



CORNELL STUDY FAST FACTS UNCONVENTIONAL PRODUCTION VS. UNCONVENTIONAL STUDY

A study from Cornell University suggests that natural gas production climate benefits have been vastly overstated, largely due to the method of extraction known as hydraulic fracturing (HF).¹ At issue is the amount of methane – a greenhouse gas (GHG) – released in to the atmosphere and whether this amount is significant enough to curtail the benefits of natural gas over other fossil fuels such as coal.

Author of the study, Professor Robert Howarth claims: “Compared to coal, the footprint of shale gas is at least 20 percent greater and perhaps more than twice as great on the 20-year horizon.” This has yielded significant skepticism from industry, academia, and some environmental groups as Howarth seeks to dispel the proven benefits of a clean-burning, abundant, and domestically available energy source by use of questionable scientific practices.

The following problems are worth identifying to prevent the additional propagation of this misinformation:

Problem # 1: The study relies on lost and unaccounted for gas (LUG). LUG is calculated from the difference of the amount of recorded methane from the well and the point of sale. Howarth claims 3.6 percent of gas produced potentially never make it to consumers, which means it is leaked or stolen.

Fact Check: The term LUG is more of a measurement and reconciliation tool than an emissions issue. To further explain, equipment used to process gas, including compressors that move gas through the gathering systems operate on natural gas. This gas is typically deducted from the producer’s total gas. In other words, Howarth’s emissions are an accounting tool, not a measured loss.

Problem #2: The Cornell study uses a 20-year timeframe to study Global Warming Potential (GWP)² of methane in the atmosphere with an attributable value of 105.

Fact Check: The 20-year timeframe is too short and not appropriate for public policy analysis.³ A more common standard and one the United Nation’s Intergovernmental Panel on Climate Change (IPCC) recommends is a 100-year horizon with a value of 72 over a 20-year period.⁴ Howarth’s 105 GWP value, stemmed from a single study⁵ that has yet to be internationally peer reviewed, is 46% higher than IPCC’s assessment. According to the U.S. Environmental Protection Agency (EPA), methane disperses after 15

¹ R.W. Howarth, R. Santoro and A. Ingraffa, “Methane and the Greenhouse-Gas Footprint of Natural Gas From Shale Formations.” Available at: [http://www.eeb.cornell.edu/howarth/Howarth et al 2011.pdf](http://www.eeb.cornell.edu/howarth/Howarth%20et%20al%202011.pdf).

² The concept of GWP was developed to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. The IPCC has published referenced values for GWPs of several greenhouse gases including methane. EPA analyses use the 100-year GWP listed in the IPCC’s Second Assessment Report consistent with international standards under the United Nations Framework Convention on Climate Change (UNFCCC). <http://www.epa.gov/highgwp1/scientific.html> (last accessed April 20, 2011).

³ Dan Lashof, Director, Climate Center, NRDC, on Staff blog, April 12, 2011.

⁴ <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-errata.pdf> (last accessed April 20, 2011).

⁵ D.T. Shindell et al. “Improved Attribution of Climate Forcing to Emissions”. Science vol 326: pp. 716-718 (30 October 2009).



years, compared to a 100-years-or-longer period for CO₂.⁶ In other words, methane is long gone from the atmosphere in a much shorter timeframe than CO₂.

Problem #3: Much of the data used to reach the study's conclusion was subpar. Howarth admits a lot of the data used was "really low quality".⁷ This includes: unpublished data gathered from PowerPoint presentations, long-range transmission losses reported in Russia, and LUG data from a trade magazine in Texas.

Fact Check: Most of the data presented were not actual emissions figures, but calculated extrapolations assuming that operations were uniform across every basin and operator. Questionable data and unfounded methodology resulted in a compounded overstatement of natural gas emissions.

What others are saying about the Cornell Study:

"What he [Howarth] has done in his analysis is deviated from what are accepted standards, accepted by EPA, DOE, the IPCC, European Trading Scheme, California Air Resources board, where essentially the denominator that they use to calculate the impacts of various greenhouse gases is an agreed upon 100 years; Professor Howarth uses 20 years." MIT Energy Initiative exec. director Melanie Kenderdine, interviewed by CNBC on April 12, 2011.

"Alas, his analysis is based on extremely weak data, and also has a severe methodological flaw (plus some other questionable decisions), all of which means that his bottom line conclusions shouldn't carry weight." Michael A. Levi, David M. Rubenstein Senior Fellow for Energy and the Environment, Council on Foreign Relations, on CFR blog, April 15, 2011.

"Howarth's (and EPA's estimates of methane emission rates are based on very limited data. Relatively few actual observations were used to estimate "emissions factors," which were then extrapolated to estimate emissions from the system as a whole." Dan Lashof, Director, Climate Center, NRDC, on Staff blog, April 12, 2011.

"This paper is selective in its use of some very questionable data and too readily ignores or dismisses available data that would change its conclusions." David McCabe, Atmospheric Scientist, blog on Clean Air Task Force on April 13th, 2011.

Further Resources

[Energy In Depth: Cornell Critique](#)

[Global Warming Potential Values: IPCC Fourth Assessment Report](#)

[EPA 2011 U.S. Greenhouse Gas Inventory Report](#)

⁶ U.S. EPA, Climate Change, Methane, <http://www.epa.gov/outreach/> (last accessed April 20, 2011).

⁷ Howarth Presentation to Colleagues, March 15, 2011 http://www.youtube.com/watch?v=EHg6Ueb2t-E&feature=player_embedded (last accessed April 20, 2011).