Caiazza Draft New York State Energy Plan Comments
On the Future of Natural Gas

Introduction

The natural gas policies incorporated into the Climate Leadership & Community Protection Act that drive the Draft Energy Plan are not based on facts or research but ideology. These comments address the irrational vilification of natural gas and the benefits of continued use of natural gas towards a reliable and affordable energy system in the Draft Energy Plan.

Irrational Methane Basis

New York's obsession with eliminating natural gas is irrational. New York's war on natural gas or methane is not based on pragmatic balancing of issues of cost, efficiency, and benefits, but only on an ideology built on the hatred of the natural gas industry. The underlying basis for not using natural gas is because of impacts on global warming, namely the higher observed global warming potential of methane molecules compared to carbon dioxide in the lab. However, that argument ignores the fact that changes in methane atmospheric concentrations have negligible climate impacts compared to CO2.

The relative impact of methane and carbon dioxide emissions on longwave radiation that causes the greenhouse gas effect is described in the following references:

- Steve Gorham explains that "Because of greenhouse gas saturation in the atmosphere, methane regulations across the world will have no measurable effect on global temperatures." This is a good overview of the irrelevance of methane.
- Wijngaarden and Happer also did a paper on methane itself. They argued that the effect of the observed rate of CO2 molecules is so much bigger than the increase in methane atmospheric concentrations so the methane forcing is one tenth that of CO2. The paper attempts to explain complex relationships for the general public but is still dense. Fortunately Vijay Jararaj summarized their work and conclusions.
- Andy May's also summarized Wijngaarden and Happer's important paper "Dependence of Earth's Thermal Radiation on Five Most Abundant Greenhouse Gases" explains that the greenhouse effect of methane is not only related to the effect on longwave radiation itself but also the concentration in the atmosphere. Because the atmospheric concentration of methane is so small doubling concentrations change the "outgoing forcing by less than one percent". In other words, doubling emissions or cutting emissions in half of methane will have no measurable effect on global warming itself.

- Clyde Spencer explained that changes to radiation effects occur on a molecule-by-molecule basis in the atmosphere in an article titled The Misguided Crusade to Reduce Anthropogenic Methane Emissions. The Climate Act tracks emissions by weight. In the atmosphere CO2 is more than two orders of magnitude more abundant than CH4 on a molecular basis. The Climate Act uses the global warming potential that estimates the mid-range, long-term warming potential of CH4 is 32 times that of CO2. However, that equivalence is for equal weights of the two gases. Using a molecular basis (parts per million-volume mole-fraction) to account for the lighter CH4 molecule reveals that the annual contribution to warming is a fraction of that claimed for CO2. Methane emissions on a molecular basis are increasing at a rate of 0.58% of CO2 increases. Therefore, changes in methane emissions have insignificant effects.
- Methane molecules affect the outgoing radiation in the same spectral band as water vapor. The lab measurements are based on a standard dry atmosphere. In the atmosphere, methane's two main infrared absorption bands) are completely overlapped by two of the several broader and much stronger water vapor absorption bands. In a world averaging about 2% specific humidity, any methane effect is literally swamped by water vapor effect. In particular, water vapor reduces the potency of methane by about 82 percent at 80% relative humidity and at 46% relative humidity (from the US Standard Atmosphere) the reduction is 75%.
- Ralph B. Alexander describes another molecular consideration ignored in the Climate Act. Each greenhouse gas affects outgoing radiation differently across the bell-shaped radiation spectrum One of the reasons that CO2 is considered the most important greenhouse gas is that its effect coincides with the peak of the bell shape. On the other hand, the effect of CH4 is down in the tail of the bell shape. As a result, the potential effect of CH4 is on the order of only 20% of the effect of CO2.
- The residence time of the CO_2 and methane is different. Methane only has a lifetime of about 10-12 years in the atmosphere. The "consensus" science claim is that 80% of the anthropogenic CO_2 emissions are removed within 300 years. (Note however that there are other estimates of much shorter residence times.) This means that CO2 is accumulating in the atmosphere. CH_4 is converted to CO_2 and is then counted in the monthly CO_2 measurements as part of the CO_2 flux. Because methane does not accumulate the same way as CO2 it should be handled differently. However, the Climate Act doubles down on using the same approach. Climate Act authors claimed it was necessary to use 20-year global warming potential (GWP) values because methane is estimated to be 28 to 36 greater than carbon dioxide for a 100-year time horizon but 84-87 greater GWP over a 20-year period.
- Dr. Mathew Wielicki gives a good, illustrated description that puts methane in perspective.

Critical Reliability Need for Natural Gas

One of the themes in the Draft Energy Plan is that the Climate Act law mandates compliance deadlines. However, it does not adequately acknowledge that Public Service Law (PSL) Section 66-P, Establishment of a renewable energy program, is also a law. PSL 66-P requires the Public Service Commission (PSC) to establish a program to ensure the State meets the 2030 and 2040 Climate Act obligations. It includes provisions stating that the PSC is empowered to temporarily suspend or modify these obligations if, after conducting an appropriate hearing, it finds that PSL 66-P impedes the provision of safe and adequate electric service.

With Richard Ellenbogen, Constatine Kontogiannis, and Francis Menton I submitted a filing in a PSC generic proceeding recommending that this provision be addressed. As described here, our submittal includes the primary filing, two exhibits documenting the customers in arrears safety valve trigger, and five supporting exhibits. Responsible New York agencies all agree that new Dispatchable Emissions-Free Resource (DEFR) technologies are needed to make a solar and wind-reliant electric energy system viable during extended periods of low wind and solar resource availability. Two of the supporting exhibits document the implications of this necessity. Exhibit 4 - Resource Gap Characterization analyzes gaps between Climate Act mandates and available resources, and Exhibit 5 – Dispatchable Emissions-Free Resources explains that the need for a resource that is not currently commercially available risks investments in false solutions. I maintain that safe and adequate electric service can only be guaranteed if the necessary DEFR technology has been proven feasible.

New York State has not developed a plan to ensure DEFR will be available as needed and that means that a natural gas generation must be available. NYSERDA's coordinated study to assess future grid reliability and stability under high-renewable scenarios in the GE Grid Performance Gaps Study states that New York needs approximately 25 gigawatts (GW) of capacity contribution by 2040 to replace the retiring fossil fuel fleet. The Draft Energy Plan must acknowledge that zero-emission resources that provide all the grid reliability services provided by natural gas generation simply will not be available by 2040. We must use natural gas as a bridge fuel until proven DEFR technologies are available.

Personal Reliability Need for Natural Gas

I do not think that the Energy Plan has adequately recognized the resiliency of natural gas and its benefits during electric outages. I have lived in my home for over 40 years. I have never had an outage of natural gas service. There have been many minor electric outages and two multi-

day blackouts: the September 1998 windstorm and the April 2003 ice storm. We survived because we had natural gas for heating and cooking. The Draft Energy Plan must acknowledge that recovery of an all-electric energy system will be extraordinarily challenging and that natural gas provides fuel diversity is necessary for a resilient energy system.

Transportation

Many argue that air pollution from diesel trucks is an environmental issue. To address this, the Transportation chapter of the Draft Energy Plan states:

> Medium and Heavy Duty Vehicles (MHDVs) and non-road vehicles are major energy users within the transportation sector and substantial contributors to the sector's GHG and local criteria pollutant emissions. Both industry segments have opportunities to electrify and move to ZEVs but are still in the early stages. MHDVs are a priority for New York State to electrify, with particular attention on electrifying school buses.

The chapter goes on to optimistically claim that markets for zero emissions options are "nearing maturity" but the reality is that there are significant issues. I acknowledge the use of Perplexity AI to generate a summary of substantial barriers to the success of electrification efforts for school buses and MHDVs That summary listed the following issues: financial and economic barriers, technical reliability and performance issues, cold weather performance limitations, infrastructure and grid capacity challenges, manufacturing and industry instability, and workforce issues. I would add that New York is a single jurisdiction and mandates for long-haul heavy-duty vehicles would require buy-in from many other jurisdictions.

I believe that natural gas use for transportation, particularly heavy-duty trucks and buses, would improve inhalable particulate impacts decades before zero-emission alternatives could be deployed because the technologies involved mature proven technologies. Another Perplexity AI query described the benefits of adopting CNG trucks. CNG trucks have up to 90% lower nitrogen oxide emissions and similar reductions of inhalable particulate matter mass emissions. There are fuel cost savings, a strong return on investment, and reduced maintenance costs while at the same time providing comparable power and performance and enhanced vehicle longevity. Also note that diesel trucks can be converted to run on CNG which is a claim that electric trucks will never make.

Natural Gas Electric System Advantages

The Draft Energy Plan does not acknowledge benefits of natural gas generation for New York's electric system.

To address intermittency of wind and solar resources it is cost-effective to over-build capacity. For example, if we were to rely entirely on solar, then we would have to build enough solar generation to provide the necessary power for the winter's shorter days. In the summer the days are longer, and less capacity would be needed. It is simply not possible to build a system with sufficient energy storage capacity to avoid over-building. This results in curtailment which "involves deliberately reducing renewable energy output below maximum potential, resulting in significant economic losses and underutilization of clean energy resources". Because natural gas units can be dispatched as needed curtailment is not an issue.

As noted previously a DEFR is needed for an electric generating system that relies on wind and solar. I believe that the most likely DEFR 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. If the only viable DEFR solution is nuclear, then renewables cannot be implemented without it. But nuclear works best as a base load resource so it can replace renewables, eliminating the need for a massive DEFR backup resource. Using nuclear as a baseload resource and natural gas generators for load-following and peaking services means there will be a use in the future if New York builds modern new natural gas turbines today. Replacing older, inefficient gas turbines with combined cycle turbines would also reduce emissions. It is common sense to replace aging natural gas-fired generating units that are nearing the end of their expected lifetime now rather than investing enormous money in renewables hoping a DEFR technology solution is found. If the only viable DEFR technology is nuclear then renewable energy is a false solution.

Arbitrary Permitting Decisions

I believe that environmental policy decisions should balance risks and benefits and that the rationale for permitting decisions should not be based on politics. The Draft Energy Plan should recognize that historical New York permitting decisions for natural gas pipelines are inconsistent with the on-going plans for renewable energy inspired transmission lines.

In one instance permits for the Constitution pipeline were rejected because of an inadequate water resource analysis for stream crossings. The Department of Environmental Conservation (DEC) was particularly worried about stream crossings. Rather than including permit conditions that require directional drilling to minimize impacts, DEC rejected the permit application outright. The permit denial came on Earth Day April 22, 2016, removing any thought that this wasn't a political decision rather than a technical decision

The Northeast Supply Enhancement (NESE) Gas Pipeline was also rejected by DEC because of water quality concerns. The project would have caused 17.4 miles of underwater sediment

disturbance in New York waters as part of a 23.5-mile total route from New Jersey coast to Rockaway, Queens. The 26-inch diameter natural gas pipeline required 4-6 feet burial depth. DEC's denial of the Water Quality Certification in May 2020 was based on the project's inability to demonstrate compliance with applicable water quality standards, particularly for mercury and copper contamination.

On the other hand, transmission line projects for renewable energy have managed to get permits. The Champlain Hudson Power Express (CHPE) successfully obtained permits because they "incorporated comprehensive monitoring and mitigation measures". Testing demonstrated that sediment disturbance was brief and temporary, with values remaining below established threshold levels. However, NESE pipeline installation would also have had brief and temporary impact.

A portion of the CHPE transmission line and lines for two offshore wind facilities will be routed through New York Harbor and presumably would also have mercury and copper contamination issues. On one hand the burial process for the transmission lines is less intrusive but on the other hand the disturbance lengths are longer. CHPE travels approximately 27.8 miles in New York Harbor. The Queensboro Renewable Express (Rise Light & Power) transmission line will have 18.5 miles of underwater sediment disturbance in New York waters with two HVDC cables within a 200-300 foot wide corridor. Equinor's Beacon Wind project had planned a much longer 115+ nautical mile transmission system from the offshore lease area OCS-A 0520 to the Astoria power complex. However, the company withdrew its transmission application in February 2025, citing project economics and regulatory challenges.

These permitting decisions were clearly decided based on politics. Denying them did not replace the need for the natural gas. Instead of secure and safe underground deliver natural gas is delivered used trucks. This absurd "solution" would be laughable were it not so dangerous. New York's Energy Plan should demand fuel-neutral permitting decisions.

Natural Gas for Peaking Power Plants

The Draft Energy Plan must acknowledge that natural gas peaking power plants provide necessary reliability support. Environmental justice advocates like the Peak Coalition, have convinced state politicians that New York City peaking power plants are "perhaps the most egregious energy-related example of what environmental injustice means today." The enacting law for the New York Power Authority (NYPA) Draft Renewables Strategic Plan specifically directed NYPA to publish a plan by May 3, 2025, to end generating electricity with fossil fuel at its 11 small natural gas power plant (SNGPP) units located at 7 sites in New York City and on Long Island by the end of 2030 if reliability and environmental requirements are met. I have

documented that the presumption of egregious harm is based on selective choice of metrics, poor understanding of air quality health impacts, and ignorance of air quality trends. In brief, the continued operation of these facilities will have no discernable impact on local neighborhood air quality and shutting them down is solely political virtue-signaling. On the other hand, these facilities serve specific reliability needs that are not easily replaced. At this time, any solutions offered will substantially increase reliability risks.

Conclusion

The Draft Energy Plan must recognize that the issues associated with renewable energy deployment cannot be ignored because the Climate Leadership & Community Protection Act has scheduled mandates. The Draft Energy Plan cannot ignore the necessity to establish PSL 66-P safety valve conditions for affordability and reliability that trigger feasibility analysis if the limits are exceeded.

If there were common sense PSL 66-P boundary conditions protecting New York affordability and reliability, then natural gas would be a key component of the Draft Energy Plan until such time that alternatives have been shown to be feasible. The natural gas policies incorporated into the Climate Act that drive the Draft Energy Plan are not based on facts or research but ideology. They are, in a word, irrational. Not so long ago the idea that natural gas could be used a bridge fuel until the aspirational "clean" generating resources and energy storage technologies could be tested at the scale needed, perform like a natural gas fired generating unit, and provide power at a similar cost, was generally accepted as a rational approach. The only rational approach to maintain reliability and lower costs is to go back to that concept.

I submitted this and other comments on the Draft Energy Plan because I am convinced that implementation of the New York Climate Act net-zero mandates will do more harm than good if the future electric system relies only on wind, solar, and energy storage because of reliability and affordability risks. I have been a practicing meteorologist for nearly 50 years, was a Certified Consulting Meteorologist, and have B.S. and M.S. degrees in meteorology. I have extensive experience with air pollution control theory, implementation, and evaluation, having worked on New York energy policy regulatory initiatives since 1981. I have followed the Climate Act since it was first proposed, submitted comments on the Climate Act implementation plan, and have written nearly 600 articles about New York's net-zero transition at my Pragmatic Environmentalist of New York blog. The opinions expressed in this document do not reflect the position of any of my previous employers or any other company I have been associated with, these comments are mine alone.

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