



THE PENNEAST PIPELINE: GREENHOUSE GAS EMISSIONS BRIEFING

FACTS AT A GLANCE

Total Annual GHG Emissions: 49 million metric tons
Emissions Equivalent: 14 coal plants or 10 million passenger vehicles

Project Name: PennEast Pipeline
Ownership: PennEast Pipeline Company, LLC. Joint Venture Partners are: NJR Pipeline Company (20%); SJI Midstream LLC (20%); Southern Company Gas (formerly AGL Resources) (20%); UGI Energy Services (20%); Spectra Energy Partners LP (owned by Enbridge) (10%)*; PSEG Power LLC (10%)
Operator: PennEast Pipeline Company, LLC
Pipeline Length: 120 miles
Pipeline Diameter: 36 inches
Pipeline Capacity: 1.1 billion cubic feet per day (Bcf/d)
Project Cost (Est.): \$1 billion
States Affected: Pennsylvania and New Jersey
Gas Source: Pennsylvania, Marcellus Formation, Appalachian Basin
Pipeline Route: From Luzerne County in northeastern Pennsylvania, southeast through Pennsylvania, crossing the Delaware River into New Jersey east of Allentown, Pennsylvania, and terminating at the Transco pipeline interconnection north of Trenton in Mercer County, New Jersey.
Destination Markets: Pennsylvania and New Jersey, and surrounding states
Permit and Project Schedule (Est.): Final EIS (April 2017); FERC permit (July 2017); Construction (2018-2019)

*PSEG is in process of selling its ownership stake to Spectra, which would raise Spectra's stake to 20%.

PENNEAST PIPELINE OVERVIEW

The PennEast Pipeline is a proposed interstate natural gas pipeline that would run about 120 miles from northeastern Pennsylvania, southeast through Pennsylvania, and across the Delaware River into New Jersey, terminating north

of Trenton. The pipeline would bisect the Delaware River watershed, crossing major rivers like the Susquehanna and the Delaware and threatening forests, vital habitats for endangered species, farmland, communities, and drinking water supplies

all along its path. The project is facing stiff opposition from affected landowners, community and environmental groups, and townships along its route through Pennsylvania and New Jersey.¹

Above: Construction of Columbia's Line MB Extension in Maryland. ©Sierra Shamer, FracTracker Alliance

¹ See <https://stoppeneast.org/> for county-by-county updates on opposition to the project.

The project backers are a consortium of gas companies including NJR, an affiliate of New Jersey Natural Gas, Southern Company Gas, UGI Energy Services, SJI Midstream, and Spectra Energy Partners (now owned by Enbridge). All of the joint venture partners will control an equal 20 percent stake in PennEast Pipeline LLC, the umbrella corporation that will own and operate the pipeline, once PSEG Power concludes the sale of its ownership stake to Spectra Energy.

A majority of the pipeline's 1.1 Bcf/d capacity is under contract to affiliates of the joint venture partners. The New Jersey Rate Counsel, an independent state agency that represents the interests of utility customers, has concluded that the project backers have failed to demonstrate actual need for the gas.² The pipeline will terminate at the existing Transco Pipeline (owned by Williams), which serves markets from New Jersey to Texas.

The Federal Energy Regulatory Commission (FERC) released its Final Environmental Impact Statement (FEIS) for the PennEast Pipeline on April 7, 2017, after about four months of delay.³ FERC could issue its permit by July 2017. PennEast has said it aims to complete construction in the second half of 2018. However, in addition to permits from FERC and the Army Corps of Engineers, the pipeline company still needs additional permits from the states of New Jersey and Pennsylvania and the Delaware River Basin Commission. The company originally hoped to have the project operational in 2017.⁴

Climate science clearly indicates that we need to reduce consumption of all fossil fuels and make a just transition to a clean energy economy.⁵ Building major gas pipelines today will undermine action to protect our climate because pipelines increase access to gas that we cannot afford to burn. Increasing gas supply and use exacerbates climate change.



- ▶ **Producing electricity from gas is currently dirtier than coal-fired power because methane leakage along the gas supply chain more than doubles the lifecycle emissions of gas compared to just counting emissions from gas combustion.**
- ▶ **Current methane leakage reduction goals are not enough to make up for the projected increase in gas use.**
- ▶ **To achieve climate goals, we need a total transition away from fossil fuels by mid-century.**
- ▶ **Each new pipeline from the Appalachian Basin will trigger new gas production.**
- ▶ **Each new pipeline will trigger additional demand for gas-fired power that could be met with clean energy sources and demand management.**

For fully referenced details of the above points see Oil Change International's [Gas Pipeline Climate Methodology](#).⁶

For these reasons, the PennEast Pipeline will contribute significant amounts of greenhouse gases (GHGs) that lead to climate change.

2 New Jersey Division of Rate Counsel, "Comments of the New Jersey Division of Rate Counsel under CP15-558 (Draft Environmental Impact Statement for the PennEast Pipeline LLC)," Federal Energy Regulatory Commission, September 12, 2016, pages 2-8. https://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20160912-6003

3 FERC's Final Environmental Impact Statement on the PennEast Pipeline, issued on April 7, 2017, is available at: <https://www.ferc.gov/industries/gas/enviro/eis/2017/04-07-17-FEIS.asp>

4 Christina Tatu, "Federal decision on PennEast pipeline delayed again," The Morning Call, January 23, 2017. <http://www.mcall.com/news/breaking/mc-penn-east-environmental-impact-delay-20170123-story.html>

5 Oil Change International, "The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production," September 2016. http://priceofoil.org/content/uploads/2016/09/OIL_the_skys_limit_2016_FINAL_2.pdf

6 Oil Change International, "Gas Pipeline Climate Methodology: Calculating Greenhouse Gas Emissions for Natural Gas Infrastructure." February 2017. <http://priceofoil.org/2017/02/08/gas-pipeline-climate-methodology>

PENNEAST PIPELINE ANNUAL EMISSIONS TOTAL 49 MILLION METRIC TONS

We estimate the full lifecycle greenhouse gas emissions of the PennEast Pipeline using Oil Change International's [Gas Pipeline Climate Methodology](#) (see Footnote 6).

The annual greenhouse gas emissions caused by the PennEast Pipeline would be over 49 million metric tons. This is equivalent to the emissions from 14 average U.S. coal plants or over 10 million passenger vehicles.⁷

Additional emissions are caused by changes in vegetation cover in the pipeline corridor. Construction of the pipeline would affect an estimated 601 acres of forest and 36 acres of wetlands, resulting in loss of carbon stock.¹¹

REDUCED METHANE LEAKAGE LOWERS EMISSIONS - BUT ONLY BY A MAXIMUM 22 PERCENT

In May 2016, the U.S. Environmental Protection Agency announced standards

alone will not achieve the stated Obama administration goal to reduce methane emissions from the oil and gas sector by 45 percent from 2012 levels by 2025.¹³ While the Trump administration has initiated action to roll back the methane goals, it remains important to understand what impact these reductions would have should they be implemented.

Assuming a 45 percent reduction does occur across the gas supply chain, we find that the total annual emissions could be cut by a maximum of 10.8 MMT to a total of 38.3 MMT. This is a reduction of 22 percent of the total emissions without methane leakage reductions. The remaining emissions are equivalent to 11 average U.S. coal plants or 8 million average passenger vehicles.¹⁴

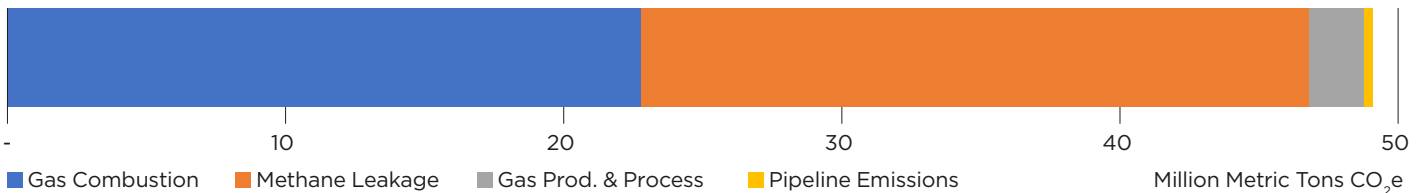
The annual emissions come from four sources:⁸

- Emissions from the combustion of the gas the pipeline would carry = 22.8 MMT CO₂e
- Emissions from methane leaked across the gas supply chain = 24 MMT CO₂e⁹
- Emissions from extraction (i.e. fracking wells) and processing of the gas = 2 MMT CO₂e
- Emissions from pipeline operation = 0.26 MMT CO₂e*

This estimate does not include construction emissions, which according to FERC, would amount to 34,878 short tons over approximately one year of preparation and construction.¹⁰

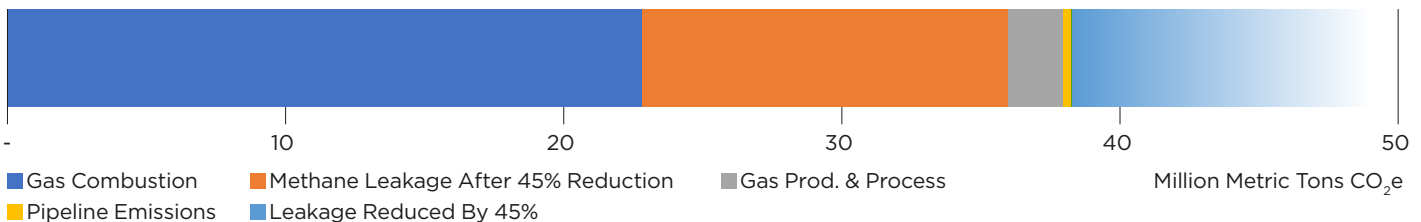
for reducing methane leakage from the oil and gas sector.¹² The standards affect new, modified and reconstructed production wells, while existing wells are being assessed for further action. This rule

Figure 1. PennEast Pipeline Annual GHG Emissions



Source: Oil Change International using IPCC, PSE, FERC and Santoro et al. See [Gas Pipeline Climate Methodology](#) (see Footnote 6)

Figure 2. PennEast Pipeline Annual GHG Emissions with Methane Reduction Goal



Source: Oil Change International using IPCC, PSE, FERC and Santoro et al. See [Gas Pipeline Climate Methodology](#) (see Footnote 6)

*Compressor station emissions figures based on FERC FEIS and may underestimate methane and other GHG emissions.

7 U.S. Environmental Protection Agency, "Greenhouse Gas Equivalencies Calculator." <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>
 8 MMT = Million Metric Tons. Figures are rounded.
 9 CO₂e = Carbon dioxide equivalent. Since the measurement and analysis of GHGs is based on CO₂, the impact of methane on the atmosphere is expressed as a carbon dioxide equivalent. We convert methane leakage to CO₂e by converting methane volume to mass and then multiplying by the 20-year global warming potential (GWP) of methane (see Footnote 25).
 10 Federal Energy Regulatory Commission, "PennEast Pipeline Project, Final Environmental Impact Statement. Volume I, Docket No. CP15-558-000. FERC\EIS: 0271F," April 7, 2017, Table 4.12.4-1, p. 4-333. Figure amounts to 31,641 metric tons. <https://www.ferc.gov/industries/gas/enviro/eis/2017/04-07-17-FEIS.asp>
 11 See the FERC PennEast FEIS at Table 4.4.2-1, pp. 4-80 - 4-81 for wetlands impacts, and p. 4-88 for forest impacts: <https://www.ferc.gov/industries/gas/enviro/eis/2017/04-07-17-FEIS.asp>
 12 U.S. Environmental Protection Agency, "EPA Releases First-Ever Standards to Cut Methane Emissions from the Oil and Gas Sector," May 12, 2016. <https://www.epa.gov/newsreleases/epa-releases-first-ever-standards-cut-methane-emissions-oil-and-gas-sector>
 13 The White House, "Fact Sheet: Administration Takes Steps Forward on Climate Action Plan by Announcing Actions to Cut Methane Emissions," January 14, 2015. <https://obamawhitehouse.archives.gov/the-press-office/2015/01/14/fact-sheet-administration-takes-steps-forward-climate-action-plan-anno-1>
 14 U.S. Environmental Protection Agency, "Greenhouse Gas Equivalencies Calculator." <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

FERC CLIMATE ANALYSIS INADEQUATE

FERC is the primary federal agency that assesses the need for and impacts of interstate gas pipelines, and issues permits for construction and operation.¹⁵ In the Final Environmental Impact Statement for the PennEast Pipeline, the assessment of greenhouse gases emitted by the project is woefully inadequate and based on assumptions devoid of evidence.¹⁶

The FEIS lists GHG emissions from construction and operation (noted above), but fails to discuss upstream emissions from gas extraction and processing at all. FERC does calculate downstream emissions from gas combustion but then dismisses these as “an upper bound of potential”¹⁷ based primarily on “the possibility of fuel-switching from coal or other fossil fuel combustion as a result of additional gas supply.”¹⁸

FERC then dismisses the substantial impact of methane leakage by referring only to “fugitive pipeline leaks”¹⁹ from the project alone rather than adding up methane leakage from the entire gas supply chain. The FEIS argues that methane leaks would increase potential emissions from the project by a mere 0.05 percent. This is a gross misrepresentation of the scope of the methane problem that conveniently allows FERC to conclude that there is no methane problem to be concerned about.

Our critique of this ‘analysis’ rests on three factors:

- **Upstream emissions are both relevant and calculable;**
- **Methane leakage undermines any benefit of fuel switching to gas;**
- **No evidence is presented that any fuel switching would occur as a result of the project.**



UPSTREAM EMISSIONS ARE BOTH RELEVANT AND CALCULABLE

The FEIS dismisses calls for estimates of lifecycle GHG emissions stating that, “We conclude that the scope and effects of the potential GHG emissions from natural gas productiona [sic.] attributable to this Project are not reasonably foreseeable, as there is not enough information available to permit a meaningful analysis.”²⁰ This is not only untrue but inconsistent with recent statements by FERC.

In a Certificate Order issued by FERC for the Rover Pipeline in February 2017, FERC referred to a Department of Energy (DOE) report to roughly estimate upstream emissions for that project.²¹ The DOE report is outdated and inadequate

and FERC’s use of it was perfunctory.²² Nonetheless, FERC acknowledged that it is possible to come to an estimate using third party studies of lifecycle emissions. It should progress toward a full lifecycle estimate of emissions using the latest research and data, rather than going back to dismissive statements with no basis in fact.

On the PennEast Pipeline specifically, the Delaware Riverkeeper Network conducted an analysis of the reasonably foreseeable increase in gas production that the project could trigger, finding that the pipeline could support the drilling of 3,000 new wells in Pennsylvania.²³ There is no reason FERC could not conduct a similar estimate of new production and then estimate the corresponding emissions.

¹⁵ See Federal Energy Regulatory Commission, “Natural Gas,” FERC Website, <https://www.ferc.gov/industries/gas.asp>

¹⁶ Federal Energy Regulatory Commission, “PennEast Pipeline Project, Final Environmental Impact Statement, Volume I. Docket No. CP15-558-000. FERC\EIS: 0271F,” April 7, 2017. (FERC FEIS) <https://www.ferc.gov/industries/gas/enviro/eis/2017/04-07-17-FEIS.asp>

¹⁷ FERC FEIS at 4-334

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Federal Energy Regulatory Commission, “Order Issuing Certificates,” February 2, 2017, pp. 101-102, <https://www.ferc.gov/CalendarFiles/20170202210009-CP15-93-000a.pdf>

²² We critique FERC’s comments on Rover emissions in a forthcoming briefing on that issue. See www.priceofoil.org for updates.

²³ Delaware Riverkeeper Network, “Comment of Delaware Riverkeeper Network on DEIS under CP15-558,” Federal Energy Regulatory Commission, September 12, 2016, pgs. 22-30. https://elibrary.ferc.gov/idmws/file_list.asp?document_id=14495483



Oil Change International developed a [Gas Pipeline Climate Methodology](#) (see Footnote 6) to help assess lifecycle emissions from gas pipeline projects. It uses third party research to come to an assessment of average likely emissions. We recognize that as new data and analysis emerge on the complex issues surrounding estimates of these emissions, some figures may change. However, FERC is clearly incorrect to assert that insufficient information is available to conduct an adequate estimate.

METHANE LEAKAGE UNDERMINES ANY BENEFIT OF FUEL SWITCHING TO GAS

As noted above, the FEIS asserts that its estimate of downstream emissions is an “upper bound” because of the potential for fuel switching from a dirtier fossil fuel, primarily coal. This assertion, which is made without any evidence, ignores the clear evidence that gas can be as dirty or dirtier than coal due to high levels of leakage of methane, a highly potent greenhouse gas.

Analysts at PSE Healthy Energy have calculated that at leakage rates above 2.8 percent of gross production, electricity generated with gas can be as dirty as coal.²⁴ They estimate that average leakage across the U.S. supply chain may be as high as 3.8 percent. We use the 3.8 percent leakage rate in the calculation of emissions for the pipeline combined with the 20-year global warming potential of methane from the latest climate science reports.²⁵

In Figure 2 above we assume methane leakage can be reduced by 45 percent, bringing the leakage rate potentially down to 2.1 percent of production. In either calculation, it is clear that fuel switching to gas for power generation does not bring a substantial reduction in GHG emissions considering the dramatic emissions reductions required to meet climate goals.²⁶ This of course assumes that fuel switching is actually occurring.

WOULD FUEL SWITCHING OCCUR AS A RESULT OF THE PROJECT?

FERC presents no evidence whatsoever to support an assumption that fuel switching from dirtier fuels is an inevitable consequence of building the project. In New Jersey where the project terminates, coal has virtually been eliminated from the generation mix and the state has been identified as already being over-reliant on natural gas for power generation.²⁷ Residential gas demand is also projected to be in decline due to increasing efficiency.

Indeed, the New Jersey Rate Counsel, an independent state agency that represents the interests of utility customers, has concluded that the project backers have failed to demonstrate actual need for the gas the pipeline would carry.²⁸

Nationally, we are witnessing tremendous changes in the competition between power generation sources. As a result, assumptions that gas competes only with coal must be discarded.²⁹ As the cost of clean energy continues to decline, we can just as easily assume that clean energy and efficiency compete with legacy coal capacity and that adding gas capacity may come at the cost of cleaner energy sources. Therefore, FERC’s assumption – that GHG emissions from a new gas pipeline are insignificant because of potential fuel switching – is illegitimate. It cannot form the basis of a climate impact assessment.

It is time for FERC to abandon its assumptions about gas development and acknowledge that more gas pipeline capacity leads to more GHG emissions.

24 PSE Healthy Energy, Science Summary, November 2015, “Climate Impact of Methane Losses from Modern Natural Gas and Petroleum Systems,” November 2015. http://www.psehealthyenergy.org/data/SS_Methane_Nov2015Final.pdf
25 We use a GWP of 86 derived from IPCC 5AR. Full reference: Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Table 8.7 P. 714. http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter08_FINAL.pdf
26 Oil Change International, “The Sky’s Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production,” September 2016. http://priceofoil.org/content/uploads/2016/09/OCI_the_skys_limit_2016_FINAL_2.pdf
27 Union of Concerned Scientists, “Rating the States on Their Risk of Natural Gas Overreliance,” October 2015. www.ucsusa.org/clean-energy/rating-the-states-on-their-risk-of-natural-gas-overreliance
28 New Jersey Division of Rate Counsel, “Comments of the New Jersey Division of Rate Counsel under CP15-558 (Draft Environmental Impact Statement for the PennEast Pipeline LLC),” Federal Energy Regulatory Commission, September 12, 2016, pages 2-8. https://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20160912-6003
29 Rachel Fakhry and Sophie Harrison, “Clean Energy and Efficiency Can Replace Coal for a Reliable Modern Electricity Grid,” Natural Resources Defense Council, March 2017. <https://www.nrdc.org/resources/clean-energy-and-efficiency-can-replace-coal-reliable-modern-electricity-grid>

CONCLUSIONS AND RECOMMENDATIONS

This briefing provides a calculation and discussion of the greenhouse gas emissions and climate impact of the proposed PennEast Pipeline. The assessment utilizes Oil Change International's [Gas Pipeline Climate Methodology](#) (see Footnote 6), which also expands on why calculating the full lifecycle emissions of gas pipeline projects is crucial for assessing the true impacts of such projects.

This information is a vital counterweight against the barrage of misinformation coming from the energy industry and many parts of the government that claim that the expansion of natural gas production and use helps to address climate change. This so-called bridge to clean energy argument has been entirely debunked. If gas ever did form a bridge to a clean energy transition, it is clear today that we have already crossed it and it is time to move on.

We recommend the following actions for citizens fighting the PennEast Pipeline.

- 1. **File written comments with FERC (Docket No. CP15-558-000) stating the annual emissions for the pipeline and urging the agency to reject the project's permit based on its significant climate impact and the lack of demonstrated need.**³⁰
- 2. **Contact your federal Congressional representatives in New Jersey and Pennsylvania and urge them to request that FERC reject the permit.**
- 3. **Contact the New Jersey Department of Environmental Protection, the Delaware River Basin Commission, and the Pennsylvania Department of Environmental Protection and urge them to reject permits for the project due to its unacceptable climate and environmental impacts.**³¹
- 4. **Join the nationwide call to [#keepitintheground](#) and reject all new fossil fuel infrastructure.**³²
- 5. **Get involved with one of the numerous non-profit or citizen groups fighting the PennEast project.**

Organizations Fighting the PennEast Pipeline:

[Berks Gas Truth](#)
[Clean Water Action New Jersey](#)
[Concerned Citizens Against the PennEast Pipeline](#)
[Delaware Riverkeeper Network](#)
[Environment New Jersey](#)
[HALT PennEast \(Homeowners Against Land Taking\)](#)
[New Jersey Chapter of the Sierra Club](#)
[New Jersey Conservation Foundation / Rethink Energy NJ](#)
[Peace-Youth](#)
[Save Carbon County](#)

Written by Lorne Stockman and Kelly Trout
For questions on gas pipeline GHGs, contact
Lorne Stockman: [lorne \[at\] priceofoil.org](mailto:lorne[at]priceofoil.org)



Oil Change International is a research, communications, and advocacy organization focused on exposing the true costs of fossil fuels and facilitating the coming transition towards clean energy.
Website: www.priceofoil.org Contact: info@priceofoil.org



The Bold Alliance is a network of small but mighty groups protecting land and water.
Website: www.boldalliance.org Contact: info@boldalliance.org

³⁰ For a guide on submitting comments to FERC online see: <http://wildvirginia.org/wp-content/uploads/2014/10/Guide-to-Commenting.pdf>. Don't forget to use the correct docket number for the PennEast project: CP15-558-000.

³¹ In addition to the FERC permit, the pipeline companies still need permits from both the New Jersey and Pennsylvania Departments of Environmental Protection (DEP) and from the Delaware River Basin Commission. The New Jersey DEP has raised significant concerns about the pipeline and, unlike the Pennsylvania DEP, has yet to issue a crucial 401 Water Quality Certificate for the project. Rejection of the 401 certificate is how the state of New York stopped construction of the Constitution Pipeline in spring 2016.

³² Learn more and take action at: <http://keepitintheground.org/appalachian-gas>