

Natural gas's impact as a 'bridge fuel' has been oversold, report says

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Natural gas will not be a bridge fuel to a post-carbon future in the absence of an overarching climate change policy, according to a study published yesterday in the journal *Nature*.

That's because the fuel is likely to displace low-carbon renewable energy sources as well as coal from the energy mix, the [study](#) finds. So the net impact on global warming of using abundant supplies of natural gas would be rather small, said Haewon McJeon, a scientist at the Pacific Northwest National Laboratory and lead author of the paper.

"You have some reduction in emissions, but not by much," McJeon said.

The question is important given that the United States has become the biggest natural gas producer in the world. With the advent of new techniques like hydraulic fracturing and directional drilling, energy companies have unlocked vast new reserves in shale reservoirs. The Obama administration has supported the gas industry, even as low prices have prompted utilities to switch from coal to gas for electricity generation.

The switch is generally considered beneficial for the climate since gas emits only half as much carbon dioxide in the power plant as coal. Carbon emissions in the United States are already falling, and some observers have lauded the fuel's benefits over coal.

But the recent emissions reductions could be a red herring. The *Nature* study finds that abundant use of gas by nations would hardly make a dent in warming by 2050. In order for gas to be a "bridge fuel" to a future of solar, wind and other renewables, a comprehensive climate change policy needs to be in place, McJeon said.

"We cannot solely rely on abundant gas to solve the climate change problem," he said. "The climate change problem requires a climate change solution. Abundant gas could be great for any number of things, but it is not going to solve the climate change problem."

Models see gas delaying cleaner energy

The study comes out of the wonky "integrated assessment" community of modelers who use algorithms to create a complex virtual world of economics, energy markets and climate change. Scientists input scenarios they want to explore into the virtual reality, and the model spits out what the planet would look like in the future.

The field was pioneered by, among others, Yale University climate economist William Nordhaus, who rose to prominence in the 1980s by building integrated assessment models.

In the *Nature* study, McJeon and his colleagues used five different models and tested two different scenarios in each: a world with abundant supplies of natural gas and a world with constrained supplies of gas.

The models crunched the data and painted a picture of the 2050 world. Under abundant gas supply, prices would drop and people would use up to 170 percent more gas compared to a world with a constrained gas

supply. Economic activity would accelerate, and there would be few incentives for the world to develop low-carbon energy sources like solar and wind. And the world would emit a lot of carbon.

Enough, in fact, to roughly equal the carbon emissions in a world where natural gas is in short supply and the world continues to rely on coal for electricity generation.

So, irrespective of whether abundant or little gas is available, the world's climate ends up at roughly the same place.

"The study by McJeon and colleagues adds to the growing body of research that the increased use of gas does not lower greenhouse gas emissions, primarily because it delays the use of lower-carbon sources like renewable technologies, and discourages efficiency and conservation," said Christine Shearer, a researcher at the University of California, Irvine, who was not affiliated with the study.

Shearer and her colleague Steven Davis at the same university wrote in an accompanying commentary in *Nature* that the next step for scientists should be to model specific climate and energy policies and evaluate the impact on climate change. McJeon and his colleagues are working on this, and their work should be released in the coming months.