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Administrative Law Judge Daniel P. O'Connell
New York State Department of Environmental Conservation
Office of Hearings and Mediation Services, 1st Floor
625 Broadway
Albany, NY, 12233-1550

Submitted via email to: comment.nrgastoriagas@dec.ny.gov

Re: Astoria Gas Turbine Power Replacement Project Title V Permit Application

Dear ALJ O'Connell,

I am submitting comments on the Department of Environmental Conservation (DEC) Astoria Gas Turbine Power Replacement Project Title V Permit Application decision to deny the permit. These comments are submitted as a private, retired citizen. They do not reflect the position of any of my previous employers or any other organization I have been associated with, these comments are mine alone.

Background

I think my background is well suited to provide these comments. I am a retired air pollution meteorologist with over 40 years-experience analyzing the relationship between air quality and environmental standards. In addition, I am intimately familiar with the NRG Astoria Gas Turbine facility, the role of the facility as a provider of necessary peaking power, and the history of various attempts to re-power it since NRG Energy purchased the facility. Before I retired from NRG in 2010, I was responsible for compliance with the NOx RACT averaging plan and worked with a couple of re-powering applications. Although I had no involvement whatsoever in the latest re-powering plan, I think my perspective is useful.

Very soon after NRG purchased the Arthur Kill generating station and the Astoria Gas turbines, plans were set into motion to develop replacement power. During my tenure there were at least two different re-powering proposals and I believe permits for re-development were approved for one of the projects. In what I believe is a failure of the deregulated electricity market model, the re-powering project was never developed because the company decided the profit margin was too low. If the facility had been a component of a traditional utility system, then I have no doubt that when the DEC approached the owners and said they are old, dirty, and inefficient so they need to be replaced, that they would have been replaced in the first decade of this century. Because of this market failure, the antiquated facility has continued to run.

Fifteen years ago, there was general support for a re-powering plan that would have replaced the old turbines with a modern, efficient and less-polluting alternative. It was recognized that the facility plays a valuable role providing reliable electricity in the New York City load pocket. Although there would

have been reduced emissions and improved air quality the tradeoff was that while there was still an air quality impact, it was an improvement and less than the National Ambient Air Quality standards protective of health and welfare.

Today the concept of environmental tradeoffs is unacceptable to vocal and well-organized groups whose emotional perceptions of air quality justice out-weigh reality. The political landscape has also changed such that the DEC mindlessly caters to this demographic. These comments address these issues.

Air Quality Background

The [Clean Air Act](#), which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for six principal pollutants ("[criteria" air pollutants](#)) which can be harmful to public health and the environment. The [National Ambient Air Quality Standards](#) (NAAQS) "provide public health protection, including protecting the health of 'sensitive' populations such as asthmatics, children, and the elderly". My career is based on the presumption that air quality that meets those standards is acceptable.

In order to achieve and maintain air quality that meets the NAAQS the Environmental Protection Agency and state and local regulatory agencies have developed [extensive procedures](#). In this instance the important thing to know is that they have been monitoring air quality ever since the Clean Air Act was enacted and they have developed air quality models that can be used to predict ambient concentrations. Importantly, the numerical models are based on observations and have been verified as being accurate. Using those tools over the years regulatory agencies have a very good understanding of the status of air quality relative to the NAAQS. According to the [EPA nonattainment/maintenance status summary](#), there are multiple counties in New York that do not attain the NAAQS for ozone and New York County does not meet the coarse particulate matter standard. Note that all of New York State meets the inhalable particulate NAAQS. All the other pollutants are in attainment.

Despite the fact that New York City is in attainment for inhalable particulates, this pollutant is used as a rationale for shutting down peaking power plants because of claims that reducing inhalable air quality impacts is beneficial. For example, the New York City Department of Health and Mental Hygiene's (DOHMH) [Air Pollution and the Health of New Yorkers report](#) is often referenced in this regard. The DOHMH report concludes: "Each year, PM_{2.5} pollution in [New York City] causes more than 3,000 deaths, 2,000 hospital admissions for lung and heart conditions, and approximately 6,000 emergency department visits for asthma in children and adults." These conclusions are for average air pollution levels in New York City as a whole over the period 2005-2007.

The [NYS DEC air quality monitoring system](#) has operated a PM_{2.5} monitor at the Botanical Garden in New York City since 1999 which provides inhalable particulate trends for New York City. I compared the data from that site for the same period as the DOHMH analysis relative to the most recent data available (Table 1). The Botanical Garden site had an annual average PM_{2.5} level of 13 µg/m³ for the same period as the report's 13.9 µg/m³ "current conditions" city-wide average (my estimate based on their graph). The important thing to note is that the latest available average (2018-2020) for a comparable three-year average at the Botanical Garden is 7.4 µg/m³ which represents a 43% decrease.

Table 1: Data from Figure 4. Baseline Annual Average PM2.5 Levels in New York City (2005-2007) and DEC Measurement Levels in Comparison Scenarios

DOHMOH [Air Pollution and the Health of New Yorkers report](#)

Departments of Health and Mental Hygiene	Averaging Period	Annual Average PM2.5 (ug/m3)	
Current conditions	2005-2007	13.9	Source: United States Environmental Protection Agency Air Quality System (AQS)
10% less than current	2005-2007	12.5	Annual average concentrations reduced by 10%, calculated from USEPA AQS
Lowest US Cities	2005-2007	10.9	Lowest annual average concentrations among the 9 US cities with greater than 1,000,000 residents.
Background		1.0	Concentrations in U.S. Northeast assuming no anthropogenic emissions from sources within the U.S.
NYSDEC Monitoring			
Botanical Garden	2005-2007	13.0	Site ID: 36-005-0083/0133
Botanical Garden	2016-2018	8.1	Site ID: 36-005-0083/0133
Botanical Garden	2018-2020	7.4	Site ID: 36-005-0083/0133

[NYS DEC air quality monitoring system](#)
[NYS DEC air quality monitoring system](#)
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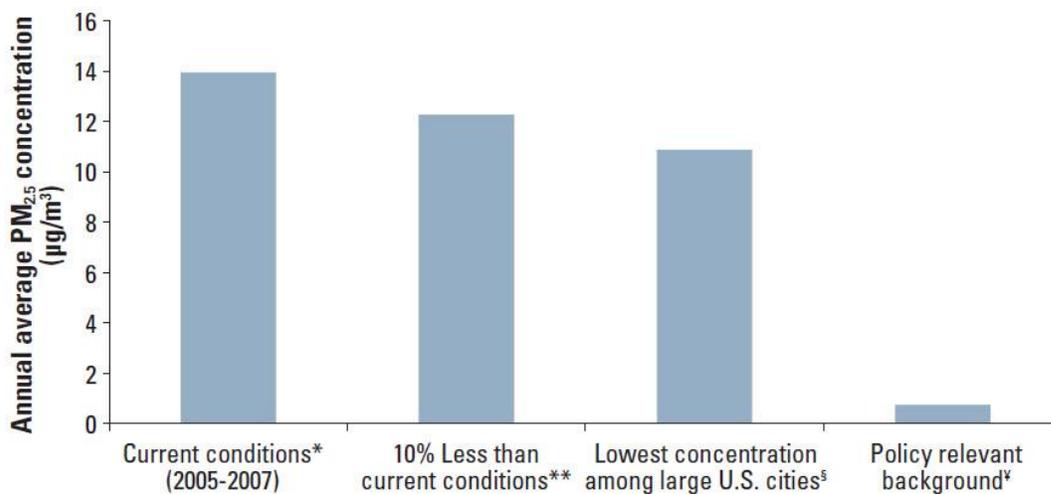
The DOHMOH air quality health assessment depends on a [linear no-threshold model](#). Originally used for radiation assessment, in that context it suggests that each time radiation is deposited in the susceptible target there is a probability of tumor initiation. Note, however, that its use in radiation assessment is [controversial](#). In my opinion, I don't think it has been verified well enough to justify its use for air quality impacts thus calling into question the DOHMOH allegations of health benefits.

The DOHMOH report specified four scenarios for comparisons ([DOHMOH Figure 4](#)) and calculated health events that it attributed to citywide PM_{2.5} ([DOHMOH Table 5](#)). Based on their results the report notes that:

Even a feasible, modest reduction (10%) in PM_{2.5} concentrations could prevent more than 300 premature deaths, 200 hospital admissions and 600 emergency department visits. Achieving the PlaNYC goal of “cleanest air of any big city” would result in even more substantial public health benefits.

The 2018-2020 average PM_{2.5} concentration was 7.4 µg/m³ which is substantially lower than the PlaNYC goal of “cleanest air of any big city” scenario at an estimated city-wide average of 10.9 µg/m³. Until such time that the projected health impacts are validated with observed data, I remain skeptical.

Figure 4. Baseline annual average PM_{2.5} levels in New York City (2005-2007) and levels in comparison scenarios.



PM_{2.5}=particulate matter

* Current conditions=annual average PM_{2.5} concentrations, 2005-2007 Source: United States Environmental Protection Agency Air Quality System (AQS)

** 10% Less than Current Conditions=2005-2007 Annual average concentrations reduced by 10%, calculated from USEPA AQS

§ Lowest concentration among large US Cities: Lowest 2005-2007 annual average concentrations among the 9 US cities with greter than 1.000.000 residents.

¶ Policy relevant background – Annual average PM_{2.5} concentrations in U.S. Northeast assuming no anthropogenic emissions from sources within the U.S., as predicted by the Community Multiscale Air Quality Modeling System (CMAQ) and the Goddard Earth Observing System (GEOS)-Chem model Source: EPA 2009

Table 5. Annual health events attributable to citywide PM_{2.5} levels and the health benefits of reduced PM_{2.5} levels.

Health Effect	Age Group	Annual Health Events Attributable to Current PM _{2.5} Compared to Background Levels			Annual Health Events Prevented: PM _{2.5} Levels Reduced 10%			Annual Health Events Prevented: PM _{2.5} Levels Reduced to Cleanest Air of Any Large City		
		Number of Events (95% CI)*	Rate per 100,000 people	Percent (%) of Events**	Number of Events (95% CI)	Annual Rate per 100,000 people	Percent (%) of Events**	Number of Events (95% CI)*	Annual Rate per 100,000 people	Percent (%) of Events**
PM _{2.5}	Premature mortality	3,200 (2200,4100)	65	6.4	380 (240,460)	7.1	0.7	760 (520,1000)	16	1.5
	Hospital admissions for respiratory conditions	1,200 (460,1900)	20	2.6	130 (50,210)	2.1	0.3	280 (109,460)	4.7	0.6
	Hospital admissions for cardiovascular conditions	920 (210,1630)	26	1.1	100 (20,170)	2.8	0.1	220 (50,380)	6.0	0.3
	Emergency department visits for asthma	2,400 (1400,3400)	130	5.6	270 (160,370)	14	0.6	580 (340,810)	30	1.3
	Emergency department visits for asthma	3,600 (2200,4900)	57	6.1	390 (240,550)	6.3	0.7	850 (520,1200)	14	1.5

PM_{2.5}=particulate matter
 * CI=Confidence Interval
 ** Percent of certain citywide health events attributable to PM_{2.5} in the specified age range.

Peaking Power Plant Impacts

At this time, New York State energy and environmental policy is more about optics than facts. Nowhere is this more apparent than the recent spate of [opinion pieces](#), [reports](#), and [policy proposals](#) related to peaking power plants. In 2020 the [PEAK Coalition](#) released a report entitled: “[Dirty Energy, Big Money](#)” that has been used by environmental justice organizations to vilify all New York City’s peaking power plants, including the Astoria Gas Turbines. I have described this work in three posts on my blog [Pragmatic Environmentalist of New York](#). I published a [post](#) that provided information on the primary air quality problem associated with these facilities, the organizations behind the report, the State’s response to date, the underlying issue of environmental justice and addressed the motivation for the analysis. The [second post](#) addressed the rationale and feasibility of the proposed plan to replace these peaking facilities with “renewable and clean energy alternatives” relative to environmental effects, affordability, and reliability. Finally, I [discussed](#) the [Physicians, Scientists, and Engineers \(PSE\) for Healthy Energy](#) report [Opportunities for Replacing Peaker Plants with Energy Storage in New York State](#) that provided technical information used by the PEAK Coalition.

The PEAK Coalition report is based on [work](#) by [Physicians, Scientists, and Engineers \(PSE\) for Healthy Energy](#). PSE evaluated Federal data peaking power plants across the country based on fuel type, capacity, technology and how much they ran. This is a blunt approach that cannot address any of the nuances that have resulted in some units running for short times. This is a simplistic rationale for suggesting that all such facilities can be replaced. Site specific considerations such as the fact that New York City is essentially a load pocket with specific reliability constraints, are ignored in the report.

In order to prove the need for a clean energy alternative, PSE combined the peaking power plant data with ambient air quality data to show that the peaking plants often run at the same time that there are National Ambient Air Quality Standard exceedances. That is a well-known fact that has been the basis of

DEC policies for these facilities for decades. PSE also developed a “cumulative vulnerability index that integrates data on health burdens (asthma, heart attacks, premature birth rates); environmental burdens (ozone, particulate matter, toxics, traffic proximity, lead paint, and hazardous facilities); and demographic indicators (low-income, minority, linguistically isolated, and non-high school-educated populations)”. All of these data were combined to make the claim that these plants need to be replaced.

However, I don’t think that the PSE approach made a convincing case that the peaking power plants are the primary driver of environmental burdens on neighboring communities. Their vulnerability index lists other factors but makes no attempt to attribute impacts to each factor. The ultimate problem with this approach is that the peak unit justification relies on environmental burdens from ozone and particulate matter air quality impacts. However, ozone is a secondary air pollutant and the vast majority of ambient PM2.5 from power plants is also a secondary pollutant. As a result, there is enough of a lag between the time emissions are released and creation of either ozone or PM2.5 that the impact is felt far away. That means that the accused peaking power plants do not create the air quality impact problems alleged to occur to the environmental justice communities located near the plants. In fact, because [NOx scavenges ozone](#) the peaker plants reduce local ozone if they have any effect at all.

Climate Act Impacts

Compounding the pressure on these facilities is New York’s Climate Leadership and Community Leadership Act (Climate Act) which includes a mandate for a “zero-emissions” electric generating system by 2040. Proponents often point out that this is the law and compliance is required. However, there is an overriding Public Service Commission mandate. [Public Service \(PBS\) CHAPTER 48, ARTICLE 4, § 66-p. Establishment of a renewable energy program](#) (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.

I interpret that to mean that the Climate Act has to meet the obligation to not impede the provision of safe and adequate electric service (i.e., reliability). DEC’s focus on meeting the Climate Act targets ignores this obligation.

This proceeding is necessary because NRG is appealing the DEC decision to deny the Title V application that included a proposal to construct the Astoria Replacement Project, which would consist of a new simple cycle dual fuel fossil fuel-fired peaking combustion turbine generator. According to [Commissioner Seggos](#): “Our review determined the proposed project does not demonstrate compliance with the requirements of the Climate Leadership and Community Protection Act. The proposed project would be inconsistent with or would interfere with the statewide greenhouse gas emissions limits established in the Climate Act. Astoria NRG failed to demonstrate the need or justification for the proposed project notwithstanding this inconsistency.”

The [DEC decision letter](#) noted that DEC reviewed information submitted by Astoria, including in the initial Title V air permit application as well as supplemental materials provided in response to requests for additional information, the Supplemental Draft Environmental Impact Statement prepared for the Project, and over 6,600 public comments received from individuals or organizations during the public comment period. The letter went on to claim that “the Project would be inconsistent with or would interfere with the attainment of the Statewide greenhouse gas (GHG) emission limits established in Article 75 of the Environmental Conservation Law (ECL)”. Because DEC was unable to satisfy elements required by Section 7(2) of the Climate Leadership and Community Protection Act” the application was denied.

I am not going to comment extensively on this rationale. It does seem to me to be a stretch to claim that the permit has to be denied when the only regulations associated with the Climate Act specify the GHG emissions targets. At the time of the denial there was no guidance available and the comment period on the draft guidance ended last month. Furthermore, nothing has been promulgated to specify how the State will meet those limits so I believe it is premature to speculate how future regulations could impact the application.

The rejection of the permit application is especially troubling because in the DEC’s “Notice of Denial of Title V Air Permit” for the Astoria Gas Turbine Power Project (DEC ID: 2-6301-00191/00014), DEC rejected the use of both hydrogen and renewable natural gas (RNG) as a 2040 compliance mechanism. The rationale was because the DEC labeled them “speculative” and “aspirational”. However, the Draft Scoping Plan’s placeholder for a dispatchable, emission-free resource is hydrogen. Governor Hochul’s recent State of the State address proposes that New York position itself to compete for nearly \$10 billion in federal funding for green hydrogen R&D under the federal infrastructure bill. Obviously, it is in the state’s best interest to preserve the option to use hydrogen in the future. In the meantime, the options to supplant the dispatchable energy from those facilities with energy storage and renewable energy alternatives are no less “speculative” and “aspirational”. DEC’s decision to reject the permit on this basis is a serious threat to reliability.

Reliability Impacts

As noted previously, I believe the Climate Act has to meet the obligation to not impede the provision of safe and adequate electric service. It is obvious that there are serious limitations with existing technology and the aggressive schedule that DEC presumes eliminates the need for the Astoria Replacement Project. For example, consider the New York Independent System Operator (NYISO) 2021-2030 Comprehensive Reliability Plan that is the most recent reliability study in New York. It states:

Moving to 2040, the CLCPA requires generation to be emission-free. The [Climate Change Study](#) looked at 100 x 40 (emission-free electric grid by 2040). It noted the significant amount of dispatchable resources that would be needed to meet that goal but did not describe the technology that would be able to provide a dispatchable resource, instead choosing to refer to generic dispatchable, emission-free resources. Not surprisingly, the Climate Change report found that a similar amount of dispatchable resources as the RNA case would be needed to maintain reliability under baseline assumptions. However, under CLCPA assumptions, the

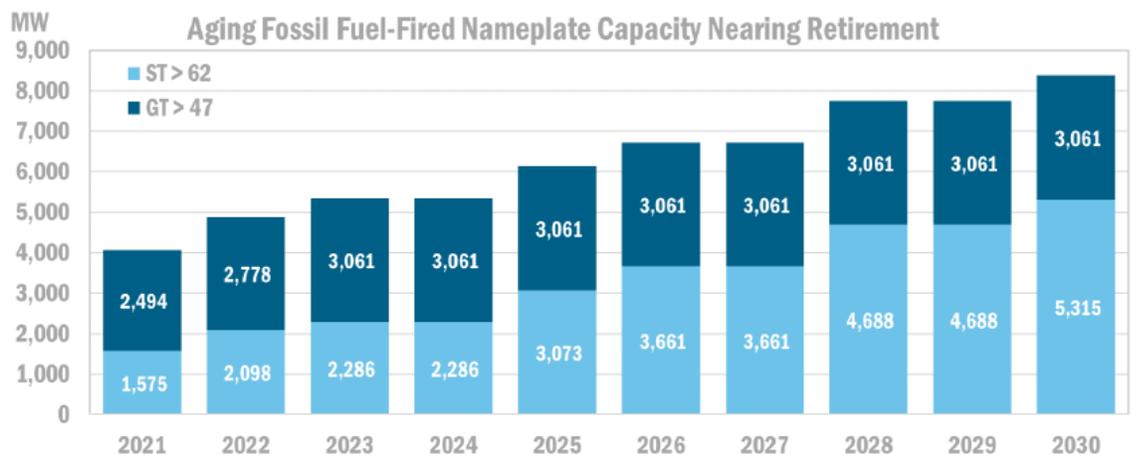
amount of dispatchable emission-free resources needed increases to over 32,000 MW in 2040, approximately 6,000 MW more than the total fossil-fueled generation fleet on the grid in 2021. The Climate Change Study noted that the current system is heavily dependent on existing fossil-fueled resources to maintain reliability and eliminating these resources from the mix “will require an *unprecedented level of investment in new and replacement infrastructure, and/or the emergence of a zero-carbon fuel source for thermal generating resources*” (emphasis added)¹. The Climate Change Study did note that while the amount of installed capacity (MW) of dispatchable resources is significant, the amount of energy generated (MWh) required from such resources would likely not be significant, with the percent of total energy being in the range of 10% — 20% range depending on the penetration level of intermittent resources.

At this time, we don't know what the new sources of dispatchable emission-free resources will be. Given that the Draft Scoping Plan uses hydrogen as a placeholder it is inappropriate for the DEC to presume that it will not be hydrogen used in the future. Therefore, the rationale that the Astoria Replacement Project is incompatible with the Climate Act is inappropriate.

Furthermore, there is another reliability concern. The NYISO CRP report also highlights some other risk factors that threaten electric system reliability. The CRP states:

As generators age and experience more frequent and longer duration outages, the costs to maintain the assets increase. These costs may drive aging generation into retirement. A growing amount of New York’s gas-turbine and fossil fuel-fired steam-turbine capacity is reaching an age at which, nationally, a vast majority of similar capacity has been deactivated. As shown in Figure 11, by 2028 more than 8,300 MW of gas-turbine and steam-turbine based capacity in New York will reach an age beyond which 95% of these types of generators have deactivated.

Figure 11: Cumulative NYCA Nameplate Capacity MW Past the Age When 95% of Similar Units Have Retired



¹ Page 13 of the *Climate Change Impact and Resilience Study – Phase II*
<https://www.nyiso.com/documents/20142/10773574/NYISO-Climate-Impact-Study-Phase-2-Report.pdf>

The impact of the unavailability of system resources can readily be seen through tipping point evaluations. While transmission security within New York City (Zone J) is maintained through the ten-year period in accordance with design criteria, the margin would be very tight starting in 2025 and would be deficient beginning in 2028 if forced outages are experienced at the historical rate, as shown in Figure 12². Transmission security within Long Island (Zone K) is also maintained through the ten-year period, with the slimmest margin in the first few years as shown in Figure 13. If forced outages are experienced at the historical rate the Long Island margin would be sufficient through the study period.

Figure 12: New York City Transmission Security Margin (Summer Baseline Peak Forecast – Normal Operations)

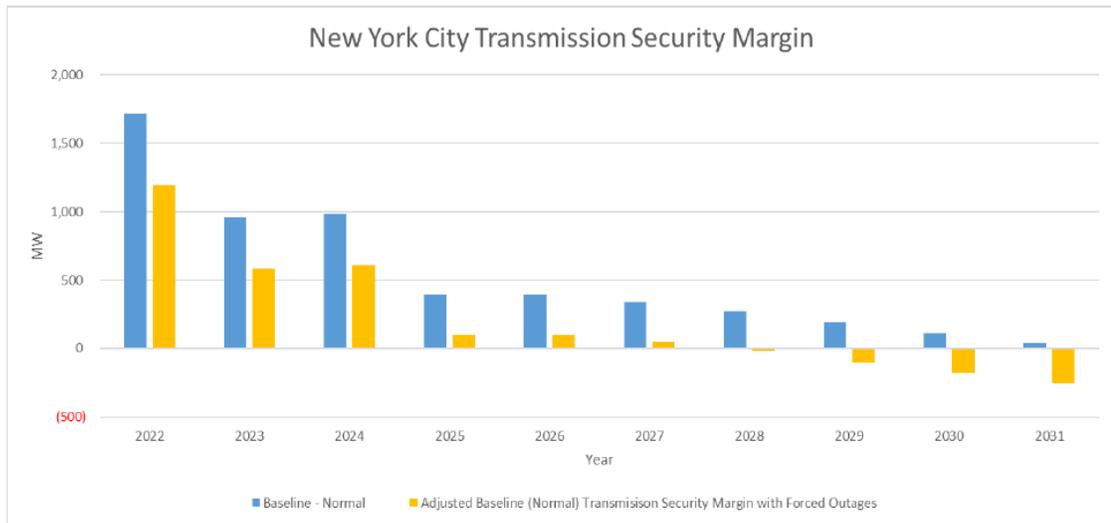
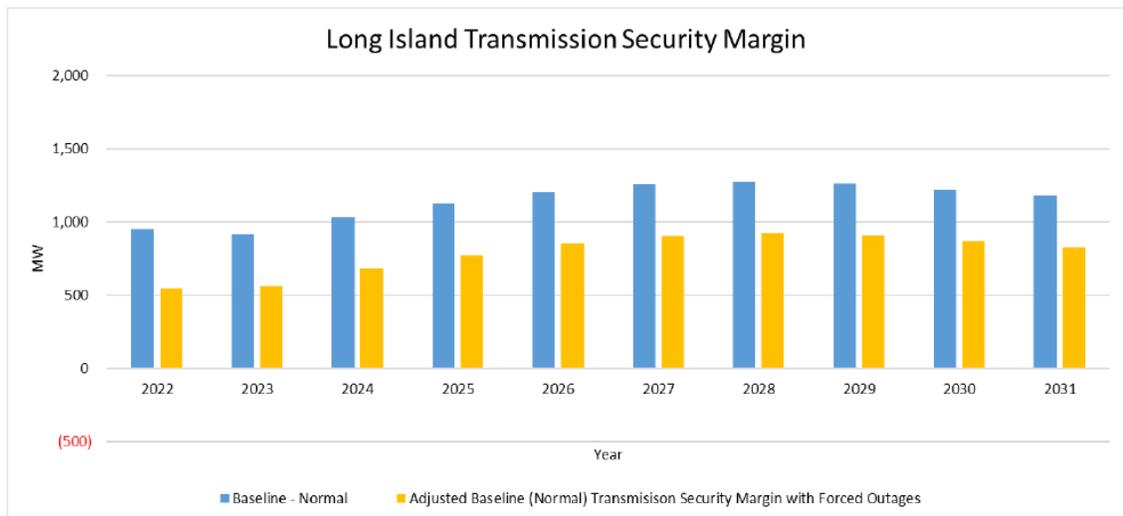


Figure 13: Long Island Transmission Security Margin (Summer Baseline Peak Forecast – Normal Operations)



² Additional transmission, resources, or demand reduction within New York City may increase the margin and reduce the likelihood of future reliability needs.

Obviously, the Astoria Replacement Project would directly address this problem.

Conclusion

The Climate Act has the obligation to not impede the provision of safe and adequate electric service. DEC's denial of the Astoria Gas Turbine Title V application because it: "Does not demonstrate compliance with the requirements of the Climate Leadership and Community Protection Act" is at odds with that mandate.

DEC's transparent appeasement of the many commenters who submitted comments based on misleading air quality impacts from the grey literature [PEAK Coalition "Dirty Energy, Big Money"](#) report is ill conceived. The alleged health impacts are all due to secondary ozone and inhalable particulates. Because they are secondary pollutants they are not formed until they have been transported away from the immediate neighborhoods that Peak Coalition claims are affected. Unfortunately, there is no currently available technology that has been proven at the scale necessary that can replace fossil-fired generation in New York City reliably and affordably. With all due respect to the environmental justice organizations like the Peak Coalition, they have no reliability or affordability responsibilities so their priorities differ. If reliability and affordability are not prioritized it could easily result in an electric system that does not maintain current standards. More importantly, those issues impact disadvantaged communities more than other communities so they should be the over-arching priority.

The bottom line is that New York State should be grateful that someone is willing to come in and provide an interim solution that will guarantee New York City electric system reliability standards are maintained. All that DEC needs to do is to add a permit condition that makes it clear that the operating certificate will be pulled if certain conditions are met. If technology is proven available to replace the proposed Astoria Replacement Project on the Climate Act schedule, then the facility gets shut down at that time. If it turns out that the "zero-emissions" technology solution is hydrogen combustion in a turbine designed to burn that fuel as well as natural gas as proposed by the applicant, then the facility can continue to operate with that fuel. It is not clear how DEC can reconcile throwing away these reliability options when there is no other option available.

Thank you for the opportunity to comment.

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