

Joseph Hardy  
Wells  
LD 2077

Dear Committee Members:

I am writing in support of LD 2077. At 79, I am a former chemist, college professor, high school chemistry teacher, and science consultant. I have continually kept up with climate science. This past year I wrote a weekly science based climate essay for local community leaders and others. I quote from the essay I titled, "Natural Gas as a Transition Fuel?"

"For the past ten or fifteen years natural gas has been touted as a fuel for transitioning from oil and coal to renewable forms of energy such as solar, wind, and geothermal. That idea hinges on the fact that natural gas, upon combustion, produces about 50% less carbon dioxide than coal, and approximately 20% less than oil and thus its use would, in theory, contribute significantly less to the enhanced greenhouse gas effect in the atmosphere.

One problem with this idea is that natural gas production allows methane to escape, i.e., leak into the atmosphere. The question we should ask is two-fold: (1) how much is escaping during drilling operations, whether by means of traditional drilling or via fracking, and (2) how much is escaping from wells which are abandoned or no longer operational? Answering this question is important because methane has a considerably higher GWP than carbon dioxide (in the short term, about 80 to 1). Thus only a small amount of escaped methane has a huge impact on whether natural gas is, in fact, a better fuel than coal or oil. As you might expect, the answer depends upon whom you ask, and what research can be trusted.

According to the EPA, leakage can occur in a myriad of ways: from production (including drilling, venting, and flaring), transportation (pipelines and trucks), and processing, right up to the point where the gas is delivered to a home, business, or power plant. Production of the gas accounts for about 60% of the leakage losses.

A 2014 study by the University of Texas found that only .42% of natural gas was lost to the atmosphere as methane, but it was a limited study of only 190 sites. A much larger EPA study in 2015 estimated methane losses to be 1.4% of all natural gas that was drilled and processed. The same year, a large study by the Environmental Defense Fund, employing scientists from several major universities, found a much greater loss of methane to the atmosphere: 2.3%

If this is correct, it is dangerously close to the 3-4% level of loss that many scientists believe would completely offset the greenhouse benefits of natural gas. (Natural gas is still an improvement in terms of ground level pollution)

A new Stanford University study of 26,000 wells in the Permian basin of New Mexico, during a 16 month period (2018-2020), employed new aerial technology. Surveying the atmosphere with "hyperspectral" cameras, researchers determined that losses of methane were a whopping 9%. This result was based on the fact that each greenhouse gas has a unique "optical footprint," allowing a determination of the methane concentration above each of the oil/gas fields studied. The increased use of hydraulic fracturing may well contribute to the elevated level that was found. The researchers discovered that 4% of sites surveyed accounted for half of all the leakage; some of these sites were characterized by massive plumes of methane.

So where does that leave us? Because methane concentrations are rapidly rising worldwide, fracking is employed more often, and the results of the Stanford study are worrisome, the EPA is now proposing substantial new rules designed to reduce methane losses--from current drilling operations and from abandoned wells. Nevertheless, all things considered, the data from multiple studies strongly suggest that the greenhouse gas benefits attributed to natural gas are much less than earlier predicted, and perhaps nonexistent."

I should mention also that upon combustion, natural gas releases nitrous oxide, which has a GWP of 273 (carbon dioxide is 1) and is extremely stable in the atmosphere,

with a 100 year lifetime. The concentrations of nitrous gas in homes, from gas stoves, have recently received attention in the press, and is the reason that several states (CA and Washington) and numerous cities have recently taken steps to prohibit or limit new gas hookups in construction.

The multiple contributions of natural gas to global warming concern me greatly, and suggest that any efforts to extend the use of this fuel in Maine communities are not in the public interest. Once the infrastructure is in place, we will be locked into dangerous greenhouse gas emissions for another 20-30 years, jeopardizing our climate goals.

Respectfully,  
Joseph W. Hardy