



New York's ENERGY CROSSROADS

How the state's climate goals clash
with natural gas infrastructure

February 2018



EARTHWORKS

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BY NADIA STEINZOR AND AARON MINTZES, EARTHWORKS
Report available at earthworksaction.org/nyenergyxroads

COVER PHOTOS:

Solar panel and wind turbine; istock.com/studio-fi

Pipeline venting station, Washington County PA; Earthworks

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EARTHWORKS

Offices in Colorado, California, Maryland, Montana, New York State and Texas

EARTHWORKS • 1612 K St., NW, Suite 904 Washington, D.C., USA 20006 • earthworksaction.org
202.887.1872 • Report available at earthworksaction.org/nyenergyxroads

Earthworks is dedicated to protecting communities and the environment from the adverse impacts of mineral and energy development while promoting sustainable solutions.

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Glossary

BACT: Best Available Control Technology

CO₂e: Carbon Dioxide equivalent

CAA: Clean Air Act

CEQ: Council on Environmental Quality

CPCN: Certificate of Public Convenience and Necessity

CTGs: Control Techniques Guidelines

CWA: Clean Water Act

EPA: Environmental Protection Agency

FERC: Federal Energy Regulatory Commission

GHG: Greenhouse Gas

GWP: Global Warming Potential

LAER: Lowest Achievable Emissions Rate

LDAR: Leak Detection and Repair

NEPA: National Environmental Policy Act

NY DEC: New York Department of Environmental Conservation

NYSERDA: New York State Energy Research and Development Authority

PSE: Physicians, Scientists, and Engineers for Healthy Energy

RACT: Reasonably Available Control Technology

SEQRA: State Environmental Quality Review Act (New York)

VOC: Volatile Organic Compound



Executive Summary

In his most recent energy plan, Governor Cuomo set ambitious goals to reduce the state's greenhouse gas (GHG)¹ emissions 40% below 1990 levels by 2030. To prepare, in 2017 several New York state agencies released a Methane Reduction Plan describing initial steps needed to achieve these GHG reduction goals, including in the oil and gas sector. Also in 2017, the state Department of Environmental Conservation (DEC) announced the intention to develop new regulations to control oil and gas air pollution.

With these plans in mind, New York officials and agencies also face important choices on how to stop or limit GHG emissions from the impending buildout of natural gas pipelines, compressor stations, and other natural gas infrastructure across the state.

To help inform those choices, Earthworks commissioned Physicians, Scientists, and Engineers for Healthy Energy (PSE) to answer this question: **"If proposed natural gas pipelines and associated infrastructure are built and used at current average rates, can the Cuomo Administration achieve its 2030 GHG reduction targets?"** In short, the answer is a resounding no.

PSE calculated lifecycle GHG emissions from ten pipelines proposed for New York, as well as nine compressor stations (both new and upgrades) and five meter and regulator (M&R) stations associated with those pipelines. PSE's analysis shows that the combination of additional methane leakage from pipelines, in-state emissions from compressor stations, and out-of-state emissions from gas production, combustion, and processing to supply New York consumers would effectively put the 40% reduction by 2030 target out of reach.

However, DEC and Governor Cuomo possess considerable legal and regulatory authority to prevent the gas infrastructure buildout and greatly limit the air quality and climate impacts of any pipelines and infrastructure that are constructed and operate in the state.

According to PSE's analysis, DEC has placed on hold (i.e., denied permits for) projects that represent more than 40% of projected emissions from the proposed gas infrastructure buildout. Yet, at the same time, DEC has not fully exercised its state authority to limit pollution and require that operators use far more protective air emissions controls for new gas projects.

This report describes the choices that New York decisionmakers face and outlines possible paths forward in confronting proposals to expand gas transportation and delivery infrastructure. With the PSE analysis in hand, we further recommend policy levers available to the state to improve chances at meeting the goal of 40% GHG reduction below 1990 levels by 2030. This report does not analyze in detail related efforts to reduce overall GHG emissions

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In short, the answer is a resounding no.



from other methods such as increases in energy efficiency, renewable energy, and reductions in demand.

Based on our research for this report we recommend that Governor Cuomo and DEC use a blend of permitting, regulation, and enforcement to stop or limit the pipeline and infrastructure buildout to prevent new sources of emissions—giving New York a far better chance of reaching its GHG reduction goals. [In particular, Governor Cuomo, elected officials, and state agencies should:](#)

1. Fully exercise delegated federal authority, especially under the Clean Air Act and Clean Water Act, to restrict or deny permits for proposed projects.
2. **Fill the “regulatory vacuum”** created by the Trump Administration with a robust set of strategies to implement the state’s 2017 Methane Reduction Plan and limit air pollution from oil and gas operations.
3. Enforce specialized permit conditions for pipeline infrastructure.

[In 2014, the Cuomo Administration prohibited shale gas production in New York based on risks to health and the environment. Today, it should give equal weight to the fact that the proposed gas infrastructure buildout runs counter to the state’s climate goals and positions. New York agencies have the authority to prevent the state from getting locked into yet another fossil fuel source for decades to come. For the sake of residents and the climate, the time has come for New York to rapidly and fully commit to a clean energy future.](#)



New Yorkers rally in Albany against the Constitution Pipeline. Photo by Erik McGregor.

1 — Introduction

For many years, natural gas has been marketed as a viable energy source for states and nations wishing to reduce air pollution. The fact that gas burns cleaner than coal and oil (i.e., emits less carbon and particulates per unit of energy) *at the point of end use*—a power plant, home heating system, or kitchen appliance—convinced many legislators and consumers to opt for gas.

Yet by the late mid-2000s, as the shale gas production boom spread across the United States, reality began to shape a different narrative. With more US residents living near wells and facilities, degradation of water, air, and health have become far more widespread and widely publicized. The voices of affected communities and concerned activists have grown steadily louder. The scientific community has followed with research examining the impacts of oil and gas development on water, air, health, and the climate.

By the end of 2015, more than 80% of the peer-reviewed research on shale and tight gas development was fewer than three years old, and the vast majority of this research identified significant environmental and health hazards.² In addition, studies examining greenhouse gas (GHG) emissions from the entire lifecycle of gas development and use demonstrated the negative implications for the climate, due in large part to the leakage of methane across the natural gas system.³ Perhaps most importantly, a growing number of reports from communities living with oil and gas operations indicated increasingly clear patterns of negative impacts on health, quality of life, and property.

Based on this rapidly growing body of research and evidence, Governor Cuomo's Administration decided at the end of 2014 to prohibit shale gas production because of risks to health and the environment.⁴ This historic turning point followed an intense, seven-year social, legal, and political fight, during which impacts to water and air quality were front and center.

Today, New York continues to wrestle with the role of natural gas in the state's energy future—but this time with a focus on the use of fossil fuels in the age of climate change. More specifically, many residents and advocates wonder whether the state can reduce GHG emissions while also expanding pipeline capacity. New York said “no” to gas production, yet continues to say “yes” to transporting and delivering it for use in homes and businesses within the state, as well as to New England and Canada.

The overarching conclusion of this analysis is that bringing the proposed additional pipelines and related infrastructure online and utilizing this infrastructure at average rates will make it virtually impossible for New York to reach its climate goals.



The following pages examine this tension in the context of air pollution, policies, and regulations related to natural gas infrastructure. Earthworks commissioned a comprehensive analysis by Physicians, Scientists, and Engineers for Healthy Energy (PSE) that considers the ability of New York to reach its GHG reduction goals in light of the natural gas pipeline and compressor station projects currently in planning, use, or development statewide. The overarching conclusion of this analysis is that bringing the proposed additional pipelines and related infrastructure online and utilizing this infrastructure at average rates will make it virtually impossible for New York to reach its climate goals.

At the same time, New York has a number of policy and regulatory options available to reduce air emissions and impacts on the climate, health, and communities—some of which the state has already pledged to implement. We examine some of these options with an eye toward the choices Governor Cuomo and New York agencies can make when deciding whether or not to move forward with a natural gas project.



Emissions seen with optical gas imaging, Hancock Compressor Station, Sullivan County, New York. Images by Earthworks.

2—The Challenge of Natural Gas

New York has positioned itself as a leader on efforts to slow climate change and accelerate the use of clean energy. At the same time, the state contemplates or actively supports various fossil fuel projects, including natural gas pipelines, compressor stations, and gas-fired power plants—all while gas consumption in the state continues to grow.

Gas transportation and delivery infrastructure causes air pollution at various stages of operation through combustion, venting, and leakage, as well as accidental events such as explosions and equipment failure. In addition, in production areas that feed Northeast markets, drilling, hydraulic fracturing, removal of gas liquids, use of engines and trucks, and other processes generate emissions. Industry predicates the continued pursuit of gas production in part on the ability to transport gas via pipelines to high-population, gas-dependent destinations like New York, New England, as well as internationally.⁵

From a climate change perspective, a significant concern with natural gas development is growing methane emissions. Methane is approximately 87 times more potent a GHG than CO₂ when calculated over a 20-year timescale, and 36 times more potent over a 100-year timescale.⁶ In addition, volatile **organic compound (VOC) emissions “hitchhike” along with methane during gas production and transportation**, worsening air quality and contributing to health impacts such as respiratory and cardiovascular problems, headaches, and neurological changes.⁷

Like the rest of the United States, New York’s consumption of natural gas has risen. From 2010-2016, total gas consumption in the state grew nearly 9% per capita and gas use for electricity grew more than 10% per capita, while the total volume of gas distributed through pipelines and distribution lines nearly doubled.⁸

With New York’s own oil and gas production waning, other states produce increasing amounts of gas used by New Yorkers. In the last ten years (2007-2016), the net volume of natural gas received by New York from Pennsylvania—the center of the Marcellus Shale gas boom—grew nearly 700%, compared to nearly a 50% decline in net volume received in the preceding decade (1997-2006).⁹ Some of that gas merely passed through New York toward destinations elsewhere. In fact, New York plays a growing role as a gas **“thoroughfare,” with deliveries from the state to neighboring Massachusetts**

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New York plays a growing role as a gas **“thoroughfare,” with deliveries from the state to neighboring Massachusetts growing nearly 10% and to Canada more than 300% in the last five years (2012-2016).**



growing nearly 10% and to Canada more than 300% in the last five years (2012-2016).¹⁰

In the middle of this expanding pipeline infrastructure network and related pollution stands **New York's 2015 Energy Plan**. The Plan sets ambitious goals for 2030: a 40% reduction in GHG emissions from 1990 levels; 50% of electricity generated from renewable energy sources; and a 23% decrease in energy consumption in buildings from 2012 levels. Looking even further ahead, New York aims to reduce GHG emissions 80% by 2050.¹¹



40% Reduction in GHG emissions from 1990 levels

Reducing greenhouse gas (GHG) emissions from the energy sector—power generation, industry, buildings, and transportation—is critical to protecting the health and welfare of New Yorkers and reaching the longer term goal of decreasing total carbon emissions 80% by 2050.

50% Generation of electricity must come from renewable energy sources

Renewable energy sources, including solar, wind, hydropower, and biomass, will play a vital role in reducing electricity price volatility and curbing carbon emissions.

23% Decrease in energy consumption in buildings from 2012 levels

Energy efficiency results in lower energy bills and is the single most cost-effective tool in achieving energy objectives. 600 trillion British thermal units (Tbtu) in energy efficiency gains equates to 23% reduction in energy consumption by buildings.

These specific benchmarks belong to Governor Cuomo's overarching strategy called Reforming the Energy Vision (REV), which aims to develop and deliver a "clean, more resilient, and affordable" energy system through a combination of regulatory reform, economic investments, and energy efficiency.¹² In addition, New York's 2017 Methane Reduction Plan lays out necessary improvements in pollution controls for oil and gas infrastructure, landfills, and agriculture.¹³

According to the New York State Energy Research and Development Authority (NYSERDA), the state's energy-related carbon dioxide equivalent (CO₂e)¹⁴ emissions declined by 13% between 1990 and 2014, or less than 1% per year.¹⁵ Such limited progress on GHG emission reductions is in large part the result of increased reliance on natural gas, even as the state has slashed the use of coal and oil.¹⁶ As of 2015, petroleum accounted for 54% of CO₂ emissions in the energy sector, but natural gas generated 44% (coal dwindled to just 2%).¹⁷ When it comes to home heating, electricity, and other energy demands, New York has been switching sources, but remains strongly tied to fossil fuels.



3 — The New York Natural Gas Pipeline Buildout

With their stated preference for a clean energy future, New York’s policymakers and environmental regulators have significant choices to make. As detailed in Section 4, the state is not the sole actor in making these decisions, but interacts with a complex set of federal laws. Even so, Governor Cuomo and the New York Department of Environmental Conservation (DEC) have considerable authority to determine whether, and under what conditions, to permit the expansion of pipelines, compressor stations, and other natural gas infrastructure.

Within this context, Earthworks commissioned *Physicians, Scientists, and Engineers for Healthy Energy* (PSE) to conduct a comprehensive analysis to answer the question, “If proposed natural gas pipelines are built and used at current average rates, can New York achieve its greenhouse gas reduction targets?” As detailed in the following pages, the essential conclusion of this analysis is a resounding no.

Governor Cuomo and the New York Department of Environmental Conservation (DEC) have considerable authority to determine whether, and under what conditions, to permit the expansion of pipelines, compressor stations, and other natural gas infrastructure.

PSE’s analysis and conclusions are summarized in the following pages; the complete research report, including detailed methodology and additional data tables, is available at earthworksaction.org/nyenergyxroads.

Approach

The PSE analysis investigates the lifecycle greenhouse gas emissions associated with the build-out of ten pipelines proposed for construction across or delivery to New York State, nine compressor stations (both new and upgrades) and five meter and regulator (M&R) stations associated with those pipelines. (See the Map and Tables 1, 2, and 3 below for details on these pipelines and stations.)

PSE’s analysis did not estimate natural gas demand in New York State, but instead the growth in gas use, and in turn GHG emissions, that could result from the proposed facilities. PSE bases its estimates on the assumption that new pipelines would be used at rates similar to current ones, or an average rate of 53% capacity.

PSE’s analysis started with developing a list of proposed and permitted pipelines crossing New York, based on state and federal databases from the Federal Energy Regulatory Commission (FERC), the Energy Information Administration (EIA), and New York’s Department of



Environmental Conservation (DEC). Records from pipeline operators and FERC reveal the pipeline end location, geographic service area of firm contracts, and locations of tie-ins with existing pipeline networks. DEC and FERC permits provide information on the compressor and M&R stations necessary to calculate potential emissions, including model, equipment, horsepower, and established emission factors (which are calculated according to engineering specifications for the rate at which a source emits pollutants and the time it operates).

The map below shows the pipelines and associated compressor and M&R stations that PSE considered. They are at various stages of development, with some in planning, others in the process of permit review, and some already under construction. Four of the pipelines currently have firm contracts to deliver gas for residential, commercial, and industrial use in New York, while three are on hold because of a mix of legal and policy questions.

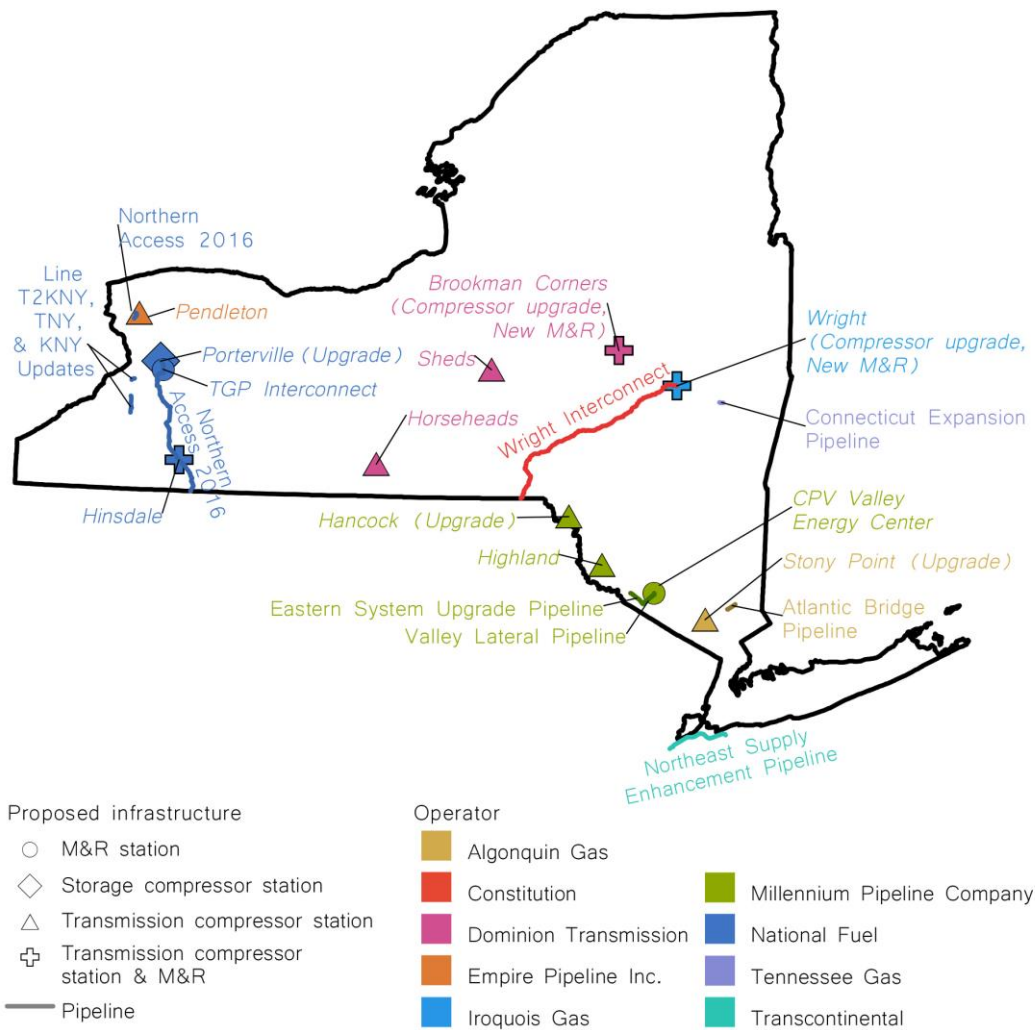


Figure 1. Pipelines and associated compressor and M&R stations that Physicians, Scientists, and Engineers for Healthy Energy considered.



As seen in Table 1, six of the pipelines are expected to deliver all the gas they transport within New York, including four intrastate and two interstate pipelines. Two other pipelines would transport all their gas through New York for delivery in New England and Canada; and two more would provide gas for use both in and outside New York. Given this variation, PSE bases emissions calculations in part on the estimated “flow fraction” to be delivered within New York State, or the proportion of natural gas carried by a pipeline that is delivered to New York, with the remaining proportion slated for delivery out-of-state (i.e., 0%, 25%, 50%, 75%, 100%).¹⁸

| Proposed pipeline projects completely or partially sited in New York State as of mid-2017. | | | | | | | |
|--|------------------|--------------------|---------------------------|---|---------------------------------------|---|--|
| Company/project | Status | FERC docket no. | Net new capacity (MMcf/d) | Pipeline start point | Pipeline end point | Estimated flow fraction delivered in NY | Implied NY natural gas consumption (MMcf/year) |
| Dominion New Market Project | Mid-construction | CP14-497 | 112 | Clinton County, PA | Montgomery & Schenectady Counties, NY | 100% | 21,666 |
| National Fuel Line T2KNY, TNY, and KNY Updates | Mid-construction | CP16-125 | 3 | Erie County, NY | Erie County, NY | 100% | 503 |
| Tennessee Gas Connecticut Expansion Project | Mid-construction | CP14-529 | 72 | Albany County, NY | Hartford County, NY | 0% | 0 |
| Transcontinental Gas NY Bay Expansion Project | Mid-construction | CP15-527 | 115 | York County, PA | NY State waters & Richmond County, NY | 100% | 22,247 |
| Constitution & Iroquois Gas Wright Interconnect Project | On hold | CP13-499; CP13-502 | 650 | Susquehanna County, PA | Schoharie County, NY | 75% | 94,307 |
| Millennium Valley Lateral Project | On hold | CP16-17 | 130 | Orange County, NY | Orange County, NY | 100% | 25,149 |
| National Fuel & Empire Pipeline Inc. Northern Access 2016 Project | On hold | CP15-115 | 497 | McKean County, PA | Niagara & Erie Counties, NY | 25% | 24,036 |
| Algonquin Gas Atlantic Bridge Project | Planning stages | CP16-9 | 239 | Bergen County, NJ & Rockland County, NY | MA, ME & US-CA border | 0% | 0 |
| Millennium Eastern System Upgrade | Planning stages | CP16-486 | 223 | Steuben County, NY | Rockland County, NY | 100% | 43,139 |
| Transcontinental Gas Northeast Supply Enhancement | Planning stages | CP17-101 | 400 | York County, PA | Offshore Rockaway Transfer Point, NY | 100% | 77,380 |

Table 1. Pipeline projects proposed in New York.



Estimated annual methane emissions per proposed New York compressor station.

| Compressor station name | Station type | Proposal type | Affiliated proposed pipeline | NY DEC Permit No. | Town | Estimated methane emissions (metric ton/year) |
|-------------------------|--------------|---------------|---|--------------------|-------------|---|
| Brookman Corners | Transmission | Upgrade | Dominion New Market Project | 4-2730-00038/00001 | Minden | 388 |
| Hancock | Transmission | Upgrade | Millennium Eastern System Upgrade | 4-1236-00708/00001 | Hancock | 111 |
| Highland | Transmission | New build | Millennium Eastern System Upgrade | 3-4834-00147/00001 | Eldred | 392 |
| Horseheads | Transmission | New build | Dominion New Market Project | 8-0740-00081/00001 | Veteran | 512 |
| Pendleton | Transmission | New build | National Fuel & Empire Pipeline Inc. Northern Access 2016 Project | 9-2932-00111/00001 | Pendleton | 433 |
| Porterville | Storage | Upgrade | National Fuel & Empire Pipeline Inc. Northern Access 2016 Project | 9-1442-00039/00015 | Elma | 380 |
| Sheds | Transmission | New build | Dominion New Market Project | 7-2530-00033/00001 | Georgetown | 389 |
| Stony Point | Transmission | Upgrade | Algonquin Gas Atlantic Bridge Project | 3-3928-00001/00027 | Stony Point | 106 |
| Wright | Transmission | New build | Constitution & Iroquois Gas Wright Interconnect Project | 4-4350-00008/00012 | Wright | 431 |

Table 2. Estimated methane emissions from compressor stations.



Dunbar Compressor Station, Broome County, New York. Photo by Earthworks.

Estimated methane emissions per proposed New York meter and regulator station.

| M&R station name | Type | Affiliated proposed pipeline | Handover company | Town | Estimated methane emissions (metric tons/year) |
|---------------------------------|--------------------------|---|--|-----------|--|
| Brookman Corners | Trans. co. interconnect | Dominion New Market Project | Iroquois Gas Transmission (IGT) | Minden | 28.0 |
| Westfall Road | Trans. co. interconnect | Constitution & Iroquois Gas Wright Interconnect Project | n/a, receiving gas from Constitution Pipeline Company, LLC | Wright | 28.0 |
| TGP Interconnect | Trans. co. interconnect | National Fuel & Empire Pipeline Northern Access 2016 | Tennessee Gas (TGP 200 Line) | Wales | 28.0 |
| Hinsdale | Trans. co. interconnect | National Fuel & Empire Pipeline Northern Access 2016 | National Fuel (Line X-South) | Hinsdale | 28.0 |
| CPV Valley Energy Center | Farm taps & direct sales | Millennium Valley Lateral Project | CPV Valley Energy Center | Wawayanda | 0.2 |

Table 3. Estimated methane emissions from meter and regulator stations.



Meter and regulator station, Orange County, New York. Photo by Earthworks.

PSE's calculations take into account two types of emissions:

- 1) Methane and carbon dioxide emissions within New York State from the proposed natural gas infrastructure itself.
- 2) Lifecycle greenhouse gas emissions from the potential increase in natural gas delivered for use in New York State. This includes in-state carbon dioxide emissions from combustion, upstream carbon dioxide emissions (primarily from fossil fuel production and processing), and methane leakage across the natural gas lifecycle.

The analysis examines emissions from natural gas infrastructure within New York, as well as **“upstream” locations outside the state that supply it with gas**. PSE did not include in the lifecycle emissions calculations the two pipelines that would provide natural gas entirely outside of New York (the Connecticut Expansion Project and Atlantic Bridge Project), but did separately estimate the within-New York GHG emissions associated with those projects.

Lifecycle GHG emissions calculations are especially appropriate in New York, where gas consumption and distribution taking place in-state, is inextricably linked to production in other states. Counting upstream emissions is an established approach. NYSERDA also includes in its estimates of GHG emissions the pollution from electricity produced in other states but imported to New York.¹⁹ In addition, the US Council on Environmental Quality (CEQ) supported this approach in its (now rescinded) GHG Guidance for federal agencies conducting environmental reviews (GHG Guidance).²⁰

Lifecycle emissions estimates account for both **“normal operations” and leakage, or gas** emitted from poorly functioning equipment such as valves, seals, and tank lids. Leakage rate estimates vary widely across wells, facilities, and geographies. The 2017 US Environmental Protection Agency (EPA) Greenhouse Gas Inventory estimates a low rate of 1.4% of dry gas production.²¹ At the same time, studies focusing on atmospheric field measurements indicate leakage rates as high as 19% for some specific operations.²²

PSE examined state and federal permit applications to identify the equipment operators planned to use in the different infrastructure projects. PSE then used established emissions factors (i.e., an estimated rate of emissions based on engineering specifications) to calculate direct carbon dioxide and fugitive methane emissions. Such an approach is often called the **“bottom up” approach to calculating emissions, which relies on estimates for equipment and processes**.

PSE also considered emissions estimates for compressor station **“super emitters”**—facilities that emit a disproportionately large volume of pollutants—to help bridge the gap between the bottom-up and other **“top-down” studies**. The top-down approach relies on actual measurements of pollutants in the air and models their path to determine the source; such research typically finds higher leakage rates by measuring atmospheric concentrations of pollutants than indicated by estimates used in bottom-up studies.²³ **As a result, PSE's lifecycle**



emissions analysis was comprehensive, comprising estimates from equipment components, actual field measurements, and modeling.

PSE's analysis considered different scenarios for New York's GHG emissions based on leakage estimates for pipelines that are low (1.4%, or the rate used in the EPA's Greenhouse Gas Inventory); medium (2.5%, based on two leading studies);²⁴ and high (4%, based on the typical upper range considered in other leading studies).²⁵ While upstream methane leakage rates are uncertain, this range reasonably reflects the potential amount of leakage for GHG estimates. For the compressor stations, PSE relied on emissions factors for different equipment types (e.g., pneumatic devices and exhaust) and super-emitter estimates from a leading study.²⁶ For the M&R stations, PSE relied on emissions factors from the EPA Greenhouse Gas Inventory.²⁷



Emissions venting seen with optical gas imaging. Bluestone Gas Processing Plant, Butler County, Pennsylvania. Images by Earthworks.

Key Findings

PSE’s overarching conclusion is that New York cannot permit and use all of the proposed pipelines and associated infrastructure without severely undermining the state’s GHG reduction efforts. Full buildout and average utilization of the proposed infrastructure would cause New York’s consumption of natural gas to jump 23% above 2015 levels, or a growth of 308,000 million cubic feet (MMcf) of gas per year.

This increase presumes that current utilization and flow rates continue for existing pipelines and apply to new pipelines. Resulting emissions estimates could be higher or lower if demand and delivery destinations change over time. For example, if the pipelines currently proposed for mixed delivery in New York and New England/Canada instead deliver all the gas to New England/Canada, gas consumption in New York would increase 14%. However, if all the gas from these mixed delivery pipelines were delivered only to New York, the state’s gas consumption would grow 30%.

Full buildout and average utilization of the proposed infrastructure would cause New York’s consumption of natural gas to jump 23% above 2015 levels.

This represents a 12% increase in New York’s energy-related GHG emissions.

Assuming a medium leakage rate (2.5%), additional GHG emissions would increase by over 31 million metric tons CO₂e in the next 20 years. This represents a 12% increase in New York’s energy-related GHG emissions. Nearly all of the increase in emissions in New York would be the result of higher gas use in the state, not from the state’s role as a “thoroughfare” transporting gas for use in New England and Canada. (See Figure 1 below for GHG estimates from New York gas use according to timescale.)

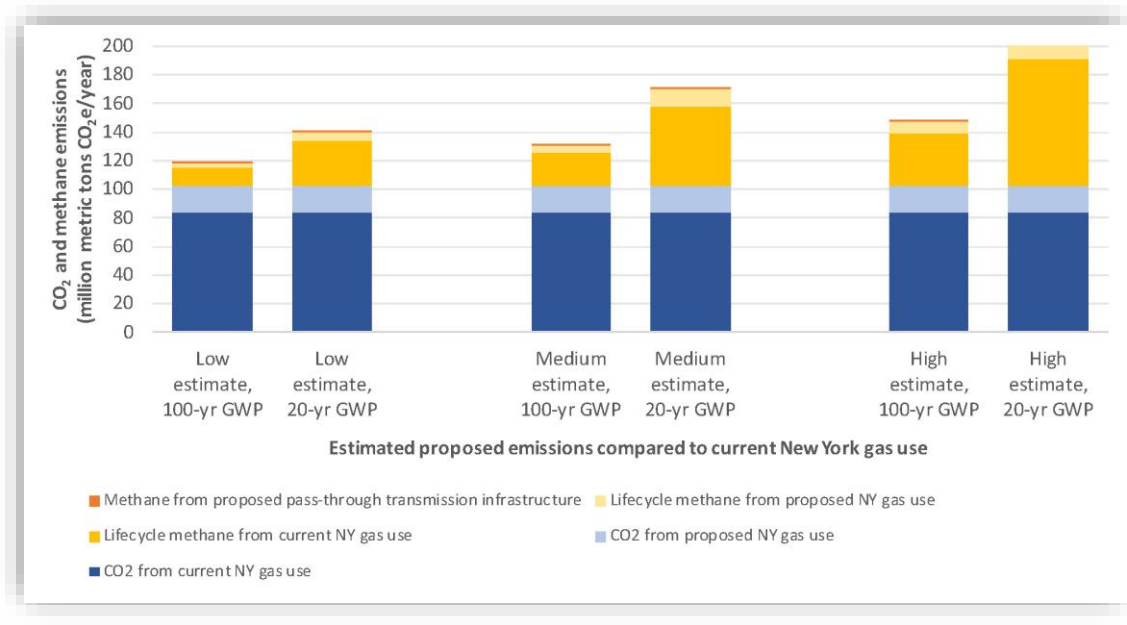


Figure 1. Estimated proposed emissions compared to current New York gas use.

Specific implications of the increased gas consumption and greenhouse gas emissions include:

- 16.9 million metric tons per year of in-state combustion-related CO₂ emissions, or a 23% increase of natural gas-related CO₂ emissions and a 10% increase in total in-state energy-related CO₂ emissions. Just two of the pipelines (the Constitution & Iroquois Gas Wright Interconnect Project and the Transcontinental Gas Northeast Supply Enhancement) account for more than half (56%) of the estimated increase in CO₂ emissions.
- Proposed transmission compressor stations would generate the largest proportion (nearly 82%) of the additional direct methane emissions from proposed infrastructure. This is, followed by storage compressor stations (about 11%), pipelines (about 4%), and M&R stations (about 3%).
- Almost half (46%) of the additional lifecycle CO₂e emissions from pipelines would come from projects currently on hold, followed by those currently in planning stages (39%), and lastly those that are currently mid-construction (14%).
- Almost half (43%) of the additional lifecycle CO₂e emissions from transmission and storage compressor stations would come from projects currently on hold, followed by projects currently under construction (39%), and projects in their planning stages (19%).
- Nearly 133 metric tons per year of methane emissions would result from fugitive pipeline leaks and pipeline venting due to routine maintenance or upsets, or an increase in methane of 4.8% compared to estimates for current pipelines. Because these estimates are based on pipeline length, 81% of this estimated increase comes from the two longest proposed pipelines (the Constitution & Iroquois Gas Wright Interconnect Project and the National Fuel & Empire Pipeline Inc. Northern Access 2016 Project).



Pipeline construction, Washington County, Pennsylvania. Photo by Earthworks.

Estimated lifecycle methane and carbon dioxide emissions resulting from presumed consumption of natural gas delivered to New York via proposed pipelines, inclusive of upstream CO₂ emissions and low, medium, and high methane leakage rates. Values reflect low (1.4%), mid (2.5%) and high (4%) fugitive methane leakage rates, using a global warming potential (GWP) of 87 over a 20-year period and 36 over a 100-year period. Tennessee Gas Connecticut Expansion Project and Algonquin Gas Atlantic Bridge Project excluded due to expected delivery outside of New York State.

| Proposed project | CO ₂ emissions | | Methane emissions | | | Methane and CO ₂ emissions (20-year GWP) | | | Methane and CO ₂ emissions (100-year GWP) | | |
|--|---|-------------|--------------------------|----------------|----------------|---|--------------|--------------|--|--------------|--------------|
| | Direct | Upstream | | | | | | | | | |
| | million metric tons CO ₂ /year | | metric tons methane/year | | | million metric tons CO ₂ e/year | | | million metric tons CO ₂ e/year | | |
| Methane leakage rate | | | low | medium | high | low | medium | high | low | medium | high |
| Constitution & Iroquois Gas Wright Interconnect Project | 5.16 | 0.69 | 23,640 | 42,210 | 67,540 | 7.91 | 9.52 | 11.72 | 6.70 | 7.34 | 8.28 |
| Dominion New Market Project | 1.19 | 0.16 | 5,430 | 9,700 | 15,520 | 1.82 | 2.19 | 2.69 | 1.54 | 1.69 | 1.90 |
| Millennium Eastern System Upgrade | 2.36 | 0.31 | 10,810 | 19,310 | 30,900 | 3.62 | 4.36 | 5.36 | 3.06 | 3.37 | 3.79 |
| Millennium Valley Lateral Project | 1.38 | 0.18 | 5,880 | 10,500 | 16,800 | 2.07 | 2.47 | 3.02 | 1.77 | 1.94 | 2.16 |
| National Fuel & Empire Pipeline Northern Access 2016 | 1.32 | 0.17 | 6,030 | 10,760 | 17,210 | 2.01 | 2.43 | 2.99 | 1.71 | 1.88 | 2.11 |
| National Fuel Line T2KNY, TNY, and KNY Updates | 0.03 | 0.004 | 130 | 230 | 360 | 0.042 | 0.051 | 0.063 | 0.036 | 0.039 | 0.044 |
| Transcontinental Gas NY Bay Expansion Project | 1.22 | 0.16 | 5,580 | 9,960 | 15,930 | 1.86 | 2.25 | 2.77 | 1.58 | 1.74 | 1.95 |
| Transcontinental Gas Northeast Supply Enhancement | 4.24 | 0.56 | 19,400 | 34,640 | 55,420 | 6.49 | 7.81 | 9.62 | 5.50 | 6.05 | 6.79 |
| New York total | 16.89 | 2.24 | 78,890 | 137,300 | 219,680 | 25.82 | 31.07 | 38.24 | 21.90 | 24.07 | 27.04 |

Table 4. Estimated lifecycle emissions from presumed consumption of natural gas delivery.



Spectra Energy prepares to lay pipe under the Hudson River for the Algonquin Incremental Market project. Photo by Erik McGregor/Pacific Press.



New York's Options

PSE has analyzed six potential 2030 scenarios, including four for reducing energy-related GHG emissions 40% from 1990 levels (or roughly 28% lower than 2015 levels). As illustrated in Figure 2 below, the potential scenarios for New York include:

- 25% cuts below 1990 levels from both petroleum (oil) and natural gas and the elimination of coal.
- Drastically cutting oil use and eliminating coal, yet keeping gas emissions flat.
- Proportional emission reductions from each energy use sector (residential, transportation, commercial, and industrial), but favoring reductions in oil and coal before gas within each sector.
- Building all the proposed pipelines and drastically cutting oil use plus eliminating coal.
- Building all the proposed pipelines and flat oil and coal use (2030 target exceeded).
- Building all the proposed pipelines, cutting oil 25% below 2015 levels, plus eliminating coal (2030 target exceeded).

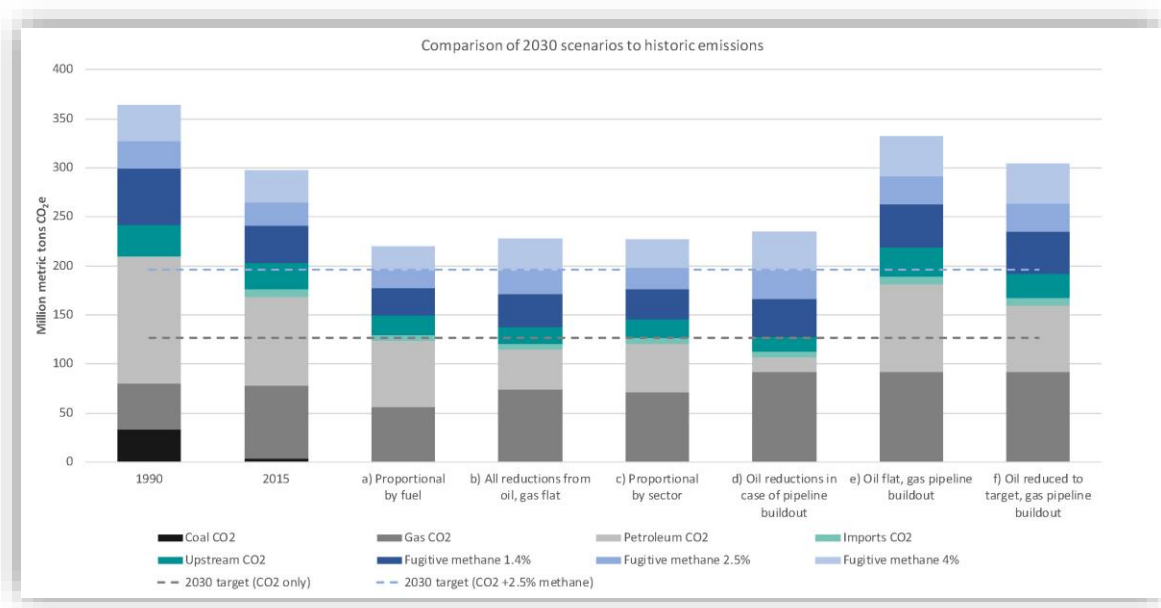


Figure 2. Comparison of 2030 scenarios to historic emissions.

Only [scenarios a and c](#)—reducing both oil and natural gas consumption and emissions in all energy use sectors—**provide feasible options to achieve the state’s 2030 greenhouse gas reduction targets.**

- Under [scenario b](#), in which gas consumption is flat, New York will need to reduce oil use 55% below 2015 levels plus eliminate coal.
- Under [scenario d](#), full pipeline buildout and utilization would require New York to reduce oil consumption 67% below 2015 levels when considering only direct CO₂—and by 83% below 2015 levels assuming a medium methane leakage rate (2.5%).
- Under [scenario e](#), oil and coal use consumption would have to stay flat, but the **pipeline buildout would increase New York’s energy-related greenhouse gas emissions by 11%, 12% or 13% compared to 2015 under low, medium and high methane leakage rates, respectively.**
- Finally, under [scenario f](#), even if New York successfully reduced petroleum use by a quarter, the switch to natural gas use from the pipeline buildout would nearly offset that cut. Assuming a low methane leakage, scenario f results in barely a 3% overall GHG reduction by 2030; assuming high methane leakage, scenario f actually results in an overall GHG emissions increase. In the case of a high methane leakage rate (4%), New York would need to nearly eliminate petroleum (oil) use—a decline of 97%—by 2030 in order to meet its GHG targets.

Any scenario requiring drastic cuts in oil in just over a decade seems quite unlikely. This is **because the transportation sector now accounts for 80% (and growing) of New York’s oil consumption.** As a practical matter, meeting this GHG reduction goal means keeping most cars and trucks off the road. New Yorkers would need to rapidly switch private and public fleets to electric vehicles powered by renewable energy.

In sum, the only realistic option for New York to achieve its 2030 GHG reduction targets is to cut use of both oil and natural gas. Since building and using pipelines increases gas use, New York cannot realistically build and use more pipelines and achieve its goals.

4 — New York’s Authority and Opportunities

As detailed above, New York cannot both reach its established GHG reduction goals while pursuing more pipelines and gas infrastructure. Achieving climate goals will require reducing fossil fuel use—not continuing to go down a path that would lock the state into even more gas consumption.

Outright rejection of the proposed natural gas buildout would certainly be consistent with **New York’s previous decision not to allow shale gas production within state borders**. Yet there are two key differences between the current debate and the past “fracking fight” that make halting the proposed gas infrastructure build out even more complex.

First, while state agencies have most permitting and regulatory authority over oil and gas drilling and production, they have less authority over pipelines and related transportation and delivery infrastructure. Second, New Yorkers highly depend on natural gas from other states and the pipeline infrastructure to meet consumer demand.

Nevertheless, New York has on occasion exercised state authority to stop or slow the pipeline buildout—but room for improvement certainly remains. The following pages outline legal, statutory, and regulatory opportunities for New York to prevent emissions from gas infrastructure and, in doing so, get on a steadier path toward reaching its climate goals.

A. Federal Laws

The “SuperFERC” Factor

Most policy decisions affecting interstate oil and gas pipelines belong to their primary regulator, the Federal Energy Regulatory Commission (FERC). The Natural Gas Act provides **FERC’s statutory authority to oversee almost all aspects of interstate pipelines and their infrastructure.**²⁸ This includes granting a pipeline operator the power to seize private property through eminent domain.

When an operator seeks to build an interstate pipeline, FERC must first issue a “Certificate of Public Convenience and Necessity” (CPCN). When FERC grants a CPCN, interested parties may petition for a rehearing, or an opportunity to object. Usually, FERC responds to these rehearing petitions with a “tolling order.” **The order only “tolls,” or pauses, the petition, but has no effect upon the CPCN or any aspect of permitting, construction, or operation.**

In practice, tolling orders indefinitely stall community opposition while FERC and the operator continue the approval process. This approval process can involve consultation with and



approval from state agencies. For instance, when a pipeline path crosses a New York stream, the permit applicant must receive a **Clean Water Act permit from the state's** Department of Environmental Conservation (DEC). Deferring to states allows FERC to rely on agencies with specialized environmental expertise, local knowledge, and familiarity with the water resources involved.

In New York, the state's relationship with FERC has led to a clash of regulators. At the time of this writing, pending litigation and **shifting policy initiatives have yet to resolve who's in charge.** In cases involving both the Constitution Pipeline and the Millennium Valley Lateral Pipeline, a seemingly narrow legal question over whether the state raised its objections in a timely manner has pitted Governor Andrew Cuomo against the Trump Administration.

In New York, the **state's relationship** with FERC has led to a clash of regulators. At the time of this writing, pending litigation and shifting policy initiatives have **yet to resolve who's in charge.**

It is possible FERC may seek to resolve or mitigate this conflict. In December 2017, the agency announced an effort to reform the CPCN and permitting process.²⁹ Some initial indications suggest that greater deference to state decisions is on the horizon—**FERC's abrupt reversal on the Constitution pipeline** (discussed below) as an example. FERC has a long way to go toward pipeline permitting reform. They can begin by denying pipelines. Between fiscal years 2009-2016, FERC received 1,068 applications for natural gas infrastructure, FERC denied only two.³⁰

The 115th Congress appears all too eager to weigh in as well. A handful of legislative proposals now under consideration attempt to wrest away state power to reduce GHG emissions from pipelines.³¹ These bills tend to include a mix of the following elements: permit timelines, easing eminent domain, and deference to a **"SuperFERC" in the event of a conflict** with a state.

Clean Water Act

The Environmental Protection Agency (EPA) has delegated authority to New York to issue permits under federal environmental laws, including under the Clean Water Act and Clean Air Act.³²

So far, New York's greatest exercise of state power to prevent the construction, expansion, and permitting of additional pipelines stems from its Clean Water Act authority. Operators seek from DEC a number of Clean Water Act permits to manage stormwater, sediment, and erosion. **Yet, DEC has most asserted itself in high profile decisions denying Clean Water Act's Section 401 permits, the certification needed for pipelines to cross streams and wetlands.**³³

In three high profile cases involving three pipelines **included in PSE's analysis, the state of New York** has, as of the time of this writing, refused to issue its Section 401 certification for certain



pipelines crossings over streams and wetlands—effectively stalling portions of the project. This has tipped off furious debates in courtrooms, policy-making circles, and among activists and industry. This debate has even, at times, pitted the President’s FERC against the Governor’s DEC. New York, for its part, refuses to cede authority to protect its own water resources.

1) Constitution Pipeline

The Constitution Pipeline (Constitution) case created a major stand off between a pipeline company and New York’s DEC. Constitution’s operator proposed to construct an interstate natural gas pipeline that will travel 126 miles from northeastern Pennsylvania through New York.

FERC granted a CPCN to the pipeline company only to see DEC step in to protect the state’s interest in the more than 250 streams that the project would impact. In early 2016, DEC denied Constitution’s application for a Clean Water Act Section 401 water quality certification permit because the company had not complied with the state’s information requests.

The clash between Constitution and DEC fomented before the 2nd U.S. Circuit Court of Appeals, which sided with New York in August 2017.³⁴ Since then, lobbyists for Constitution have continued to pressure the Trump Administration and FERC to overrule New York. So far, the company has failed. In January 2018, FERC announced that it refused Constitution’s request to waive DEC’s permit denial, leading the pipeline company to ask the US Supreme Court to resolve the dispute. In the meantime, it is unlikely the pipeline will become operational before 2019.³⁵

This pipeline, coupled with the Iroquois Gas Wright Interconnect Project, accounts for 30% of the lifecycle GHG emissions from the proposed pipeline buildout, according to the PSE analysis (see Table 1 above). With such a large chunk of potential GHG emissions dependent upon such a modest number of sources, DEC should look closely at “low hanging fruit” projects like Constitution when looking for ways to meet state climate goals.

2) Millennium Valley Lateral Pipeline

The same Court hearing the Constitution case will make a very similar decision on the Millennium Valley Lateral Pipeline (Millennium). On December 7, 2017, the Court ruled that construction may temporarily proceed while it sorts out the case’s merits. This project connects Millennium Pipeline Company LLC’s main line to a power plant in Orange County, NY. As with Constitution, the Court will decide whether New York raised their objections to the Valley Lateral in a timely manner.

In August 2017, DEC denied the Clean Water Act Section 401 permit precisely because FERC failed to properly consider GHG emissions in their environmental assessment. But the following month FERC overruled the state, waiving its denial by saying it took too long. That action prompted New York to sue.³⁶

3) Northern Access

DEC also refused a Clean Water Act Section 401 permit for the Northern Access pipeline in April 2017. The operator, National Fuel Gas Company, proposes a pipeline to stretch nearly 100 miles through Western New York, potentially impacting 192 streams and 17 acres of wetlands.³⁷ The project would also include a new



compressor station and dehydration facility in Niagara County. National Fuel, has challenged DEC's permit denial in the US Court of Appeals for the 2nd Circuit, where oral arguments occurred in November 2017.

For each of these pipelines, FERC had already granted permission to National Fuel, only to have New York's DEC deny the water quality certification based on the significant risks to streams and wetlands. The outcomes of the Constitution, Millennium Valley Lateral, and Northern Access cases could help determine the balance of power between the states and federal government over interstate pipelines.

Clean Air Act

In the meantime, nothing prevents New York from filling in the regulatory air space left vacant by the shift to a climate-denying federal Administration. As noted above, many of the basic federal laws that have formed bedrock environmental safeguards since the inception of the environmental movement allow the states to carry out their own regulatory programs.

The tangle between FERC and DEC over the Clean Water Act may have ripple effects on **whether and how DEC's exercises its other delegated powers, particularly under the Clean Air Act.** The Court results from the Constitution, Millennium Valley Lateral, Northern Access, and other pipeline cases, may settle a key question: **who's in charge?**

While the courts wrestle with which regulator wins, the PSE analysis of New York's gas infrastructure buildout signals the especially high contribution that new compressor stations along proposed pipelines would make to New York's GHG emissions. All pipelines through New York, regardless of the market where the gas ends up, will need compressor stations and related infrastructure to keep the gas moving along the pipeline's path.

The Clean Air Act provides some tools for New York to regulate GHG emissions from these facilities. Under its delegated authority, DEC has the discretion to set more restrictive **standards to prevent "emissions of air contaminants to the outdoor atmosphere...which are injurious to human, plant or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life or property."**³⁸

For instance, in 2016 the Environmental Protection Agency (EPA) finalized a Clean Air Act Section 111(b) New Source Performance Standard specifically focusing on methane emissions from the oil and natural gas sector (known as the EPA methane rule).³⁹ **While EPA's methane rule focuses on emissions from oil and gas production, which is limited in New York, the rule also covers compressor stations and other facilities along pipelines.** At the time of writing, the federal government is set to finalize an expected stay of the rule, and later seek to overturn it entirely. That decision will likely result in litigation from citizen and conservation organizations to maintain the methane rule and the emissions controls it entails.

New York's 2017 methane reduction plan supports a statewide rule to complement this EPA regulation. To best serve that purpose, New York's methane rule should concentrate on methane emissions from pipelines, compressor stations, pigging stations, and other natural gas infrastructure. New Yorkers will benefit from fewer leaks in the form of lower GHG



emissions, improved health outcomes due to the reduction of VOC co-pollutants, and potentially lower utility rates if operators pass on savings from captured (rather than leaked) gas onto consumers.

In particular, DEC should impose stringent quarterly leak detection and repair (LDAR) requirements upon operators. **For New York ratepayers, the state's Public Service Commission (PSC) can exercise its leverage to incentivize LDAR programs that result in less leakage or waste.** In addition, Governor Cuomo and DEC could initiate actions consistent with neighboring states to include LDAR provisions in state-only air permits for new and modified pollution sources.

For example, as part of the state's methane reduction strategy, Pennsylvania developed air permits that require LDAR and other provisions to reduce pollution from compressor stations, pigging stations, processing plants, transmission facilities, and well sites.⁴⁰ In Ohio, regulators recently issued a permit for LDAR at compressor stations.⁴¹ The opportunity for New York to improve the control of methane emissions could be forthcoming, given DEC's stated intention to amend its Air Resources regulations to cover air emissions from the oil and gas sector.⁴²

DEC acknowledged the critical importance of LDAR during the debate over the impacts of hydraulic fracturing. In the **agency's Final Supplemental Generic Environmental Impact Statement (FSGEIS), DEC wrote that, "the Department proposes to require, via permit conditions and/or regulation, a Leak Detection and Repair Program [sic] would include as part of the operator's greenhouse gas emissions impacts mitigation plan which is required for any well subject to permit..."⁴³**

At the time, DEC intended to implement an LDAR program for shale gas wells through permit conditions and operator reporting on leak inspections, repair actions, and reasons for repair delays. **DEC could establish similar requirements related to gas infrastructure as well.** DEC's goals are the same in both cases: reducing GHG emissions and co-pollutants.

Because the state's experience from the Constitution, Valley Lateral, and Northern Access cases indicate that some operators may not provide timely information updates, New Yorkers would benefit from public/private partnerships with qualified third parties (universities, nongovernmental organizations, and private sector contractors) to complement and verify operators' LDAR programs. Third party LDAR compliance specialists receive the same training, certification, and use the same equipment as the oil and gas industry. These partnerships would both reduce the compliance burden on the industry and the enforcement burden on the regulator, potentially saving taxpayer resources.



Title V of the Clean Air Act

Under Title V of the Clean Air Act, states have the authority to declare compressor stations **“major sources” of emissions**. Compared to air permits issued by states for **“minor emission”** sources, Title V permits require more stringent pollution control technologies, assessment of pollution conditions prior to permitting, and more regular and transparent pollution reporting by operators.⁴⁴ In particular, Title V permits require operators to use **“Lowest Achievable Emissions Rate” (LAER) technologies for new or modified pollution sources in areas that do not currently meet federal air quality standards and “Best Available Control Technology” (BACT)** for such sources in areas that do.⁴⁵

Currently, more than a dozen compressor stations associated with pipelines in New York operate as **“major sources” of emissions under federal Title V air permits**.⁴⁶ In 2015, DEC approved two of these stations, the Southeast and Stony Point compressor stations along the Algonquin Incremental Market (AIM) pipeline. It was a positive decision by DEC to continue to classify these stations as Title V facilities, bringing to bear the stronger emissions controls and oversight that designation entails. However, as detailed below on state permits, DEC could have gone even further to protect air quality and health.

It is also imperative that DEC conduct careful, comprehensive analyses of compressor station **applications that claim only “minor” emissions will occur**. This is because some operators periodically seek additional permits for expansions and modifications, rather than putting forth complete plans at the time of initial application. If operators were more transparent about expansion plans, DEC would likely classify some **“minor sources” as “major sources”** from the outset.

DEC can prevent multiple, piecemeal proposals within a short time by requiring operators to provide comprehensive, forward-looking plans. This will discourage operators from underestimating potential pollution levels or phasing in plans in order to avoid Title V regulation.

Earthworks and other organizations have documented this trend in Pennsylvania, whereby operators deliberately submit a series of incremental permit modifications designed to subvert Title V major source thresholds.⁴⁷ It is prohibited under New York law for operators to **deliberately circumvent Title V requirements by “phasing, staging, delaying or engaging in incremental construction.”**⁴⁸ In both Pennsylvania and Texas, state air regulators have looked at the incremental expansion of natural gas infrastructure such as compressor stations and processing plants and determined that some deserve reclassification as major sources of emissions.

For example, the Encana Love-Crews facility in Karnes, Texas was operating under a general state air permit for minor pollution sources. After Earthworks and local residents filed complaints with the Texas Commission on Environmental Quality (TCEQ), regulators found that emissions from tanks at the facility were ten times higher than the permit allowed.



Subsequently, TCEQ required Encana to file a Title V permit application for Love-Crews, as well as other similar facilities it operated in the area.⁴⁹

In Pennsylvania, regulators in December 2016 reclassified MarkWest’s Bluestone Processing Plant as a Title V facility, but only after the facility underwent multiple expansions and modifications that included functional changes from compression to processing. Within about five years, Bluestone’s capacity and footprint grew 10-fold, while its emissions of nitrogen oxides (NOx) and VOCs tripled and CO₂ doubled. Just five months after submitting the initial Title V permit application, MarkWest, the operator of the Bluestone plant, sought to amend it by adding four more compressor engines. This effectively increased estimated carbon monoxide and particulate matter by a third and VOCs two-thirds over the levels stated in the initial Title V application.⁵⁰

B. State Policies & Regulations

New York Methane Reduction Plan

In May of 2017, New York released a state Methane Reduction Plan.⁵¹ This interagency effort put together steps to inventory, capture, and eliminate methane emissions especially from the **oil and gas sector. New York’s plan specifically calls on its agencies to “fill the void left by EPA’s abandonment of its regulatory process to address emissions from existing oil and gas sources.”**

In particular, the plan calls for implementation of:

- EPA’s Clean Air Act (CAA) methane rule 40 CFR 60 Subpart OOOOa.
- EPA’s CAA Control Technique Guidelines (CTGs) for oil and gas facilities.
- State Environmental Quality Review Act (SEQRA) guidance for GHGs, including methane.

New York could accomplish the first goal on this list through its own state methane emissions rule. Colorado⁵², California⁵³, and Pennsylvania⁵⁴ each have methane rules in various draft **stages of development and implementation. As noted throughout, New York’s methane rule should include a robust leak detection and repair (LDAR) program, tailored for pipelines and gas infrastructure.**

The second item, developing CTGs for pieces of pipelines and infrastructure, will help reduce **VOC emissions that are precursors to ozone pollution. DEC’s current Regulatory Agenda lists proposing an oil and gas sector methane rule that adopts CTG improvements, with the agency slated to begin a regulatory scoping and public comment process in early 2018.⁵⁵ (See the discussion on ozone below regarding options for New York to address ozone pollution from gas infrastructure.)**



While the CTGs focus on leaking equipment and components along the pipeline and gas infrastructure path, the SEQRA guidance on GHG emissions considers the bigger picture. This guidance will especially help New York agencies that don't have a specific environmental mandate accurately account for GHG emissions in their decisions. Modeled on federal law and guidance (discussed below), state agencies assess environmental impacts for each gas project decision before them. Agencies that determine individual GHG emission sources to be "insignificant," compared to the global problem, merely restate the nature and problem of climate change itself. This is an inappropriate method for characterizing the potential GHG impacts of pipeline and compressor station projects. A SEQRA GHG guidance would clarify the proper basis for calculating GHG emissions.⁵⁶

Funding DEC to Reduce Emissions

Governor Cuomo and the New York State legislature should ensure that DEC has the resources and personnel to enforce current and new environmental regulations and bring operators into compliance with stronger measures to reduce emissions, which will be necessary to meet the state's climate goals.

A 2012 report by Earthworks showed that even with a small existing oil and gas industry, more than 75% of active wells in New York were left uninspected each year, and that the rate of inspections had been in decline for several years.⁵⁷ In addition, an analysis by Environmental Advocates of New York showed that DEC's Divisions of Air and Water Quality Management lost nearly one-third of its staff (or 235 full time positions) between 2007-2013, while the number of facilities inspected declined by more than one-third between 2009-2012.⁵⁸

At the time, these trends sounded the alarm on DEC's ability to oversee any new operations that would have resulted from shale gas development moving forward. Such concerns remain valid today in the face of the proposed gas infrastructure buildout. DEC's budget has fluctuated in recent years, while the number of full-time staff remains only 1% higher today than in 2013.⁵⁹

State Air Permits

According to PSE's analysis, transmission compressor stations would generate the largest proportion (nearly 82%) of the additional in-state methane emissions from the proposed infrastructure buildout. To assess potential emissions from individual stations, PSE relied on project planning documents and permit applications. As noted above (see Section 3), measurements of actual emissions indicate that levels often exceed estimates in permit applications.

Given this, DEC should adopt more stringent measures to control pollution from the pipeline buildout than existing permits currently require. New York has the authority to determine the type of air quality permit needed for many types of industrial facilities that cause air pollution, including compressor stations, gas-fired power plants, and M&R stations. This state authority



extends to “major sources” that require Title V permits, “minor sources” that require state facility air permits, and low emission facilities that only have to register with the state.⁶⁰

In addition, state regulators have the authority to decide which requirements to include in state-only permits. DEC has the **discretion to set standards to prevent “emissions of air contaminants to the outdoor atmosphere...which are injurious to human, plant, or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life or property.”**⁶¹

Therefore, DEC could amend air permits to require far more stringent emissions controls (such as LAER standards for all compressor stations), air monitoring close to facilities, and regular and transparent reporting of emissions by operators to a state database. As detailed below, DEC ignored this opportunity when it permitted two compressor stations in southern New York that were part of the Algonquin Incremental Market pipeline project. Going forward, it is imperative that DEC do more to limit oil and emissions.

Stronger permit conditions to reduce air pollution from gas infrastructure would be consistent with DEC’s approach when reviewing the air and climate impacts of high-volume hydraulic fracturing for shale gas development. DEC had carefully analyzed the GHG impacts of gas production and set forth stringent measures to minimize emissions, concluding that doing so “**would also advance other long-established State policy goals, such as energy efficiency and conservation; the use of renewable energy technologies; waste reduction and recycling; and smart and sustainable economic growth.**”⁶²

A missed opportunity to reduce emissions and protect health

In 2015, Earthworks, the Clean Air Council, and Stop the Algonquin Pipeline Expansion (SAPE) submitted detailed technical comments on proposed permits for the Stony Point and Southeast compressor stations.⁶³ These stations are located along the Algonquin Incremental Market (AIM) pipeline, a project of Algonquin Gas Transmission LLC, which at the time was owned by Spectra Energy (which is now owned by Enbridge).⁶⁴

The joint comments were based on the premise that DEC has a responsibility “to ensure that operations do not degrade air quality or negatively impact the health of residents.”⁶⁵ In this case, the most directly affected residents are in Putnam, Rockland, and Westchester Counties. At the time of DEC’s permitting decision on the Stony Point and Southeast compressor stations, Rockland and Westchester **didn’t meet federal air quality standards for ozone**, and would continue to be in non-attainment under the new standard proposed by EPA.⁶⁶ In addition, both Rockland and Westchester counties are in violation of federal standards for particulate matter.⁶⁷ Both particulate matter and ozone are closely associated with respiratory and cardiac problems, such as asthma, decreased lung function, and heart attacks.⁶⁸



Fortunately, DEC determined that both the Southeast and Stony Point compressor stations would emit high enough pollution levels to merit the more stringent emissions requirements of a Title V permit. But at the same time, the agency missed an opportunity to gather data on climate and health impacts and to provide both local residents and the public with information on the impacts of the compressor stations.

The joint comments provided a roadmap for DEC to include several requirements to help reduce pollution and protect health. These included:

- Protocols for regular air monitoring of VOCs, hazardous air pollutants, and federally regulated air pollutants released by the facilities. This would include stack monitoring to capture spikes in air pollution or episodic emission events, which research has shown are associated with the onset of health symptoms among residents living near compressor stations.⁶⁹ We also recommended fence-line monitoring of air quality managed by state or county Departments of Health and of Environmental Conservation, funded by the operator, and conducted by reliable third parties.
- Use of the EPA Natural Gas STAR guidelines, which specify practices operators can take to reduce emissions of methane and other pollutants.⁷⁰ For example, operators could be required to redirect gas into the system rather than venting it into the atmosphere during blowdowns (i.e., pressure releases).
- Notification to local residents of blowdowns or other large emissions and/or noise events that would allow sufficient time (e.g., 72 hours) to either leave the area or take measures to limit exposure.
- Comprehensive, reliable, and verified analysis of fugitive emissions from across the proposed pipeline project, including all equipment at compressor stations. This information is essential to determine the extent of potential leaks of methane and VOCs, as well as the pollutant content of the specific gas slated to move through the system.

After New York issued the Title V permits, local officials and advocates petitioned EPA to object **to the state's decision, based on concerns with DEC's review of the impacts of the Stony Point and Southeast compressor stations.** Petitioners noted inadequate consideration of fugitive emissions, a lack of proper emissions limits for certain equipment, and an inappropriate reliance on baseline air monitoring data from miles away in Pennsylvania.⁷¹

In 2016, Clean Air Council, Earthworks, and SAPE initiated discussions with DEC on the potential to include our recommendations from the Southeast and Stony Point compressor station comments in future projects. Going forward, DEC should ensure a more thorough review of Title V permit applications—in turn providing nearby communities with air monitoring and the state with more accurate data on emissions that impact climate, air quality, and health.



Addressing Ozone

The Clean Air Act requires EPA to set ozone standards and allows states to implement plans to attain them.⁷² However, nearly one-third of the US population lives in areas classified as “non-attainment” for ozone, meaning they fall short of meeting EPA’s standard.⁷³ Ozone forms when emissions of VOCs and NOx combine with sunlight. The resulting smog causes respiratory, cardiovascular, and pulmonary problems and in some cases, premature death.

Among other sources (such as power plants and motor vehicles), the oil and gas industry emits large volumes of the pollutants that form ozone. A 2016 analysis by the Clean Air Task Force (CATF) indicates that across the US annually, oil and gas pollution causes more than 750,000 summertime asthma attacks in children, 2,000 asthma-related emergency room visits, and 600 respiratory-related hospital admissions.⁷⁴ In 2014, a study by CATF and environmental organizations found that EPA’s methane rule would have the added benefit of reducing the co-pollutants that form ozone by 16-23 percent.⁷⁵ A growing body of research also points to the importance of including measures to limit methane in ozone reduction strategies.⁷⁶

DEC currently classifies ten New York counties as in “moderate non-attainment” for ozone according to the 2008 federal standard of 75 parts per billion (ppb).⁷⁷ According to DEC, under the more stringent 70 ppb standard proposed by EPA in 2015, the nine counties in the southern part of the state in and around the New York City metropolitan area would continue to be classified as moderate non-attainment for ozone. One western New York non-attainment county (Erie) would be re-designated as in attainment, and the rest of the state would remain in attainment for ozone.⁷⁸



Emissions seen with optical gas imaging, Minisink Compressor Station, Orange County, New York. Images by Earthworks.

New York is part of the Ozone Transport Region (OTR), a multi-state compact established under the Clean Air Act to address persistent ozone pollution in the Northeast and Mid-Atlantic states.⁷⁹ **Under rules of the OTR, states must require industries to use “Reasonably Available Control Technology” (RACT) to reduce emissions of ozone-forming pollutants.**⁸⁰

RACT is also the basis for Control Techniques Guidelines (CTGs) issued by the EPA in 2016 to help reduce ozone-forming pollution from oil and gas operations nationwide.⁸¹ The oil and gas CTGs prevent VOC pollution from equipment leaks (i.e., fugitive emissions), compressor engines, storage tanks, and valves and pumps—all of which are part of the pipelines and associated infrastructure that help transport and deliver natural gas.⁸²

Currently, states that have areas in non-attainment for ozone and are part of the OTR, including New York, are required to integrate the CTGs for oil and gas operations into their state implementation plans (SIPs).⁸³ **To DEC’s credit, the agency’s current Regulatory Agenda states the intention to address and expand upon EPA’s 2016 CTGs by developing enforceable regulations to reduce air pollution from the oil and gas sector, including from ozone and methane.**⁸⁴ **DEC’s actions to develop and implement a comprehensive, strong state regulation to address pollution from the oil and gas industry will become even more essential since EPA announced in December 2017 its intent to eliminate the CTGs for the sector.**⁸⁵

As is the case with many federal regulations, the CTGs provide a “floor,” not a “ceiling” for states. With state authority to fill the regulatory air space in mind, New York should adopt strong rules to limit oil and gas pollution regardless of what EPA does with regard to the CTGs, new ozone standard, and methane rule.

For example, DEC should limit permits for proposed compressor stations along pipelines in ozone nonattainment areas or areas at risk of falling into non-attainment.⁸⁶ New York should also consider the risk of gas infrastructure emissions traveling downwind to non-attainment areas from elsewhere. In fact, New York recently sued the EPA to add nine Midwestern and Southern states to **the OTR, based on evidence that air pollution from these “upwind” states causes portions of the Northeast to fail the ozone standard.**⁸⁷

Finally, New York could expand its air monitoring network for ozone, NOx, and VOCs to increase coverage closer to locations where compressor stations are in the planning stages or under construction. Since state and federal air monitors are located on the basis of population and intended to cover large regions, they are often far from where oil and gas development occur. Currently, neither DEC nor EPA operate ground level ozone monitors that could capture pollution from facilities in the proposed gas infrastructure buildout. In particular, existing monitors are about 10-100 miles from the proposed transmission compressor stations.⁸⁸



CEQ, SEQRA, and NEPA

New York's State Environmental Quality Review Act (SEQRA)⁸⁹ essentially functions as a state version of the National Environmental Policy Act (NEPA)⁹⁰, a bedrock federal environmental law. SEQRA requires state agencies to assess the environmental impact of their decision-making. This includes analyzing GHG emissions.

We support DEC's recommendation in New York's Methane Reduction Plan to update and improve SEQRA guidance analogous to the Council on Environmental Quality's (CEQ) Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions in National Environmental Policy Act Reviews (GHG Guidance).⁹¹ CEQ developed the GHG Guidance to help agencies calculate and account for life cycle greenhouse gas emissions in their environmental analyses.

The GHG Guidance provided tools for agencies to calculate indirect and cumulative GHG emissions. It advised agencies to estimate GHG impacts beyond the narrow, segmented, or piecemeal lens of individual permit **applications. In addition, it sought to end the "not my department" ethic that some agencies without an environmental mission have brought to climate analysis.** The Trump Administration withdrew the GHG Guidance on April 5, 2017.⁹²

Of particular note, the GHG Guidance helped agencies without a specific mandate for environmental protection, like FERC, better analyze GHG emissions when reviewing and permitting projects. The tradition in FERC pipeline and gas infrastructure decisions tends to, if at all, view climate change as insignificant (see below). When FERC does assess climate change impacts, the Commission often does not cumulatively consider connected pipeline infrastructure plans, ignoring the upstream and downstream emissions.

For example, FERC reviewed the Atlantic Bridge and Access Northeast pipeline projects proposed to connect with the AIM Pipeline. The operator, Spectra Energy (now Enbridge), designed these projects to increase compression capacity in its Northeast pipeline corridor, with Access Northeast representing the third project in just a few years along the same route with the same compressor stations. In the Environmental Impact Statement (EIS) on the AIM Pipeline, FERC acknowledged that the project would be similar to Atlantic Bridge, stating that **both would have "facilities within the same region of influence" and that "air emissions during operation of compressor stations would overlap."**⁹³ Yet, the Commission dismissed any consideration of the cumulative impacts of the three overlapping projects. (On June 29, 2017, Enbridge withdrew its application to FERC for Access Northeast.)

In contrast, the GHG Guidance advised that **"proposed resource extraction and development projects typically include the reasonably foreseeable effects of various phases in the process, such as clearing land for the project, building access roads, extraction, transport, refining, processing, using the resource, disassembly, disposal, and reclamation."**⁹⁴ Even though some of these activities fall outside FERC's (or any single agency's) jurisdiction, the GHG Guidance suggests that FERC should still weigh the collective GHG impact of projects within a region.



In the natural gas infrastructure context, the GHG Guidance served as a check on FERC. In July of 2016, EPA told FERC their review of the Northern Access pipeline failed to properly account for methane leaks and indirect upstream and downstream emissions.⁹⁵ Later in October 2016, EPA chastised FERC again for insufficiently analyzing the climate change impacts of TransCanada Corporation's proposed Leach XPress pipeline through parts of Pennsylvania, West Virginia, Ohio, and Kentucky.⁹⁶ Each time, EPA cited the GHG Guidance.

New York agencies can fill the void created by the Trump Administration's repeal of the GHG Guidance by developing and implementing one based on SEQRA. The SEQRA-based guidance should help address problems of illegal segmentation, piecemeal permitting, and limited consideration of GHG emissions. The practical effect would help New York understand how individual pieces of natural gas infrastructure fit into the broader system of GHG emissions and subsequent impacts on both the state's air quality and climate goals.



Forest cut for construction of the Millennium Pipeline, Broome County, New York. Photo by Roger Luther, nyslandmarks.com.

Reducing demand for natural gas

Currently, residential use of gas for heating and appliances is on the rise in New York. Some of **this growth appears to be the result of New York’s “fuel switching” policies to convert heating systems from oil to gas, purportedly to realize GHG reductions.** But this trend may have the opposite effect and lead to increased GHG emissions over the long-term.

According to the PSE analysis of the gas infrastructure buildout, in New York’s residential sector, “average CO₂ emissions from homes that use natural gas is about 20% higher than from homes that use petroleum liquids for heating, a difference that is magnified when lifecycle methane emissions are also included. This difference is likely the result of homes using natural gas not only for heating, but also for appliances such as clothes dryers and water heaters.”⁹⁷

Such patterns demonstrate the need for complete fuel switching, that is, a rapid transition from all fossil fuels to renewable sources of energy. This would be consistent with the focus in **New York’s climate plan on changing the electric power sector to reduce GHGs, with an officially established goal of 50% of electricity coming from renewable energy sources by 2030.**⁹⁸

Yet despite their potential for increasing GHG emissions, new power plants are being developed in New York that would run on gas (in particular the CPV and Cricket Valley plants in southern New York). These plants would not only be GHG emitters themselves, but they would also rely on pipelines and compressor stations that would increase emissions from the electric power sector.

New York’s Department of Public Service (or Public Service Commission, PSC) oversees decisions on utility services and rates for residential and non-residential consumers. PSC has a role to play in reducing demand for natural gas and moving the state more firmly toward the use of renewable energy. For example, it could decide to not approve new proposals to base consumer rates on the projected increase in natural gas consumption, including through gas-fired power plants and pipeline projects.

These types of decisions could benefit consumers, since reliance on gas to generate electricity can result in both spikes and rapid fluctuations in utility rates. A 2015 analysis by the Union of Concerned Scientists rates New York as being at moderate to high risk of over-reliance on natural gas in the electric sector for this reason.⁹⁹

Notably, if the proposed gas infrastructure buildout occurs but consumer demand decreases—the **hoped-for outcome underlying New York’s energy efficiency and renewable energy goals**—the state could end up with **“stranded assets” of aging infrastructure. In other words, pipelines, compressor stations, and other infrastructure could be rendered obsolete—leaving consumers at risk of being saddled with the costs of assets that are no longer being used.**¹⁰⁰

5 — Conclusions and Recommendations

Nationwide, decisionmakers at all levels of government grapple with ensuring reliable energy supplies. The status quo response to this challenge—more fossil fuels—increasingly clashes with the need to prevent further degradation of air, water, land, health, and the climate. While the shale gas and oil boom initially seemed to many to be part of the solution, growing evidence of harm has underscored that it is, in fact, a big part of the problem.

Under Governor Cuomo, New York State has positioned itself as a leader in addressing climate change and a necessary transition to clean energy. This report has examined New York's path forward through the lens of one central question:

Can New York achieve its climate targets while pursuing the build out of currently proposed natural gas infrastructure?

Based on PSE's technical analysis of projected greenhouse gas emissions from pipelines and associated infrastructure, the answer is a resounding no.

To improve Governor Cuomo's chances of meeting his energy-related GHG reduction goal of 40% by 2030, his Administration should deny permits for pipelines and associated infrastructure. In addition, state regulators must do more to restrict emissions—from both new and existing operations—that impact health and climate, especially through narrowly tailored permit conditions.

To date, despite slashing the use of coal and oil, New York has made only limited progress on reducing GHG emissions—in large part the result of growing reliance on natural gas. The buildout of natural gas transportation and delivery infrastructure will only make New York's climate goals more difficult, if not impossible, to achieve. In short, unless New York implements concrete strategies to reduce the consumption of natural gas, the state will squander the opportunity to be a true leader on climate and clean energy.

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Fortunately, New York decisionmakers still have time to prevent the otherwise inevitable clash between its climate goals and pollution from the proposed gas infrastructure buildout. On the policy and regulatory front, DEC can improve permitting, assessing climate impacts, and limiting emissions. This will require that:

- 1) [DEC exercises its authority under the Clean Air Act and Clean Water Act to restrict or deny permits for pipeline projects.](#)

PSE’s analysis shows us the “low hanging fruit” available to DEC to avoid significant proportions of GHG emissions from the proposed gas infrastructure buildout. Just two pipelines (Constitution & Iroquois Gas Wright Interconnect Project and the Transcontinental Gas Northeast Supply Enhancement) account for more than half (56%) of the estimated increase in CO₂ emissions.

In addition, if just the pipelines currently on hold and in planning stages were not built, additional emissions would be 85% less.

Proposed transmission compressor stations would generate nearly 82% of the additional direct methane emissions. More than 60% percent of these emissions from proposed transmission and storage compressor stations would come from projects in the initial planning stages or currently under agency permit review.

As detailed above, DEC can exercise Clean Air Act authority in developing emissions controls (for example, requiring Reasonably Available Control Technology in ozone nonattainment areas). As DEC did with the Constitution and Millennium Valley Lateral pipeline projects, the agency can flex its Clean Water Act muscle by denying Section 401 **water quality certifications for pipelines that pose harm to New York’s water resources.**

- 2) [DEC, NYSEERDA, and other relevant agencies develop a robust set of strategies to fill state and federal gaps in addressing methane emissions.](#)

Implement the state’s 2017 Methane Reduction Plan. DEC needs to establish timelines and initiate rulemakings (including opportunities for public participation) to make the broad goals in the plan a reality.

Establish state requirements for regular LDAR and emissions reporting and control of ozone-forming pollutants applicable to both gas wells and infrastructure. DEC should move swiftly to advance a rulemaking to address emissions from the oil and gas sector. In particular, DEC should require operators to develop and implement quarterly LDAR programs. DEC should complement this requirement by partnering with trained and certified third party LDAR inspectors, the work of whom will help reduce the waste of gas operators can instead sell and potentially save consumers money.

Develop incentives for utilities and interstate pipeline operators to track and repair leaks along pipelines and from equipment at transmission and distribution stations. New



York's Public Service Commission can negotiate terms that encourage LDAR programs for regulated utilities. Reducing leaks means less wasted gas, which could in turn translate into better returns for utilities and ratepayers.

Update a SEQRA guidance to ensure that state agencies adequately address GHGs (including methane) during environmental reviews for gas infrastructure projects. This guidance would encourage New York regulators to view GHG emissions holistically, with an eye to lifecycle emissions and impacts on the global climate—rather than limiting consideration of GHG sources to the individual activities included in the permit filing, which ignores upstream and downstream emissions and their impacts.

3) **DEC adopts more robust permit conditions and conducts more thorough permit application reviews. In particular, the agency should:**

Require that operators use the EPA Natural Gas STAR guidelines to control emissions from a range of equipment.

Limit permits for proposed compressor stations along pipelines in and upwind of ozone nonattainment areas or areas at risk of falling into non-attainment.

Carefully scrutinize emissions estimates and require forward-looking plans from operators to **prevent potentially illegal circumvention of “major source” Title V requirements.**

Conduct frequent, thorough inspections to ensure operator compliance with LDAR requirements, including partnering with qualified third-party verifiers who can complement state and operator LDAR programs.

At the time of writing, Governor Cuomo has announced that New York will divest its pension fund from fossil fuels in order to **“de-carbonize” the investments of state residents.**¹⁰¹ In addition, New York City has filed a lawsuit against several large oil companies for knowingly increasing climate threats to businesses and residents, which in turn force the city to incur growing mitigation and repair costs.¹⁰²

These actions reflect strong awareness among New York decisionmakers of the urgency of climate change and the need to rapidly reduce fossil fuel use. But still missing from this stance is recognition of the fact that building more pipelines and compressor stations contradicts state goals and responsibilities, in this case climate change mitigation and increased use of renewable energy.

In 2014, New York took a monumental step that has helped avoid potentially dramatic GHG emissions increases: prohibiting the production of natural gas from deep shale deposits. Now, as then, there are equally important choices to make regarding the gas infrastructure buildout. Just as during the years of anti-fracking organizing, residents statewide are resisting



infrastructure projects, demanding protection from the subsequent impacts to air and water quality, and seeking clean energy options.

There is clearly much more that Governor Cuomo, DEC and other agencies, and state and local officials can do to prevent New York from getting locked into even greater reliance on fossil fuels for decades to come. For the sake of the climate and residents statewide, the time has come to rapidly and fully commit to a clean energy future.



New Yorkers rally in 2016 to stop construction of the Algonquin Incremental Market pipeline. Photo by Erik McGregor/Pacific Press.

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