

No matter the drilling method, natural gas is a much-needed tool to battle global warming: study

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No matter how you drill it, using natural gas as an energy source is a smart move in the battle against global climate change and a good transition step on the road toward low-carbon energy from wind, solar and nuclear power.

That is the conclusion of a new study by Cornell Professor Lawrence M. Cathles, published in the most recent edition of the peer-reviewed journal *Geochemistry, Geophysics and Geosystems*. Cathles, a faculty member in Cornell's Department of Earth and Atmospheric Sciences, reviewed the most recent government and industry data on natural gas "leakage rates" during extraction, as well as recently developed [climate models](#).

He concluded that no matter the timeframe considered, substituting natural gas energy for all coal and some oil production provides about 40 percent of the global warming benefit that a complete switch to low-carbon sources would deliver.

"From a greenhouse point of view, it would be better to replace coal electrical facilities with [nuclear plants](#), wind farms and solar panels, but replacing them with natural gas stations will be faster, cheaper and achieve 40 percent of the low-carbon-fast benefit," Cathles writes in the study. "Gas is a natural transition fuel that could represent the biggest stabilization wedge available to us."

Cathles study, "Assessing the Greenhouse Impact of Natural Gas," includes additional findings about expanding the use of natural gas as an energy source, and the [climate impact](#) of "unconventional" [gas drilling](#) methods, including hydraulic fracturing in shale formations. They include:

-- Although a more rapid transition to natural gas from coal and some oil produces a greater overall benefit for climate change, the 40-percent of low-carbon energy benefit remains no matter how quickly the transition is made, and no matter the effect of ocean modulation or other climate regulating forces.

-- Although some critics of natural gas as a transition fuel have cited leakage rates as high as 8 percent or more of total production during drilling – particularly [hydraulic fracturing](#) extraction – more recent industry data and a critical examination of Environmental Protection Agency data supports leakage rates closer to 1.5 percent for both conventional and hydrofractured wells.

-- Even at higher leakage rates, using natural gas as a transition to low-carbon energy sources is still a better policy than "business as usual" with coal and oil, due to the different rates of decay (and hence long-term global warming effect) of CO₂ released in greater amounts by burning coal and oil and any methane released during natural gas extraction.

-- Using natural gas as a transition fuel supports the push to low-carbon sources by providing the "surge capacity" when needed, or a buffer when solar and wind production wanes.

"The most important message of the calculations reported here is that substituting natural gas for coal and oil is a significant way to reduce greenhouse forcing, regardless of how long the substitution takes," Cathles writes. "A faster transition to low-carbon energy sources would

decrease greenhouse warming further, but the substitution of [natural gas](#) for other fossil fuels is equally beneficial in percentage terms no matter how fast the transition."

Provided by Cornell University

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