential Collection Data

Utilities file a monthly report in the PSC Case 91-M-0744 docket that details their arrears and service terminations. There is a data set in New York Open Data[94] that provides this information that can be used to determine the number of residential customer in arrears. The "Quarterly snapshot of residential collection dataset"[95] contains the following information:

> This dataset provides a quarterly snapshot of residential bill collection activity for New York State's ten largest electric and gas distribution utility companies regulated by the Public Service Commission. Included in this dataset are each

[94] https://data.ny.gov/
[95] https://data.ny.gov/Energy-Environment/Key-Credit-Collection-Beginning-2010/kdjh-dhwi/about_data

utility's total number of residential customers, residential customers with arrears (overdue bills) greater than 60 days, residential final service termination notices issued, residential accounts terminated (service shut off for nonpayment), active residential deferred payment agreements and the number of uncollectible residential accounts. Also included are the corresponding utility sales figures for each metric above, showing the dollar figure represented.

Company Residential Customer Summary

Table 1 lists the annual fourth quarter data for the sum of the Quarterly Snapshot NGrid-Upstate company category for the total number of residential customers, residential customers with arrears (overdue bills) greater than 60 days, and the percentage of residential customers with overdue bills relative to the total number of customers. Between 2019 the last year before the CLCPA was implemented and the most recent year there were 202,538 customers with arrears greater than 60 days, and at the end of 2024 there were 234.694 customers in arrears which is an increase of 32,156 or 16% increase. The final termination notices and number of service disconnections (not shown) are not good estimates of the effect of the CLCPA because other mandates have affected the data, e.g., service disconnections were suspended during COVID.

Table 1: Niagara Mohawk Power Corporation dba National Grid Summary Snapshot Fourth Quarter of Residential Collection Data

Fourth Quarter Year	Residential Customers	Customers with Arrears Greater than 60 Days	Final Termination Notices Issued	Accounts Terminated	Residential Sales
2010	1,445,863	243,753	99,835	90	$ 224,259,913
2011	1,451,929	230,115	101,177	551	$ 200,120,627
2012	1,442,251	226,902	87,898	365	$ 201,353,721
2013	1,470,136	229,976	102,031	135	$ 226,208,462
2014	1,491,265	231,349	84,087	506	$ 206,768,798
2015	1,457,649	215,895	84,470	1,555	$ 189,312,122
2016	1,482,686	214,840	78,561	340	$ 170,195,314
2017	1,477,163	207,978	72,279	251	$ 186,623,152
2018	1,473,253	209,665	59,690	4	$ 201,878,357
2019	1,473,892	202,538	60,977	21	$ 182,255,822
2020	1,491,549	265,502	0	0	$ 201,018,939
2021	1,492,188	230,784	54,503	0	$ 235,669,477
2022	1,489,812	245,260	54,967	30	$ 235,027,372
2023	1,494,335	243,408	58,334	14	$ 250,072,985
2024	1,492,482	234,694	40,639	209	$ 263,102,404

Standard Deviation 2010-2019

Customers with Arrears Greater than 60 Days
12,350

Difference 2019 and 2024

32,156

The Public Safety Law section 66-p (4) criteria for consideration of suspension or modification is a "significant increase in arrears or service disconnections that the commission determines is related to the program". The standard deviation of the number of customers in arrears from 2010 to 2019 is 12,350. Because the observed difference, 32,156 is greater than two times the standard deviations the increase is "significant".

CLCPA Costs

The number of people in arrears has been increasing since 2010 and the change since the start of the Climate Act is "significant". However, it is not clear

how much of the change in overdue bills can be ascribed to the CLCPA as opposed to other factors. On May 12, 2022, the Commission issued an "Order on Implementation of the Climate Leadership and Community Protection Act" for Case 22-M-0149 that directs[96] DPS Staff to present information on CLCPA costs annually. On July 20, 2023, DPS Staff published the first report[97] (Information Report) in compliance with the Commission's Order. The costs recovered in 2022 by the utilities associated with CLCPA costs were described in the following Information Report tables[98]:

[96] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={5F73F855-B506-41B3-AB05-3CF66F736497}
[97] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={20E17489-0000-C114-AD41-8089369DB6F3}
[98] Ibid

TABLE 3 2022 Gas CLCPA/ Gas Energy Efficiency Recoveries	
Utility	**Cost Recoveries**
Central Hudson	$1,182,000
Con Edison	$14,207,113
KEDLI	$29,200,026
KEDNY	$37,524,615
NFG	$9,518,260
NMPC	$17,412,995
NYSEG	$2,505,000
O&R	$703,000
RG&E	$705,333
Corning	$9,156
Total	$112,967,498

TABLE 4 2022 Electric CLCPA Recoveries in thousands of dollars								
Program	**Central Hudson**	**Con Edison**	**NYSEG**	**NMPC**	**O&R**	**RG&E**	**LIPA**	**Total**
CES[1]	$15,960	$117,560	$46,850	$85,945	$10,970	$20,053	$50,748	$348,087
CEF	$28,675	$211,431	$59,559	$146,730	$20,699	$33,199		$500,294
VDER[2]	$4,063	$8,254	$5,959	$13,827	$3,511	$1,330	$1,310	$38,254
EV Make Ready Program	$88	$737	$119	$225	$185	$61	$1,288	$2,703
Storage[3]								
IEDR	$263	$4,314	$731	$1,419	$410	$385		$7,524
Electric EE/BE (heat pumps)[4]	$12,768	83,279	10,850	85,679	$978	$4,472	$80,902	$278,928
Transmission Upgrades[5]								
Total	$61,817	$425,577	$124,068	$333,825	$36,754	$59,500	$134,248	$1,175,788

[1] – CES recoveries include: Tier 1 and 2 RECs, VDER Market Environmental Recoveries, and Tier 3 ZEC recoveries. LIPA CES excludes Tier 1 RECs which are not available. The environmental attributes included in bundled purchases associated with LIPA's feed-in tariffs cannot be disaggregated.

[2] – Includes recoveries of out of market capacity, out of market environmental, market transition credit, and community credit payments.

[3] – Storage related recoveries not included. The costs for the NYSERDA Energy Storage incentive program were funded from pre-2022 CEF collections. Electric utilities: (1) own and/or have procured customer sided storage projects for non-wires alternatives, (2) own storage pilot projects; and (3) own demonstration projects. Staff did not consider such storage assets as CLCPA related. Additionally, utilities have issued requests for proposals to acquire dispatch rights for large scale storage projects. Utilities recovered implementation costs and received revenues from participation fees associated with storage dispatch rights procurements in 2022. However, the net was de minimis. Staff plans to report on dispatchable storage costs/benefits in future reports.

[4] – Including clean heat (heat pump) program recoveries.

[5] – Transmission costs are not included in the above table as many of the programs for Phase 1, Phase 2 and other related transmission project efforts pursuant to the Accelerated Renewables Act were authorized in 2022. Expenditures related to transmission will be reported in subsequent annual reports as they are incurred.

2022 CLCPA Costs as a Function of Sales

There is insufficient information to ascribe the Company CLCPA costs associated with the significant increase in arrears observed. However, it is instructive to calculate the percentage of Information Report Company CLCPA costs relative to the annual Company residential customer sales.

Table 2 lists the sum of the annual "Quarterly snapshot of residential collection dataset" residential sales for the Company.

Table 2: Company Annual Utility Residential Customer Sales

Year	Residential Sales
2010	$ 792,654,639
2011	$ 776,628,028
2012	$ 701,888,288
2013	$ 736,476,636
2014	$ 825,764,830
2015	$ 733,517,461
2016	$ 569,600,184
2017	$ 664,136,737
2018	$ 703,774,289
2019	$ 641,586,881
2020	$ 696,537,676
2021	$ 840,991,765
2022	$ 916,540,809
2023	$ 893,811,209
2024	$ 907,497,727

The CLCPA cost recoveries for the Company are listed in Information Report Tables 3 and 4 included above. The sum of the 2022 CLCPA costs is $352,237,995. The CLCPA costs are 38% of the 2022 residential customer sales. The Commission and the Company should formally determine the amount of residential customer sales that are related to the CLCPA and affect the number of customers in arrears.

No Practical Effect of JP on Global Warming

Even if CLCPA was to fully achieve its sustainability objectives, the New York emissions reductions possible are negligible and the resulting global

temperature change is infinitesimally small. Funding the CLCPA goals included in the JP will have no impact on global warming.

If New York were able to eliminate all its GHG emissions, the effect of global emission increases elsewhere would supplant our efforts in one year. New York GHG emissions[99] are less than one half of one percent of global emissions and global emissions have been increasing on average by more than one half of one percent per year since 1990.

Furthermore, New York's impact on global warming is unmeasurable. A Perplexity AI query[100] "What is the expected change in global warming per ton of CO2 reduced" found that "Current estimates suggest that reducing 1 gigaton (1 billion tons) of CO_2 emissions prevents approximately 0.00045°C of warming". That conversion was applied to the expected Company GHG emission reductions expected in Exhibit CLCPA-2 included in the Company's CLCPA Panel testimony on May 8, 2024[101] as well as historical emissions (Table 3)[102]. Emissions attributable to the CLCPA and historical emissions predict no measurable changes in global warming.

[99] https://pragmaticenvironmentalistofnewyork.blog/2024/02/27/update-climate-act-emission-reductions-in-context/
[100] https://pragmaticenvironmentalistofnewyork.wordpress.com/wp-content/uploads/2025/04/what-is-the-expected-change-in-global-warming-per.pdf
[101] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={D01EC18F-0000-C342-87E6-80D5F22FB0A8}
[102] https://pragmaticenvironmentalistofnewyork.wordpress.com/wp-content/uploads/2025/05/nmpc-averted-warmiing.xlsx

Table 3: Potential Warming Savings for JP Emission Reductions and Historical Emissions

Joint Proposal CLCPA Panel Testimony - 5/8/2024	Emissions	Warming Potential deg C	
Exhibit__(CLCPA-2)	621,608	2.797E-07	0.00000028

Historical Emissions	Emissions	Warming Potential deg C	
2024 Electric Sector	31,201,251	1.404E-05	0.00001404
1990 Total NYS GHG Emissions GWP-20	409,302,295	1.842E-04	0.00018419
2022 Total NYS GHG Emissions GWP-20	371,381,377	1.671E-04	0.00016712