

Northeast Supply Enhancement (NESE) Project is a Public Threat – not a Public Convenience

NJ Clean Energy Goals would be thwarted by NESE.

- NESE is one of a dozen currently proposed fossil fuel-burning projects in NJ.
 - Building it would not comport with Governor Murphy’s goals for increased clean energy and reduced greenhouse gas emissions.
 - Building it would guarantee reliance on fossil fuels for decades if NESE is built.
 - Operating NESE would create increased greenhouse gas and other toxic chemical emissions, and NJ is already an ozone-compromised region.
 - Most projects of Williams/Transco in NJ have been expanded within a few years.
 - Though the Marcellus Shale region has a lot of gas, NJ should not bear the safety & health risks of company profits to become the Pipeline State.
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Greenhouse Gas Emissions

According to NOAA / NASA, 2018 was the 4th warmest year on record (since 1880). “2018 is yet again an extremely warm year on top of a long-term global warming trend,” said GISS Director Gavin Schmidt.

Since the 1880s, the average global surface temperature has risen about 2 degrees Fahrenheit (1 degree Celsius). **This warming has been driven in large part by increased emissions into the atmosphere of carbon dioxide and other greenhouse gases caused by human activities**, according to Schmidt

Accessed at: <https://www.nasa.gov/press-release/2018-fourth-warmest-year-in-continued-warming-trend-according-to-nasa-noaa>

In 2016, the average global temperature was 1.69 degrees Fahrenheit above the average temperature for the 20th century, and the *rate* of change has nearly doubled in the past 50 years. A major driver of this rapid rise in global temperatures and the increasing instability of our climate is the use of fossil fuels. Of the fossil fuels we use, methane - the primary constituent of the gas that the NESE would transport - is 84 times more powerful a greenhouse gas in the first twenty years after its release than is the more commonly known greenhouse gas, carbon dioxide. If we are going to prevent the worst-case climate change scenarios, if we are going to hold the increase in global temperature well below 2 degrees Celsius (3.6 degrees Fahrenheit), we must transition rapidly away from fossil fuels and build our lives around renewable energy.

Impacts from increases in greenhouse gases include, but are not limited to:

- climate change’s effect on more frequent and severe weather events and rising sea levels,
- higher rates of flooding & associated diseases, mold, and emergency room visits, and
- economic impacts (fishing & tourism industries, lost time at school or work, and impairments to habitats & environment that would affect marinelife)

NESE's Applications & reviews clearly omitted assessing actual greenhouse gas (GHG) emissions, both initially and cumulatively, for the impact on Central New Jersey from Compressor Station 206.

- **Greenhouse Gas Equivalent (CO₂e) emissions = 136,143 tons per year**
Note: The threshold for comparing this to the Prevention of Significant Deterioration (PSD) threshold of 75,000 tons per year of emissions of 132,720 tons of Natural Gas Equivalent per year was not triggered because CS206 was not considered a major source for the NJDEP.
- **Methane (CH₄, most impacting GHG) - More than 33.41 tons every year**
Note: Any accounting for fugitive emissions (leaks) is likely grossly underestimated.
- **Carbon dioxide (CO₂) – claimed est. 130,943 tons every year**
- **Nitrous oxide (N₂O) – claimed est. 3.29 tons every year**
- **Exhaust Temperature & Velocity:** Compressor Station 206 would have two smokestacks, each emitting exhaust at a rate of 210,000 cubic feet per minute at a temperature greater than 849° Fahrenheit. There were no available studies of the impact of exhaust at this velocity, amount or temperature on the environment.
- It's old technology and, as confirmed by the manufacturer, combustion exhaust temperature increases at lower than 100% load along with emitting more unburned fuel and chemical byproducts.
- FERC does not account for GHG emissions upstream or downstream.

Reported emissions estimates for the Solar Mars 100 turbines proposed for Compressor Station 206 are not warranted by the turbine manufacturer, and they were not validated by FERC or NJDEP.

- As stated by the manufacturer of the Solar Mars 100 turbines - "non-warranted emissions of SO₂, PM_{10/2.5}, VOC, and formaldehyde."
- VOCs emissions are not warranted due to erratic operation turbine as confirmed by: "Any emissions warranty is applicable only for steady-state conditions." This actually refers to all emissions, and changes in turbine load produce erratic chemical emissions.

Williams/Transco noted that they have never used Selective Catalytic Reduction (SCR) technology on a Solar Mars 100 before, so the impact on pollution reduction cannot be adequately assessed.

- In the application to NJDEP for a Freshwater Wetlands Individual Permit (June 19, 2018), the Question and Answer document (page 13) notes: “Compressor Station 206 will be Transco’s first natural gas transmission compressor station to utilize SCR on the turbine driven compressors.”

**Northeast Supply Enhancement Project - Application to FERC – 3/27/17 (Resource Report 9)
FERC Accession No. 20170327-5102(32053902) Pages 9-30 & 9-31**

Table 9.2-14: Operational Potential to Emit – Tons per Year (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
PM _{2.5}	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 CO₂e	132,720	53	N/A	456	2,914	136,143*
Ammonia	14.79	0.00	N/A	0.00	N/A	14.79
Formaldehyde (largest single HAP emitted from gas turbines)	0.33	0.02	N/A	0.00	0.00	0.35
Total HAPs	0.68	0.02	N/A	0.01	0.00	0.71

^a Includes annual PTE for two gas turbines in normal operational mode, sub-zero mode and startup/shutdown mode

^b Fugitive emissions from pipeline valves and flanges within Compressor Station 206.

Key:

- CO = Carbon monoxide
- CO₂e = Carbon dioxide equivalent
- GHG = Greenhouse gas
- HAPs = Hazardous air pollutants
- N/A = Not applicable – pollutant not produced by this source
- NO_x = Nitrogen oxide
- PM₁₀ = Particulate matter less than or equal to 10 microns in diameter
- PM_{2.5} = Particulate matter less than or equal to 2.5 microns in diameter
- PSD = Prevention of significant deterioration
- SO₂ = Sulfur dioxide
- tpy = Tons per year
- VOC = Volatile organic compound

*** In the FEIS (1/25/19), FERC’s Table 4.10.1-5 listed the total GHG as CO₂e as 140,935 ton per year.**

In the DEIS, it is also noted that the Potential to Emit for Carbon Dioxide (CO₂) is 130,943 tons per year, based on continuous operation of 8,760 hours per year (365 days/year). (Table 3.5-2, page 3-41)

Methane is the main component of natural gas, and its impact on the climate is more severe than that of carbon dioxide.

It is argued that methane is a short-lived pollutant and therefore should be treated differently. However, "short-lived" is relative. Methane stays in the atmosphere for an average of nine years, which, according to the latest IPCC report, is about the timeframe humanity has to stabilize greenhouse gas emissions in order to avoid the worst impacts of global climate change. Additionally, methane is a much more potent greenhouse gas than CO₂, producing 84 times the global warming potential (GWP) of an equivalent weight of CO₂ over a 20-year period.

Even over CO₂'s average 100-year lifetime in the atmosphere, methane yields 25 to 32 times the global warming potential of CO₂. Nitrous oxide is worse still, creating 298 times the global warming potential of CO₂ over a 100-year period, as well as causing depletion of stratospheric ozone, leading to more sun burns and skin cancer.

In short, methane and nitrous oxide are much worse greenhouse gases than CO₂, especially when we consider the speed with which we need to act. CO₂ is only the most damaging greenhouse gas emission because there is so much more of it emitted worldwide.

Also to note - Natural gas may not be the "transition" fuel that some think it is. It emits half the amount of carbon as coal, but if as little as 3.5 percent of its methane is released, it pollutes worse than coal. Also - data on methane release are scarce.

Methane Leaks are not accounted for in the NESE application documents.

- Methane leaks from compressor station + pipelines (unintentional equipment malfunctions & intentional releases from valves) are not monitored carefully, or reported. Without use of infrared camera surveying / optical gas imaging / special sensors, the real amount will likely never be known. EPA estimates a 1.4% leak rate, but a recent actual study found that the methane leak rate is 2.3%.
- A new study, [published on June 21, 2018 in the journal Science](#), puts the rate of methane emissions from domestic oil and gas operations at 2.3 percent of total production per year, which is 60 percent higher than the current estimate from the Environmental Protection Agency. That might seem like a small fraction of the total, but it represents an estimated 13 million metric tons lost each year, or enough natural gas to fuel 10 million homes. It would be worth an estimated \$2 billion. This much leaked methane would have roughly the same climate impact in the short-term as emissions from all U.S. coal-fired power plants, the authors found.
- Methane is a highly potent greenhouse gas, with more than 80 times the climate warming impact of carbon dioxide over the first 20 years after it is released.
- **An earlier EDF study** showed that a methane leak rate of greater than 3 percent would result in no immediate climate benefits from retiring coal-fired power plants in favor of natural gas power plants.
- There should be an emphasis on measuring methane emissions (not just carbon dioxide) in state's efforts to reduce greenhouse gas.
- We are in an ozone nonattainment zone, and methane leaks contribute to ozone.

Methane leakage has been underestimated in reports by industry.

See, for example:

R. A. Alvarez et al., Science 10.1126/science.aar7204 (2018 June 21). Assessment of methane emissions from the U.S. oil and gas supply chain. Accessed at:
<http://science.sciencemag.org/content/early/2018/06/20/science.aar7204/tab-pdf>

Voiland, A. (2016 March 8). Methane matters: Scientists work to quantify the effects of a potent greenhouse gas. Accessed at:
<https://earthobservatory.nasa.gov/Features/MethaneMatters/printall.php>

Impacts of increased greenhouse gas emissions were not accounted for by any agency reviewing NESE's application and environmental impact documents.

- NESE would significantly worsen climate change impacts in the region due to greenhouse gas emissions from drilling, producing, transporting and burning of natural gas. It is apparent from recent global and U.S. reports, listed below, that consideration of impacts from greenhouse gases is urgent.
- Recent reports have clearly shown how emissions from natural gas-fired compressors are dangerous, toxic and highly damaging to the environment and our health, and impacts from the NESE Project were not identified or independently examined by FERC as long-term or cumulative health impacts in the EISs.

And yet, FERC refuses to connect the NESE Project to the risk of climate change even though they note, in the FEIS, that “Construction and operation emissions from the NESE Project would increase the atmospheric concentration of GHGs, in combination with past and future emissions from all other sources, and contribute incrementally to future climate change impacts.” FERC lists many documented impacts of climate change in the FEIS. However, in the FEIS, FERC claims that, “there is no widely accepted standard, per international, federal, or state policy, or as a matter of physical science, to determine the significance of the Project’s GHG emissions.” In other words, FERC has declined to weigh climate change in the balance when deciding whether or not to grant Williams/Transco a permit to proceed.

But the claim that there is no standard for determining a project’s greenhouse gas emissions is false. Three peer-reviewed, well-cited Integrated Assessments Models (IAMs) for determining the social cost of carbon exist. After the DEIS was released, FERC was informed about these models by a detailed report co-authored by leading environmental and legal authorities. Moreover, the report also made it clear that FERC has a legal obligation to weigh the impact of climate change under the National Environmental Policy Act (NEPA). The report stresses that the “uncertainty about the full effects of climate change raises the social cost of greenhouse gases and warrants more stringent climate policy.” There are methods for determining the impact of greenhouse gas emissions, and FERC must use them when weighing whether or not to permit a project like NESE to go forward. Indeed, in *Sierra Club v. FERC*, a recent D.C. Circuit Court affirmed that FERC *must* evaluate the impacts of greenhouse gas emission when assessing a project.

Source: FERC Accession No. submissions 20180514-6016(32884460) & (32884461) by New York University School of Law’s Institute for Policy Integrity with the Environmental Defense Fund, National Resources Defense Council, Sierra Club, and the Union of Concerned Scientists.

The cost of weather/climate-related disasters is mostly borne by taxpayers and people who are directly impacted but not involved in decision-making policies about the production and transportation of carbon-intensive goods. According to the National Oceanic and Atmospheric Administration (NOAA), economic costs in the U.S. from the 16 weather/climate-related disasters in 2017 were \$309.5 billion. This exceeded the previous record by over \$100 billion - For 2005, from Hurricanes Dennis, Katrina, Rita & William, CPI-adjusted costs to present dollars were \$219.2 billion. The number of weather/climate-related disasters in the U.S. in 2017 tied the number from 2011, but the actual isolated events in 2017 were arguably more because wildfires were counted as regional-scale, seasonal events and not as multiple isolated events.

Source: www.ncdc.noaa.gov/billions

In 2018, there were 14 weather and climate disaster events with losses exceeding \$1 billion each across the United States. These events included 1 drought event, 8 severe storm events, 2 tropical cyclone events, 1 wildfire event, and 2 winter storm events. Overall, these events resulted in the deaths of 247 people and had significant economic effects on the areas impacted. The 1980–2018 annual average is 6.2 events (CPI-adjusted); the annual average for the most recent 5 years (2014–2018) is 12.6 events (CPI-adjusted).

During 2018, the U.S. experienced an active year of billion-dollar disaster events including the 4th highest total number of events, only behind the years 2017, 2011 and 2016. In 2018, the U.S. also experienced the 4th highest total costs (\$91 billion) only behind the years 2017, 2005 and 2012.

Source: NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2019). <https://www.ncdc.noaa.gov/billions/>

Greenhouse Gas Emissions - Relevant Reports:

- October 7, 2018 - comprehensive assessment by the Intergovernmental Panel on Climate Change (IPCC) released in Incheon, South Korea. Accessed at: <https://www.ipcc.ch/report/sr15/>
IPCC, 2018: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skeea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)]. In Press.
- November 23, 2018 - A new federal report finds that climate change is affecting the natural environment, agriculture, energy production and use, land and water resources, transportation, and human health and welfare across the U.S. and its territories. Accessed at: <https://nca2018.globalchange.gov/>
Volume II of the Fourth National Climate Assessment (NCA4), released Nov. 23, 2018 by the United States Global Change Research Program (USGCRP -- <http://www.globalchange.gov/about>), focuses on climate change impacts, risks and adaptations occurring in the U.S. The report contains supporting evidence from 16 national-level topic chapters (e.g., water, oceans, energy, and human health), 10 regional chapters and two chapters that focus on societal responses to climate change. NOAA is one of 13 federal agencies that contributed significantly to the Fourth National Climate Assessment. USGCRP also released the Second State of the Carbon Cycle Report (SOCCR2 -- <https://carbon2018.globalchange.gov/>).

Some Other Relevant Resources & References about Greenhouse Gas Emissions:

The greenhouse gas impacts of proposed natural gas pipeline buildout in New York – PSE for Earthworks (February 2018). Accessed at: <https://www.psehealthyenergy.org/wp-content/uploads/2018/02/NY.Pipelines-1.pdf>

Ridlington, E. (Frontier Group) and Madsen, T. (Environment America Research & Policy Center). (Spring 2017) Our Health at Risk – Why are millions of Americans still breathing unhealthy air? Environment New Jersey Research & Policy Center. Accessed at: <https://environmentnewjersey.org/sites/environment/files/reports/Our%20Health%20at%20Risk%20vNJ%20web.pdf>

Shankman, S. and Horn, P. (3 October 2017) The most powerful evidence climate scientists have of global warming. Accessed at: https://insideclimatenews.org/news/03102017/infographic-ocean-heat-powerful-climate-change-evidence-global-warming?utm_source=Inside+Climate+News&utm_campaign=31b399ba86-Weekly+Newsletter&utm_medium=email&utm_term=0_29c928ffb5-31b399ba86-327817337

NATIONAL SECURITY: Long-Range Emerging Threats Facing the United States As Identified by Federal Agencies. (December 2018) GAO-19-204SP, a report to congressional committees from the US Government Accountability Office. Accessed at: <https://www.gao.gov/assets/700/695981.pdf>