Now largely moot discussion of the relationship between natural gas leakage and global warming

For reasons that this discussion is not as appropriate as it first appeared, see discussion [here](#).

If the leakage is less than 2%, the substitution of natural gas for coal (in electricity generation) and oil in transportation will reduce greenhouse warming by 40% of that which is possible if zero carbon energy sources (wind, solar, nuclear) were substituted instead. In this case gas substitution would constitute the biggest climate stabilization wedge available to us. If gas leakage is greater than 8% of production, its substitution would increase global warming. Most believe that gas leaks are between 1 and 2% of production, so shifting to natural gas is a very good deal from a climate (and environmental - no mercury etc.) perspective. This case is made in a few slides [here](#).

Other Cornellians have argued that the leakage is 8%. Our final reply in a discussion of these issues with them provides links to the original contention by Howarth et al. that natural gas could have twice the greenhouse footprint of coal, and all the subsequent discussion.

Selected reviews on papers addressing the 2% vs 8% venting issue are [here](#).

A 24 minute video prepared for a Technical Conference on Unconvertional Gas hosted by the City Hall of Vitoria, the Province of Alava, and the Basque Government addressing the impact of substituting natural gas for coal and some oil can be viewed [here](#). Answers to questions asked by the participants of that conference can be viewed [here](#). The material is an updated and evolved version of what is summarized above. A longer version of the video that has more discussion at the end can be viewed [here](#). The slides used in the presentation can be viewed [here](#).

The final unformatted version of a paper published by Geochemistry Geophysics Geosystems G3 titled "Assessing the greenhouse impact of natural gas" (vol. 13(6) 19 June 2012, doi:10.1029/2012GC004032) can be viewed [here](#). This paper makes the case that 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.

A useful GHG Calculator is offered [here](#). It calculates the grams of CO2-equivalent carbon produced by burning coal and natural gas, taking into account methane leakage. It then computes the comparative impact of generating electricity with these two fuels as a function of leakage rates, electrical conversion efficiency, and GWP. The method is exactly the same as used by Howarth, Ingraffea and Santorum in their 2011 paper which asserted that natural gas could have twice the warming impact as coal.