

## Fact Sheet on Natural Gas Transmission Pipelines

### 1. What is natural gas?

Natural gas is primarily methane (chemical formula CH<sub>4</sub>). Methane is a greenhouse gas with an average lifetime of a molecule in the air of 12 years. It is destroyed in the air by a chain of chemical reactions that usually result in carbon dioxide being created. Methane, pound for pound, traps 34 times more heat than carbon dioxide. (Technically this is called the global warming potential, GWP, which accounts for the heat trapping for 100 years compared to the GWP of carbon dioxide taken as 1. If the GWP is taken over 20 years, the GWP becomes 86 which is a number sometimes quoted. However 100 years is the standard time for computing GWP).

### 2. Why is natural gas called “clean energy”?

Natural gas is touted as clean energy. It does produce 50% less carbon dioxide per unit of energy produced than coal. However since it is a greenhouse gas in its own right, any leakage of raw, unburned methane reduces its benefit over coal. Estimates of methane leakage from natural gas production and transmission are 25% to 33% of all methane emissions in the United States.<sup>a</sup>

This is equivalent to releasing about 50 million tons of carbon dioxide into the atmosphere.<sup>b</sup>

a. “Methane Emissions from Modern Natural Gas Development,” PSE Healthy Energy Science Summary, March 2014, [psehealthyenergy.org](http://psehealthyenergy.org).

b. “America Pays for Gas Leaks, Natural Gas Pipeline Leaks Cost Consumers Billions,” Senator Edward Markey and House of Representatives Natural Resources Staff, August 1, 2013, [http://www.markey.senate.gov/documents/markey\\_lost\\_gas\\_report.pdf](http://www.markey.senate.gov/documents/markey_lost_gas_report.pdf).

### 3. Why are gas pipeline expansions being proposed?

The natural gas industry is rapidly increasing the capacity of gas transmission lines in the United States. One of the reasons is to increase the supply of natural gas from hydraulic fracked wells in Pennsylvania.<sup>a</sup> “The Interstate Natural Gas Association of America has estimated that from 2011 to 2033 the industry must build nearly 15,000 miles of subsidiary lines – each year.”<sup>b</sup>

a. [http://www.northeastgas.org/pipeline\\_expansion.php](http://www.northeastgas.org/pipeline_expansion.php).

b. Marcia Greenberg, *The Washington Post*, October 17, 2014.

### 4. What will happen if more natural gas is transmitted and used?

Natural gas has been proposed as a bridge fuel meaning that replacing coal-fired power plants with gas-fired power plants would lower greenhouse gas emissions. This would make sense if the leakage of methane was drastically reduced. However, the gas industry has had little

incentive to do anything. The expansion of natural gas that is taking place will make emissions much worse. A recent study has shown that expanding natural gas production could increase carbon dioxide emissions by 11% by 2050.<sup>a</sup>

a. H. McJeon *et al.*, “Limited impact on decadal scale climate change from increased use of natural gas,” *Nature* **514**, 482 (2014), [http://www.nature.com/articles/nature13837.epdf?referrer\\_access\\_token=M12woI6qbFsA2\\_mby-2xz9RgN0jAjWel9jnR3ZoTv0MPa9R-hb8QnGG9oaO-IVuwCEcD2ITjfa54l8hpMJZmaa\\_bhgwdDar9F\\_NdOvAlwN1UuUiHB2eDLVmJo1q0xBt](http://www.nature.com/articles/nature13837.epdf?referrer_access_token=M12woI6qbFsA2_mby-2xz9RgN0jAjWel9jnR3ZoTv0MPa9R-hb8QnGG9oaO-IVuwCEcD2ITjfa54l8hpMJZmaa_bhgwdDar9F_NdOvAlwN1UuUiHB2eDLVmJo1q0xBt).

### 5. Why should we oppose the expansion of natural gas pipelines through Connecticut?

A. Gas transmission lines are used to transport natural gas large distances. The gas is pressurized between 200 to 1500 psi (15 to 100 times atmospheric pressure) to reduce its volume. The largest transmission line in Connecticut is the Algonquin Pipeline that goes through the middle of Connecticut including going through Coventry, Mansfield, and Chaplin as shown below. To keep the gas at high pressure, it must be pressurized again after 40 to 100 miles of travel.



There are several compressor stations in Connecticut for this purpose. One compressor station is in Cromwell, one in Oxford, and one is located on the Mansfield –Chaplin line at 539 Tower Hill Rd. To measure gas flow, there are 13 metering and regulation stations in Connecticut. Every five to twelve miles along the pipeline, there are valves in case part of the pipeline has to be isolated.

B. Spectra Energy which owns the Algonquin Pipeline has proposed three expansions projects. The most immediate one that is furthest along the Federal approval process, slated to start in 2015, is named the Algonquin Incremental Market (AIM) expansion. A second expansion project, which has just begun the approval process, is called Atlantic Bridge. Access Northeast is a third project announced by Spectra Energy that will collaborate with Northeast Utilities and is supposed to complement Spectra Energy's previously announced AIM and Atlantic Bridge projects. The details of the Access Northeast expansion have not been specified, but it is proposed to start in 2018 and may involve electric generation at power stations. "Access Northeast would add one billion cubic feet of natural gas capacity to the New England gas transmission system."<sup>a</sup>

a. Luther Turmelle, "Northeast Utilities part of \$3 billion plan to expand natural gas pipeline in Connecticut, New England," New Haven Register, September 16, 2014

C. The AIM project in Connecticut will replace 13.5 miles of six-inch diameter pipe in Lebanon, CT with 16-inch diameter pipe and 13.5 miles of 26-inch diameter pipe in Danbury, CT with 42-inch diameter pipe. The operating pressure would increase to 850 psi for the 42-inch pipe from 674 psi for the 26-inch pipe. The project also includes new 3.3 miles of 12-inch diameter pipe in Montville, CT and 36-inch diameter pipe in Cromwell and Rocky Hill, CT. The Cromwell Compressor Station will have its capacity increased by 15,900 horsepower, and the Chaplin Station's capacity will increase by 7,700 horsepower. Modifications will also be made to 13 existing metering stations (West Danbury, Southbury, Waterbury, North Haven, Guilford, Farmington, Glastonbury, Middletown, Salem, Montville, Willimantic, Pomfret and Putnam, CT), and construction of one new metering station in Oakland Heights (Norwich). Every M & R station will have major modifications and several will be completely re-built, Glastonbury and two others.<sup>a</sup> **The purpose of AIM is to increase the amount of natural gas that can be transported through Connecticut.**

a. <http://www.nae.usace.army.mil/Missions/Regulatory/PublicNotices/tabid/11771/Article/494068/nae-2013-01233.aspx>.

## **6. What do scientists say about the burning of fossil fuels including natural gas?**

A recent paper (C. McGlade and P. Ekins, "The geographical distribution of fossil fuels unused when limiting global warming to 2°C," *Nature* **517**, 187-190 (2015)) states "that to have a 50 per cent chance of limiting warming below 2°C throughout the twenty-first century, cumulative carbon emissions between 2011 and 2050, need to be limited to about 1,100 gigatonnes of carbon dioxide (Gt CO<sub>2</sub>).<sup>a</sup>" A gigatonne is the same as a billion tons. Most scientists have agreed that limiting warming to 2°C is the maximum that our civilization could stand without major damage to health, food and water supplies, the survival of many species, and livable habitats. The results

of the paper “suggest that, globally, a third of oil reserves, half of gas reserves and 80 per cent of coal reserves should remain unused from 2010 to 2050 in order to meet the target of 2°C.” **Since the world is currently producing emissions of over 30 Gt CO<sub>2</sub> per year, we need to reduce fossil fuel use not increase it.**

### **7. Why should we oppose new gas compressors?**

The new compressors that come with the AIM expansion will increase greenhouse gases. Compressors are the cause of most leakages of methane into the air from natural gas production. About 57% of the leaked methane comes from the compressors used in transmission pipelines.<sup>a</sup> Since natural gas production is responsible for about 25% of all methane emissions, compressors are an important source of methane emissions.

a. Report for Oil and Gas Sector Compressors, U S EPA Office of Air Quality Planning and Standards, April 2014.

### **8. Who will pay for the pipeline expansions?**

The original plan to pay for the expansion of the gas transmission pipelines through New England was to have the electricity ratepayers finance it through a Federal tariff on their electricity bills. The New England states have a committee to coordinate energy requirements, the New England Committee on Energy (NESCOE). This committee requested from the Federal Energy Regulatory Committee, “The New England States preliminarily agree, through NESCOE, that recovery of the net cost of any such procurement of firm pipeline capacity be collected through the Regional Network Services rate shared appropriately among the New England States.... NESCOE requests that all possible efforts be made to secure approval of the tariff as expeditiously as possible and with the objective of allowing commitments to be made that would permit the new pipeline capacity to be available no later than the winter of 2017/18.”<sup>a</sup> However Governor Deval Patrick of Massachusetts withdrew his support for this plan. The method of payment for the pipeline expansions is now undecided.<sup>b</sup>

a. Memo from New England States Committee on Energy, “Request for ISO-NE technical support and assistance with tariff filings related to electric and natural gas infrastructure in New England,” January 21, 2014, signed by representatives of the governors all the New England states including Katie S. Dykes, Deputy Commissioner of Energy, Connecticut Department of Energy and Environmental Protection.

b. [http://www.bizjournals.com/boston/blog/mass\\_roundup/2014/08/gov-patrick-backs-away-from-regional-effort-to.html?page=all](http://www.bizjournals.com/boston/blog/mass_roundup/2014/08/gov-patrick-backs-away-from-regional-effort-to.html?page=all).