Is natural gas a “bridge fuel”?

Natural gas has been promoted as a “bridge fuel” that can help the U.S. reduce global warming pollution by replacing coal-fired electricity generation and buying time to develop more wind, solar and other clean energy sources. This argument rests on the fact that combustion of natural gas releases about half as much carbon dioxide as generating the same amount of electricity by burning coal. But while combustion is the greatest source of climate emissions for oil and coal, recent research finds that natural gas’ most significant climate impacts may occur before combustion ever takes place.

Methane leaks mean high emissions

Methane, the primary component of natural gas, traps at least 86 times more heat in the atmosphere over 20 years than does the same amount of carbon dioxide. As a result, even small methane leaks during the production, processing, storage and transportation of natural gas can negate its low emissions of carbon dioxide during combustion.

A review of multiple studies finds evidence of high methane leakage rates from both unconventional sources of natural gas, such as shale gas produced through fracking, and from conventional sources of gas that we’ve tapped for decades. These methane leaks can be significant enough to erode or nullify any climate benefits of natural gas.
Studies find high methane leaks

Recent studies relying on a variety of methodologies and looking at drilling in different places have found methane leaks high enough to significantly undercut any climate benefits from natural gas. A 2011 study by Professor Robert Howarth of Cornell University estimated that 3.8 percent of conventional natural gas is lost to the atmosphere and that 5.8 percent of gas obtained from shale formations is lost. This would mean 1.5 trillion cubic feet of methane leaked in 2014, with a global warming impact equivalent to 251 coal-fired power plants. Other studies have confirmed leakage rates are at least this high.

- Aircraft-based air sampling over Colorado’s Front Range allowed researchers to estimate that 4.1 percent of natural gas produced in the area escapes into the atmosphere.
- In southwestern Pennsylvania, an area with extensive fracking activity, researchers estimate that 7 percent of natural gas produced in the region escapes to the atmosphere.
- A 2015 study by Professor Howarth estimated that 12 percent of shale gas production is lost to the atmosphere, based on a 2014 study that relied on satellite data to estimate methane leakage from North American shale formations. That 2014 study found that atmospheric methane concentrations in major shale-producing regions grew dramatically after 2008, a period of heavy shale oil and gas well development.
- Another study using satellite-based measurements documented a 30 percent increase in methane emissions in the past decade, particularly in the central U.S. where oil and gas production has increased.

Develop truly clean energy sources

The growing concerns about methane leaks from natural gas raise the level of urgency for the United States to implement clean, renewable sources of energy – such as solar and wind power – that have unambiguous benefits for the global climate. In addition, the United States should slow efforts to develop gas resources using dangerous technologies such as fracking that have major impacts on public health and the environment.

Renewable energy is virtually limitless

The United States has the potential to meet its current electricity needs more than 100 times over with solar energy and more than 10 times over with wind energy, according to the National Renewable Energy Laboratory.

Energy efficiency improvements could slice our consumption of energy by 40 to 60 percent by mid-century, according to the American Council for an Energy-Efficient Economy.

Renewable energy is booming

Solar energy worldwide has grown faster than even the most optimistic forecasts made by groups such as Greenpeace.

The price of key clean energy technologies such as solar panels, wind turbines, batteries and energy efficient light bulbs is plummeting. In many parts of the country, wind energy is now the cheapest source of new electricity generation, and solar power is on track to be the least expensive form of energy in much of the world in the near future.

A 100% renewable future is within reach

There are no insurmountable technical or economic barriers to 100 percent renewable energy. Researchers in academia, government and the nonprofit sector have proposed viable pathways by which the U.S. and the world can transition our economy to run on 100 percent clean, renewable energy. Those pathways generally call for:

- Ramping up production of renewable energy from sources like the sun and wind.
- Switching to efficient electric vehicles for transportation and to electricity for home heating and other purposes for which we currently burn fossil fuels.
- Getting the most out of the energy we use through improved energy efficiency.

For more information and the full report, please visit www.FrontierGroup.org

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