COMMENTS OF THE CENTER FOR CLIMATE AND ENERGY SOLUTIONS

This document constitutes the comments of the Center for Climate and Energy Solutions (C2ES) on EPA's Proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review (Docket No. EPA-HQ-OAR-2021-0317).

C2ES is an independent, nonprofit, nonpartisan organization dedicated to advancing strong policy and action to reduce greenhouse gas emissions, promote clean energy, and strengthen resilience to climate impacts. Through the Climate Innovation 2050 Initiative, C2ES has worked closely with more than four dozen leading companies to examine the decarbonization challenges facing the United States and develop pathways toward decarbonization, including through developing *Getting to Zero: A U.S. Climate Agenda*, a comprehensive policy agenda to decarbonize the U.S. economy by 2050.

The views expressed here are those of C2ES alone and do not necessarily reflect the views of members of the C2ES Business Environmental Leadership Council (BELC).

Background

Natural gas and petroleum systems in the United States represent the largest industrial source of methane emissions, the second biggest driver of climate change.[1] Along the oil and natural gas value chains, methane can leak unintentionally. It also can be intentionally released or vented to the atmosphere to reduce pressure at the wellhead or for other safety-related considerations. However, methane emissions from leaks and routine venting and flaring along the oil and natural gas value chains (e.g., production, processing, transmission, and storage operations) should be minimized to slow the rate of climate change.

In 2016, the U.S. Environmental Protection Agency (EPA) issued the first rule targeting methane emissions from oil and natural gas operations. These New Resource Performance Standards required operators of new oil and natural gas wells to find and repair leaks and capture natural gas from the completion of hydraulically fractured oil and natural gas wells. Although EPA set previous standards in 2012 for volatile organic compounds (VOCs) from new hydraulically fractured and re-fractured natural gas wells that resulted in reduction in methane sources from these sources, there was still a need for standards that specifically target methane emissions. For example, in the case of dry natural gas wells that are regulated by VOC standards, there is not much methane to take out of the process compared to wet gas wells (i.e., regulating VOCs in dry natural gas wells doesn't necessarily mean reducing methane emissions). When it issued the rule in 2016, EPA estimated it could prevent 510,000 tons of methane emissions by 2025 (equivalent to 11 million tons of carbon dioxide) in addition to reducing other harmful air pollutants.

During the last few years, the body of scientific evidence demonstrating harmful consequences of methane emissions has only grown and strengthened.[2] The better understanding we have now about the sources of methane emissions makes reducing methane emissions a cost-effective and relatively quick pathway to limit increase in global temperature. Also, the recently launched Global Methane Pledge by the United States and more than 100 other countries to reduce methane emissions by at least 30 percent from 2020 levels by 2030 makes regulating methane emissions from existing and new sources an essential tool to reach that goal.[3]

C2ES is pleased to have the opportunity to offer more specific comments on several of the main areas EPA identified.

Finding and repairing leaks (fugitive emissions)

Methane leak detection technologies have been evolving at unprecedented rates in the last few years. While leak detection is currently based on EPA's Method 21 for most cases or optical gas imaging (OGI) for certain equipment, there are alternative new technologies that can provide better detection and more accurate quantification of methane leakage. These innovative technologies include:

(1) laser absorption spectroscopy (LAS), which utilizes wavelength-dependent absorption of laser to quantify the concentration of methane with high sensitivity,
(2) gas cloud imaging (GCI), which utilizes proprietary hyperspectral imaging technology to capture both visible and infrared video and provide real time monitoring, and
(3) video imaging spectral radiometry (VISR), which uses infrared images to measure how efficiently a flare consumes emissions.

These technologies offer a great opportunity for aerial detection of methane emissions compared to the conventional, limited terrestrial technologies. Aerial survey and detection would allow operators to cover larger surface area, detect leaks rapidly, and benefit from accurate localization and quantification of methane emissions.

EPA should allow regulated facilities (i.e., well sites and/or compressor stations) to use different innovative technologies to identify leaks as long as they are evaluated against strict performance-based criteria (e.g., meet detection limit threshold and reliability standards under different weather conditions) rather than strictly limiting their ability to use new technologies. This technology-neutral approach would encourage operators of these facilities to continuously innovate and find better solutions for emissions reduction. Also, this will tie the interests of regulated facilities' owners and operators to better environmental performance.

The ultimate objective of any leak detection and repair system is to reduce emissions. This is usually done by first, detecting leaks above a certain threshold within specific distance and time ranges from the sources; then, quantifying the fugitive emissions rate to start the emissions reduction plan. There are different performance criteria that can be used to evaluate the effectiveness of new technologies to detect leaks and achieve compliance with EPA rules. These criteria include sensitivity (e.g., ppm or %), interference (i.e., specificity to methane), temporal resolution, environmental limitations (e.g., humidity, wind, temperature, etc.), and technology readiness level.

Eliminating Venting of Associated Gas from Oil Wells

C2ES is proposing the definition of an oil well associated gas affected facility as an oil well that produces associated gas as a by-product – from oil production operations – that is not routed to a sales line.

The main challenges for capturing associated gas that would otherwise be flared or vented are fixable at both technical and commercial levels. These challenges include lack of pipeline capacity for natural gas, lack of gathering and processing capacity, relatively high cost of transport and processing development, and temporary outage of natural gas infrastructure.[4]

Improving the existing pipelines capacity would allow owners and operators to capture more associated gas instead of flaring it. Alternatively, gas can be compressed and trucked to a gas processing plant or another location where it can be used as a fuel in the absence of nearby pipelines. Also, gas can be utilized for local power generation by converting the gas to electric power using small-scale generators (gas-to-power). EPA can require project developers to define gas utilization plans prior to developing new fields. While the cost associated with transport and processing infrastructure development might be high for some owners and operators, there is an opportunity for clustering flare developments to bring the overall cost down by enabling economies of scale. These flare clusters can be co-developed in a way that allow operators to share both risks and resources as they connect their associated gas to existing or new pipelines.

Evaluating Additional Sources of Pollution

Abandoned and unplugged wells

In 2019, EPA estimated that methane emissions from abandoned oil and gas wells are 6.6 MMT CO_2e.[5] Fifty-nine percent of these abandoned oil and gas wells are unplugged (almost 2 million wells) which makes them more likely to pose greater health and environmental risks. While different states allocate funds dedicated to plugging abandoned wells and restoring well sites, the scale of the challenge is beyond their capabilities.[6] The funding for legacy pollution clean-up included in the recently enacted Infrastructure Investment and Jobs Act, which includes establishing new state programs for orphaned wells plugging and remediation, should give EPA an opportunity to help states address methane emissions from abandoned wells.[7] However, EPA needs to establish strict criteria that states must demonstrate to be granted this funding. These criteria should include proximity of abandoned wells to frontline communities and ensuring that funding is provided to orphaned wells (i.e., no operator or owner is known).

Poor performance and malfunction of flares

If flaring cannot be avoided, operators need to maintain efficient flaring operations to minimize methane emissions. In the case of flares that combust large volumes of gas, they are often designed with air- or steam-assisted devices that can be optimized to achieve near complete (>98%) combustion. This optimization requires increasing the flow of air or steam into the combustion zone of the flare to provide extra oxygen and reduce smoke formation.[8] Although maintaining the efficiency of flare combustion might be challenging if the waste gases have relatively low heating value, monitored and skilled operation can achieve optimum rates that maximize combustion and minimize smoke. EPA should require operators to conduct regular trainings on flare combustion efficiency. In the case of flares that handle small volumes of gas, they are often equipped with a pilot light that is used to maintain ignition of the flare flame. Most of the pilot lights currently used (e.g., thermocouples) suffer from weather-dependent malfunctions and intermittency problems. EPA should require operators to use technologies that can help maintain the combustion of the flare and also provide a back-up ignition in case of failure of a pilot light.[9]

Methane intensity performance standards

Building on the success of the EPA's Greenhouse Gas Reporting Program, EPA should consider taking these efforts a step further by establishing methane intensity performance standards for natural gas facilities that exceed the emissions reporting threshold. There is a growing movement towards establishing methane intensity targets and performance standards from both oil and gas companies (e.g., the 2025 methane intensity target of the Oil and Gas Climate Initiative (OGCI)) and governments (e.g., the EU is exploring binding methane performance standards on all gas sold on the EU market).[10] Methane intensity standards would help the United States reach its emissions reduction targets and enable U.S. gas and liquified natural gas (LNG) to compete in global markets with ambitious decarbonization targets.

Establishing Existing Source Standards in State Plans

One of the most important elements of the EPA's proposed standards is establishing the first-of-their-kind Emissions Guidelines for states to reduce methane emissions from existing oil and natural gas facilities.

Almost 86 percent of the projected emissions reductions and more than 83 percent of the projected climate benefits under the proposed rule are associated with regulating existing sources.[11] While some states have their own regulations for methane, these regulations vary widely in terms of emissions limits, testing frequency, and flexibility to use new leak detection and repair technologies. That is why it is extremely important to update state plans so that they align with the proposed Emissions Guidelines.

There are different ways that can enable existing state programs to be adopted into state plans under the Emissions Guidelines. For state programs that include less frequent leak detection and monitoring surveys, EPA can require these states to specify an emissions limit beyond which operators would need to perform more frequent leak tests. Also, state programs can be updated to include a timeframe for fixing any detected leaks that should not exceed the period defined in the proposed Emissions Guidelines. EPA should also allow states to include a different form of numerical standard for existing sources, as long as they can demonstrate they are as stringent as the final Emissions Guidelines.

Endnotes

[1] U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2019* (Washington, DC: U.S. Environmental Protection Agency, 2021), https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.

[2] A. R. Ravishankara et al., *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions* (Nairobi: Climate and Clean Air Coalition and United Nations Environment Programme, 2021), https://www.ccacoalition.org/en/resources/global-methane-assessment-full-report.

[3] "Joint US-EU Press Release on the Global Methane Pledge," The White House, last modified September 18, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/18/joint-us-eu-press-release-on-the-global-methane-pledge.

[4] Federal Reserve Bank of Dallas, *Dallas Fed Energy Survey, Fourth Quarter 2019* (Dallas, TX: Federal Reserve Bank of Dallas, 2019), https://www.dallasfed.org/-/media/Documents/research/surveys/des/2019/1904/des1904.pdf.

[5] U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2019*.

[6] Interstate Oil and Gas Compact Commission, *Idle and Orphan Oil and Gas Wells: State and Provincial Regulatory Strategies* (Oklahoma City, OK: Interstate Oil and Gas Compact Commission, 2019).

[7] Infrastructure Investment and Jobs Act, H.R. 3684, 117th Congress, (2021), https://www.congress.gov/bill/117th-congress/house-bill/3684.

[8] Vincent M. Torres, Scott Herndon, and David T. Allen, "Industrial Flare Performance at Low Flow Conditions. 2. Steam- and Air-Assisted Flares," *Industrial & Engineering Chemistry Research* 51 (2012): 12569–12576, https://pubs.acs.org/doi/abs/10.1021/ie202675f.

[9] U.S. Environmental Protection Agency, *Partner Reported Opportunities (PROs) for Reducing Methane Emissions: Install Electronic Flare Ignition Devices,* PRO Fact Sheet No. 903 (Washington, DC: U.S. Environmental Protection Agency, 2011), https://www.epa.gov/sites/default/files/2016-06/documents/installelectronicflareignitiondevices.pdf.

[10] Oil and Gas Climate Initiative, *OGCI's 2025 Methane Intensity Target*, (Oklahoma City, OK: Interstate Oil and Gas Compact Commission, 2020), https://www.ogci.com/wp-content/uploads/2020/06/OGCI_Methane-emissions_180320_A4.pdf; See also European Parliament, *REPORT on an EU strategy to reduce methane emissions*, 2021/2006(INI), (Brussels: European Parliament, 2021), https://www.europarl.europa.eu/doceo/document/A-9-2021-0277_EN.pdf.

[11] U.S. Environmental Protection Agency, *Regulatory Impact Analysis for the Proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review*, (Washington, DC: U.S. Environmental Protection Agency, 2021), https://www.epa.gov/system/files/documents/2021-11/proposal-ria-oil-and-gas-nsps-eg-climate-review_0.pdf.