

Methane and Health-Damaging Air Pollutants from the Oil and Gas Sector: Bridging 10 Years of Scientific Understanding

Over the last five years, researchers have provided unequivocal evidence that swift and aggressive reductions in methane emissions are needed to avoid the worst effects of climate change. While methane itself is not harmful to human health, a review of the last ten years of research reveals that methane is nearly always emitted alongside other chemicals that do.

Exposure to some of the health-damaging air pollutants found in oil and gas emissions, even in small amounts, can cause premature birth, asthma, cancer, and other adverse health impacts. Science also shows this risk is higher the closer emissions occur to human populations.

Key Findings

- I. Oil and gas sources of methane emissions are nearly always sources of health-damaging air pollutants (HDAPs). However, not all sources of HDAPs are sources of methane.
- II. Super-emitters of both methane and HDAPs are present in every sector of the oil and gas supply chain, providing clear evidence that substantial emissions reductions are possible.
- III. Efforts to reduce fugitive emissions (i.e., venting and leaks) throughout the oil and gas supply chain will result in the co-reduction of emissions of both methane and certain HDAPs.
- IV. Over the past decade, the scientific understanding of oil and gas emissions has increased substantially.
- V. There is now unequivocal evidence to support swift and aggressive actions to avoid shorter-term global warming and reduce public health harm.

WHAT IS METHANE?

As a potent greenhouse gas, methane has a warming potential of more than 80 times that of CO₂ over a 20 year period. Methane can also impact public health through the formation of ground-level ozone.

WHAT ARE HDAPs?

Health-Damaging Air Pollutants are particulates and gaseous, volatile, or semi-volatile compounds that are hazardous to human health. There is clear evidence that the closer HDAP emissions sources are to human populations, the greater the public health risk.

Recommendations



- I. To increase public health benefits, prioritize oil and gas emissions reductions near population centers.
- II. A comprehensive approach to reducing methane and HDAP emissions should include installing maximum achievable equipment controls, conducting routine preventative maintenance, and integrating new monitoring technologies to improve upon existing operational and maintenance practices such as leak detection and repair programs.
- III. While additional research gaps remain, calls for additional research should not be used as a barrier for taking immediate action through emission controls and monitoring systems to further reduce oil and gas emissions.
- IV. The transition away from oil and gas must be managed in a way that does not result in degraded operation and maintenance practices and potentially increased emissions.

Policy Implications

While the location of methane emissions does not change their climate impact, the body of scientific evidence indicates that proximity to health-damaging air pollutants increases public health risk.

Given the powerful shorter-term global warming potential of methane and the fact that it is nearly always emitted alongside health-damaging air pollutants, swift and aggressive mitigation strategies should be deployed. Addressing high-emissions sources (i.e., super-emitters) and sources near population centers offers the greatest opportunity to protect both public health and climate.

Given the significant advancement in scientific understanding of these issues over the last five years, the prospect of future research should not preempt swift emission control and air quality monitoring solutions of oil and gas systems, in particular those located near human populations.

Background and Methods

This fact sheet summarizes the findings and recommendations from PSE Healthy Energy's literature review examining the last ten years of research on methane and health-damaging air pollutants from the oil and gas industries.

The review includes peer-reviewed literature that was a) published between January 2015 and August 2020 and b) examined primary data collection efforts of methane and health-damaging air pollutant emissions throughout the oil and gas supply chain.

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