

## Frequently Asked Questions

### EDF Pennsylvania Oil & Gas Emissions Data Project

#### What are the main findings of the analysis?

Environmental Defense Fund estimates Pennsylvania's oil and gas companies emit more than 522,000 tons of methane a year – five times more than what oil and gas companies report to the state.

These emissions are estimated to cause the same near-term climate damage as 11 coal-fired power plants, and result in \$68 million of lost gas a year.

#### How did EDF conduct this analysis?

EDF's analysis is based on a 2016 study by a team from Carnegie Mellon University, published in [Environmental Science and Technology](#), where researchers spent three months measuring methane at well sites in the Marcellus Shale -- detecting methane at levels 7 to 8 times higher than what oil and gas companies report to the state. Mark Omara led that study as a post-doctoral fellow at Carnegie Mellon before joining Environmental Defense Fund as a senior research analyst. Our analysis supports the findings of [dozens of other independent, peer-reviewed studies](#), which find that official methane inventories generally underestimate emissions from the oil and gas sector. The complete [methodology](#) for this analysis is available for review.

#### Why are EDF's methane estimates higher than what is reported to the state?

EDF estimated statewide emissions based on scientific research conducted at Pennsylvania well sites. The state's emissions data is based on information submitted to the state by the oil and gas companies themselves. State data is not considered comprehensive because it does not include emissions from "conventional" wells; and because the companies that report generally use formulas for estimating emissions, not actual measurements. These formulas, which calculate emissions by multiplying activity data (e.g. number of pneumatic controllers) by emission factors (e.g. average emissions per pneumatic controller), often underestimate emissions, especially from malfunctioning equipment and other abnormal conditions that can cause high, variable but voidable emissions.

#### What do we know about emissions from malfunctioning equipment?

A number of recent scientific studies – [including a study of Barnett Shale well pads](#) – have found that emissions from abnormal conditions such as malfunctioning equipment are responsible for a significant portion of industry's total methane emissions, but are often excluded from official emission inventories. [One of largest methane studies to date](#), which surveyed over 8,000 well pads nationwide including 2,000 in Pennsylvania, found these emissions are random, unpredictable and ubiquitous. Researchers suggest regularly checking oil and gas sites for malfunctioning equipment and focusing on better site design are cost-effective ways to reduce pollution from these facilities.

### **What is the difference between conventional and unconventional wells?**

Conventional wells are older wells that use more traditional extraction methods and account for approximately 90% of Pennsylvania's wells. Most newer natural gas wells are classified as "unconventional wells" – those that typically require newer horizontal drilling techniques and high-volume hydraulic fracturing. Unconventional wells make up approximately 10% of the state's wells. Based on [previously published, empirical measurement data](#), EDF's analysis found that conventional wells emit approximately 23% of their gas production. Unconventional wells have a lower loss rate (0.27%), but because they produce such a high-volume of gas, they emit higher emissions per site in absolute terms.

### **How can Pennsylvania reduce these emissions?**

The Department of Environmental Protection is in the process of finalizing new permit requirements for new and modified unconventional wells that EDF estimates can achieve a 3% reduction in the state's total oil and gas methane emissions.

The governor has also announced plans to reduce emissions from existing unconventional wells. Once fully implemented, these standards could eliminate an estimated 25% of Pennsylvania's methane pollution.

The analysis estimates Pennsylvania could eliminate up to 60% of emissions if additional standards are implemented to control pollution from both unconventional and conventional wells.

### **Will federal standards have an impact on Pennsylvania's methane emissions?**

In 2016, the U.S. Environmental Protection Agency implemented standards to reduce emissions from all new and modified well sites. These actions – if fully implemented -- are projected to reduce the state's oil and gas methane emissions by 8%. However, the Trump administration has proposed eliminating or weakening these standards.

Even with these federal standards in place, Pennsylvania's oil and gas companies are estimated to emit more than five million tons of methane into the atmosphere by 2025.