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Notion that shale gas is worse for climate than coal collapses under scrutiny, experts say

By [Bryan Schutt](#)

A mass of evidence refutes the research from Cornell University professors who claim that shale gas makes a [poor bridge fuel](#) that crowds out renewables, energy experts and industry members said.

In the wake of the latest research from Cornell's Robert Howarth, Anthony Ingraffea and Renee Santoro, unconventional-gas proponents have rallied behind research papers and technical reports that they say have debunked Howarth's claims step by step.

Researchers with Carnegie Mellon, the University of Maryland, the Worldwatch Institute, the U.S. Department of Energy's National Energy Technology Laboratory, IHS CERA and the American Clean Skies Foundation, and even other Cornell researchers, have all picked apart Howarth's claims that shale gas is worse for the climate than coal and oil.

The criticism centers on three points: Howarth and his researchers overstated methane leakage from shale production; rejected the 100-year standard for determining the global warming potential for methane; and incorrectly compared fuels by heat rather than by electricity generation. Each wrong step leads to faulty data, observers say, but combining all three creates vastly distorted research.

"This is a blatant regurgitation of a flawed study and has no place in a fact-based discussion about important energy choices we must make as a nation," said Dan Whitten, vice president of strategic communications for America's Natural Gas Alliance.

Perhaps more seriously, some observers and other researchers see Howarth as [mingling advocacy with science](#), an assertion Howarth and Ingraffea staunchly denied. He has, however, admitted to receiving funding from the Park Foundation, a group that has funded anti-shale advocacy.

"It's well understood that Professor Howarth and his colleague Ingraffea want to ban shale gas," said energy consultant John Hanger, former head of the Pennsylvania Department of Environmental Protection. "There's a policy goal that they have when they make their choices about [research] assumptions. ... Most scientists who are focused just on the science and not the policy implications of their science wouldn't be attending rallies and demonstrations with buttons pushing a point of view."

Howarth and Ingraffea say they want to shift investments away from shale gas and toward green technologies. In their opinion, worldwide growth in shale gas crowds out investments in low- or no-carbon technologies. A new report from researchers at the Massachusetts Institute of Technology somewhat backs their stance.

According to the MIT report, shale gas could [stunt development](#) of costly, low-emissions energy sources. "While taking advantage of this gift in the short run, treating gas as a 'bridge' to a low-carbon future, it is crucial not to allow the greater ease of the near-term task to erode efforts to prepare a landing at the other end of the bridge," according to the researchers at MIT.

But many observers say there is overwhelming evidence that makes a mockery of any vision that sees renewables headed for a cliff. In fact, some of the largest oil and gas companies in the world have projected a growing role for green technologies.

In its 2012 outlook on energy, [Exxon Mobil Corp.](#) said use of renewable energy sources will grow significantly through 2040. Wind power is expected to rise at a rate of about 8% a year over the forecast, and the quantity of electricity generated by wind power "will grow more than tenfold through 2040," according to the [outlook](#). "By 2040, modern renewable fuels are expected to account for about 7 percent of global energy demand, compared to 3 percent in 2010."

[BP plc](#) sees a similarly prominent role for renewables and non-fossil energy sources. [BP expects](#) global renewable consumption to increase 8.2% a year through 2030. And at the end of that time frame, renewables will supply 11% of the world's electricity, [BP projects](#).

"There are some, and I think Professor Howarth is one, who are throwing whatever they can against natural gas and seeing what sticks," Hanger said. "This claim that somehow or another renewable energy is going to be devastated by gas just isn't borne out by what's happened since the shale gas boom has occurred. The shale gas boom has coincided with the renewable energy boom."

Methane leaks called overstated

While the controversy about global warming potential or comparisons in heat versus electricity may be a matter of opinion, many believe better data could cement, or blow apart, any conclusions. The initial Howarth study relied on shale production emissions [data](#) that has been called into question.

In recent [correspondence](#) with the EPA, ANGA and the American Exploration & Production Council said the agency's [proposed air emissions rulemaking](#) affecting the oil and natural gas sector vastly overstates the amount of gas that escapes during well completion, by perhaps 1,200%.

The EPA assumes that 9,175 Mscf, or 9.175 million standard cubic feet, of total gas is emitted per completion event. The EPA also assumes that flowback lasts three to 10 days, only about 15% of completions are controlled and 51% of gas is vented versus flared.

But a survey of data from eight companies encompassing nearly 1,500 wells showed that about 93% of wells had green completions. "Even among the 7% that were non-green completed, 54% of those were flared (rather than directly vented)," according to the correspondence. "This leaves approximately 3% of the well completions in the dataset that were uncontrolled. This is far lower than EPA's assumed value of 85% of the completions that are uncontrolled, with only 15% being green completed."

Although the data was from a limited number of companies, the groups said it was much more current than the figures the EPA relied on. Further, the groups asked the EPA to consider the implications of disseminating poor data.

"Continued dissemination and reliance upon older and less consistent information ... raises serious quality concerns wherever the data may be used," according to the submission. "The current EPA overestimate is frequently cited in studies and reports, leading to inaccurate conclusions about industry emissions and increasing the potential for federal or state governmental agencies to rely upon the inaccurate data in their decision making."

Concessions from Howarth

Mingled within the latest anti-shale gas research of Howarth et al., however, is an acknowledgement that data could be shifting. Because of new information from the EPA, the latest from the researchers said their initial emissions estimates at the time of well completions can be reduced by 15% to account for the estimated average percentage of gas that is not vented but is flared or captured.

Further, they said the EPA's proposed emissions regulations, which could reduce flowback methane emissions up to 95%, would make a drastic difference. "[T]his is a very important step, and if the regulation is adopted and can be adequately enforced, will reduce greatly the difference in emissions between shale gas and conventional gas in the U.S.," the [latest report](#) said. "We urge universal adoption of gas-capture policies."

Hanger said the concessions cannot be understated and they frame the impact of shale gas in an entirely different light.

"Assuming the EPA rule is in place, assuming you accept the [Intergovernmental Panel on Climate Change]'s global warming potential of 100 years, and assuming you measure emissions based on coal being burnt in the power plant and gas being burnt in the power plant, you end up with gas being very much cleaner than coal," he said. "Howarth's paper would collapse with those three assumptions in place."