To: NJ BPU
From: Kirk Frost
Date: 7/5/2019
Subject: 2019 Draft Energy Master Plan - Clean Energy Comment – Natural Gas is not Clean Energy

Dear NJBPU,

There have been quite a few comment submissions to the 2019 Draft EMP indicating that Natural gas is either a clean energy or a part of the clean energy solution. Neither true.

Natural gas is a fossil fuel, currently being retrieved in the United States via injecting millions of tons of water, sand and proprietary (highly toxic) chemicals into the ground for each well shaft. The natural gas product has been significantly increasing in the past 10 years, especially in the Pennsylvania Marcellus Shale (see EIA Natural Gas production in Appendix). In fact, the proposed pipeline expansion projects and natural gas powerplant in **New Jersey** that are currently seeking approval or under construction will continue to drive up the Pennsylvania natural gas rush.

Natural gas, when burned, produces many toxic chemical emissions including greenhouse gases of Nitrous Oxide, Methane and Carbon Dioxide. The unique aspect of natural gas compared with other fossil fuels is that it emits methane and nitrous oxide. This is because the technology used by pipelines and powerplants are inferior outdated technology that actually doesn't burn all of natural gas fuel during combustion. It is very similar to have a stovetop burner on, but with several eyelets not lit with a flame. The methane escapes in the exhaust and in large quantities.

Note: This is not fugitive emissions, which the natural gas industry likes to focus on because there are no real measurements except what they claim. Ironically, a joint venture between Google and EDF demonstrates how fugitive emissions are much more than the reported estimates (found at: https://www.edf.org/climate/methanemaps). Below in the Appendix includes CS206 turbine methane emissions resulting from the 2 natural gas fired turbine combustion.

What does this all mean?

1. Natural gas is a fossil fuel that emits significant toxic chemicals and emits high amounts of greenhouse gases every year ***(ex: NESE CS206 and Meadowland power plant will emit 33.41 and 73 tons of Methane respectively every year from turbine combustion for the lifetime of that project – this doesn't include fugitive emissions).***
2. The rapid expansion in the Pennsylvania Marcellus Shale has caused many projects from various pipelines to pump more natural gas through pipelines that traverse through New Jersey, riddled with pipe segments that were installed back in 1950 and 1969 (for Transco mainlines A and C traversing across central New Jersey).
3. New Jersey Agencies and Federal agencies do not measure or monitor greenhouse emissions from natural gas pipelines and powerplants. All data is aggregated using estimates provided by the industry being measured.
4. Currently, New Jersey has no active monthly metrics of greenhouse gases from natural gas fired compressor stations and power plants, yet the state is rapidly expanding to add more of both.

In order for the Draft EMP to have any long-term viability and visibility of greenhouse gas emissions, it needs to mandate the following:

1. **Immediately start tracking all natural-gas fired power plants and compressor stations in New Jersey for all greenhouse gas emissions and provide monthly metrics report on the estimated (should include CO2, CH4, N20 and CO).** This starts the visibility of emissions, but it is only estimates provided by the companies.
2. **Provide a timeline for when actual real time measures of greenhouse gas emissions will be installed at each and every natural gas fired power plants and compressors in New Jersey.**
3. **Identify natural gas as a fossil fuel for New Jersey to eliminate and provide target reductions for 2025, 2030, 2035, 3040, 2045 and by 2050. There needs to be a clear path of transforming New Jersey energy infrastructure away from all fossil fuels to renewable energy sources.**
4. **Issue a moratorium on natural gas expansion immediately.**
   Natural gas is not a part of the 100% renewable energy goal. New Jersey needs to better understand current emissions and track emissions for all greenhouse gases. Don't use CO2e, break down the emissions by each greenhouse gas by fossil fuel source.

Methane emissions are rapidly increasing due to the natural gas growth. Many of the natural gas projects that impact New Jersey are often for other states (i.e. NESE and Meadowland are for New York). New Jersey went from garden state, to auto highway state and now to natural gas pipeline highway state. If New Jersey is serious about 2050 renewable energies, it needs to focus on monthly metrics of current emissions, consumption and sources and publish those monthly metrics every month to demonstrate current state and progress.

Natural gas is not clean energy. New Jersey is severely impacted from being used as the natural gas pipeline highway. The draft EMP was created to move away from fossil fuels. Please make sure it includes natural gas.

Thank you.

Kirk Frost

APPENDIX

Claimed estimate Chemical Emissions from proposed NESE pipeline expansion and Meadowland Power plant

Chemical Emission	NESE CS206	Meadowlands Power Plant	Metric
Methane (CH4)	33.41	73.0	Tons
Carbon dioxide (CO2)	130,864.00	3,500,000.0	Tons
Carbon Monoxide (CO)	57.40	423.3	Tons
(PM10)	18.90	190.8	Tons
(PM2.5)	18.90	185.6	Tons
Nitrous oxide (N2O)	3.29	305.3	Tons
Formaldehyde	668.60	17,942.0	Pounds
Ammonia	29,580.00	525,400.0	Pounds
1,3 Butadiene	0.94	112.0	Pounds
Acetaldehyde	87.84	*Not provided*	Pounds
Acrolein	14.06	372.0	Pounds
Benzene	26.36	998.0	Pounds
Ethylbenzene	70.26	*Not provided*	Pounds
Naphthalene	2.86	*Not provided*	Pounds
(PAH)	0.52	*Not provided*	Pounds
Propylene Oxide	63.68	*Not provided*	Pounds
Toluene	285.46	*Not provided*	Pounds
Xylenes	140.54	*Not provided*	Pounds
Sulfur dioxide (SO2)	3.10	52.5	Tons

Note that the Meadowlands powerplant doesn't include all of the chemicals that are byproducts of natural gas combustion.

NESE CS206 Turbines Exhaust Methane Yearly Emissions

Table 9.2-14 Operational Potential to Emit (tpy) –Compressor Station 206

Pollutant	Gas Compressor Turbines (tpy)[a]	Emergency Generator	Condensate Tank	Fugitive[b]	Blowdown	Total
CO	56.86	0.52	N/A	N/A	N/A	57.38
NO_x	22.74	0.26	N/A	N/A	N/A	23.00
VOC	8.35	0.13	1.00	0.43	0.26	10.17
PM_{10}	18.94	0.004	N/A	N/A	N/A	18.94
PM2.5	18.94	0.004	N/A	N/A	N/A	18.94
SO_2	3.07	0.0002	N/A	N/A	N/A	3.07
GHG as CO_2e	132,720	53	N/A	456	2,914	136,143
Ammonia	14.79	0.00	N/A	0.00	N/A	14.79

Note that Fugitive emissions is separate from turbine combustion emissions.

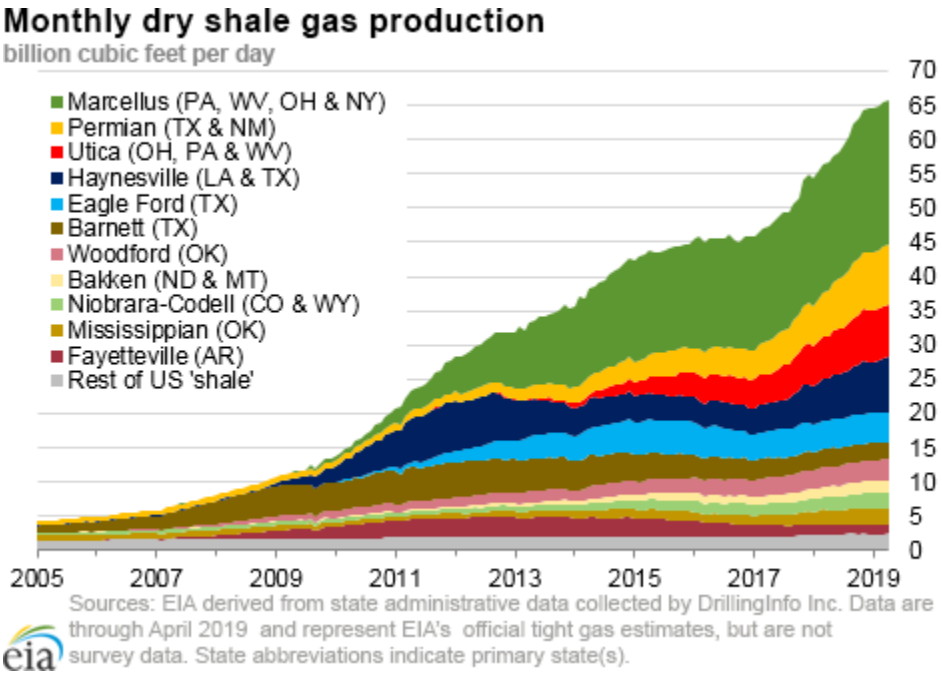
TABLE 3.2 POTENTIAL EMISSIONS FROM PROPOSED SOLAR TURBINES (TONS PER YEAR)
B. GHG Pollutants *(in exhaust emitted from smokestacks)*

Source	Operational Mode	CO_2	N_2O	CH_4	CO_2e
Two Solar Mars 100 Turbines	Normal (0 °F)	65,016.33	1.63	13.87	65,867.83
	Sub-Zero (0 to -20 °F)	335.90	0.01	0.07	340.29
	Start-up/Shutdown	79.58	0.01	2.76	151.82
	Total (2 turbines) =	**130,863.61**	**3.29**	**33.41**	**132,719.86**

Source: FERC CP17-101 3/27/2017 application document file 28 RR9

Based on FERC CP17-101 Application:

- **2 turbines will emit at least 33.41 tons of methane every year out through the 50-foot smokestacks.**
- **Mfct, Solar, states it can't guarantee turbines for this emissions threshold.**
- **Mfct test runs demonstrate high erratic output of GHGs & chemicals**



Proposed CS206 Yearly *Estimated* Emissions