



EPA seriously overstates well emissions *Incorrect estimates have critical policy implications*

EPA's 2011 recalculation of methane, volatile organic compound (VOC) and hazardous air pollutant (HAP) emission estimates from natural gas wells are overstated by orders of magnitude and are undermining other research work and policy consideration.

Background

In 2010, EPA issued a background technical support document titled, "Greenhouse gas emissions reporting from the petroleum and natural gas industry." In the report, EPA altered the methodology it had previously used to estimate methane emissions from natural gas production.

Before 2010, EPA estimated 0.02 metric tons of methane were emitted per well completion. In 2010, EPA made dramatic changes to its estimates. The new estimates hold that conventional natural gas wells emit 0.71 metric tons of methane, and shale gas wells emit 177 metric tons of methane per well completion. As a result of these new estimates, EPA adjusted prior-year U.S. greenhouse gas emission reports retroactively as far back as 1990 to reflect the new estimates.

Problem

A report exploring the inaccuracies in EPA's methodology in determining methane emissions from natural gas production was released in August 2011. IHS CERA, a highly respected research firm with specific expertise in the oil and natural gas production sector, released a report titled, "Mismeasuring Methane: Estimating greenhouse gas emissions from upstream natural gas development." In the analysis, IHS CERA points out specific flaws EPA made in its analysis, including:

- The misuse and inaccurate application of Natural Gas STAR program data collected from a small number of wells to assume industry-wide emission rates – based on the erroneous assumption that methane reported as captured through "green completions" would otherwise be vented to the atmosphere when a green completion is not performed.
- EPA's flawed rounding of data points to the nearest hundredth, thousandth, and even ten thousandth Mcf to overcome the "high variability and uncertainty" in the industry – masking a lack of consistent and reliable data that would undermine the EPA conclusions.
- Developing an assumption that producers in Texas, New Mexico and Oklahoma vent to the atmosphere during flowback, rather than commonly flaring or capturing emissions, simply because those states do not mandate flaring or recovery.

As a follow-on to the IHS-CERA study, Devon conducted its own investigation that revealed that EPA emission estimates were 1400 percent greater than Devon's actual emissions. Subsequently, URS Corporation conducted a survey that revealed EPA emission estimates as much as 1200 percent greater than emissions of the seven companies that participated in the study.

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The work by URS Corporation in November 2011 involved gathering and analyzing U.S. well data completed in more than 10 different basins across the country. Using an EPA-endorsed flow equation with assumptions that provide high estimates, URS found that methane emissions among the seven companies represent less than eight percent of the EPA estimates. This means actual production-related emissions of associated volatile organic compounds and hazardous air pollutants in the gas stream are also less than eight percent of what the EPA believes.

EPA's faulty estimates have led researchers, financial analysts and other governmental bodies to rely on inaccurate statistics in a number of research reports and in policy consideration. For example, Dr. Robert Howarth of Cornell University led a team that released a study this past spring questioning whether natural gas is truly a cleaner fuel than coal. Certainly Dr. Howarth's study included several inaccurate assumptions of his own making, but a key basis for his review lies in the overestimation of methane emissions developed by EPA.

The Cornell study and EPA's methane emission estimates are also finding voice in other government studies. The U.S. Department of Energy SEAB Natural Gas Subcommittee report even mentions the "pessimistic conclusion about the greenhouse gas footprint of shale gas production and use."

Perhaps most important, critical policy initiatives and discussions are being based on EPA's flawed estimates. Currently the proposed new source performance standards for the oil and natural gas industry are founded in part on what are now seen to be seriously inflated estimates of VOCs, HAPs and methane emissions as calculated by EPA. In addition, those concerned about broad global climate change policy see the revised EPA methane emission numbers as calling into question the clean advantage of natural gas.

Finally, the EPA emission estimates fly in the face of sound business and economic principles. Producers have every incentive to capture as much valuable methane as possible, as early as possible, in the well completion and production process. That is a key driver in the use of advanced early production processes (AEPP) that ensure early methane capture, even during initial well flowback (with the environmental benefits leading to the term "green completions"). This is important because if EPA's estimates were true, Devon would have lost more than \$305 million to the atmosphere in a single year. No business would tolerate this type of waste.

Solution

To prevent further unintended consequences by use of seriously flawed EPA emission estimates, EPA should return to its time-tested methodology and previous estimates.