

'Bridge' fuel may escalate atmospheric greenhouse gas

October 13 2015, by Blaine Friedlander

While the U.S. Environmental Protection Agency (EPA) suggests there has been a decline in measurable atmospheric greenhouse gas emissions from fossil fuel use in the U.S. for the past seven years, a Cornell scientist says the EPA's computation may be in error – by a wide margin – due to problematic accounting for natural gas, the so-called "bridge" fuel.

Instead, thanks to a heavier dose of <u>methane</u> emissions resulting from increased use of <u>shale gas</u>, <u>greenhouse gas emissions</u> in the U.S. may have been rising rapidly over that time.

In 2013, the EPA has estimated <u>greenhouse gas</u> emissions in the United States – including methane from natural gas – at about 6 petagrams, or 6,000,000,000,000,000 grams into the atmosphere. By using better accounting for methane as a key greenhouse contributor, the emissions to the atmosphere are closer to 9.5 petagrams, according to Robert Howarth, Cornell's David R. Atkinson Professor of Ecology and Environmental Biology. By 2040, greenhouse gas emissions from U.S. fossil fuel use (including methane) could be close to 12 petagrams.

"The EPA has seriously underestimated the importance of methane emissions in general – and from shale gas in particular," said Howarth, a fellow in Cornell's Atkinson Center for a Sustainable Future, who published "Perspectives on Air Emissions of Methane and Climatic Warming Risk from Hydraulic Fracturing and Shale-Gas development: Implications for Policy," in the journal *Energy Science and Engineering*



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"As a result, the federal government has been stating that total greenhouse gas emissions from energy use in the U.S. have been steadily declining since 2008 – which they attribute to exchanging shale gas for coal for electricity generation – although other studies say the economic downturn was more important."

Howarth said methane accounts for 40 percent of total U.S. greenhouse gas emissions. Shale gas development over the past 8 years may be further increasing the rising average temperature of the Earth, compared to the pre-industrial baseline.

Methane resides in the atmosphere for just over a decade, a relatively short time compared to carbon dioxide, which lasts for hundreds of years. However, methane is 100 times more powerful than carbon dioxide as a global warming agent in the atmosphere. Curbing methane emission reductions leads to instant atmospheric concentration reductions that significantly slow global warming rates almost immediately, said Howarth.

Within the next 15 years, Earth will warm to very dangerous levels, doubling the total increase in the average temperature that has occurred since the start of the industrial revolution to now, said Howarth. Tipping points in the climate system may kick in and lead to runaway global warming.

The natural gas industry is the largest source of <u>methane emissions</u> in the U.S. By reducing methane and soot (black carbon) emissions, society can buy time while moving aggressively toward a renewable energy economy, said Howarth.

While it is essential to reduce carbon dioxide emissions, this alone would



result in no measurable improvement on global warming rates in less than 30 years, he said.

"Methane <u>emissions</u> make it a disastrous idea to consider shale gas as a bridge fuel, letting society continue to use fossil fuels over the next few decades," Howarth said. "Rather, we must move as quickly as possible away from all fossil fuels – shale <u>gas</u>, conventional <u>natural gas</u>, coal and oil – and toward a truly sustainable energy future using 21st-century technologies and wind and solar power."

Provided by Cornell University

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