



Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities in California

Government: California, United States of America

Region: North America

Sector(s): Short-lived climate pollutants (SLCP)

Date of publication: August 2019

Summary

In 2016, California’s oil and gas production, processing, and storage sector emitted about 3.3 million metric tons of methane — the main component of natural gas and a potent climate pollutant - using a 20-year Global Warming Potential. The Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, or the Oil and Gas Methane Regulation, was designed to reduce methane emissions from this sector and is anticipated to result in over 1.4 million metric tons of methane emission reductions per year when fully implemented in 2021, which is more than a 40% reduction from 2016 levels.

Regulated entities are required to take action to limit intentional (vented) and unintentional (leaked or fugitive) emissions from equipment and operations. The main provisions of the regulation are -

- Collection and use (or destruction) of methane and associated gases from uncontrolled oil and water separators and storage tanks with emissions above a set methane standard.
- Leak Detection and Repair (LDAR) requirements for components, such as valves, flanges, and connectors, currently not covered by local air district rules.
- Methane emission standards for reciprocating and centrifugal compressors, in addition to LDAR.
- Use of “no bleed” pneumatic pumps and “no bleed” pneumatic devices, with limited exemptions, and restrictions on intermittent bleed pneumatic devices.
- Ambient and wellhead monitoring requirements for underground natural gas storage facilities in addition to the LDAR requirements.

These regulations will be instrumental in achieving methane emission reductions for the state. The California Air Resources Board (CARB) is leading the way to curb climate change emissions in the region and the Oil and Gas Methane Regulation reinforces the importance of a strong institutional mechanism to tackle harmful effects of climate change.



Results and Accomplishments

- **Cost of regulation:** Overall estimated annualized cost, with natural gas savings, of \$27,300,000.
- **Emissions reduction:** Estimated continuing reductions of more than 1.4 million MT of CO₂ equivalent per year, using a 20-year Global Warming Potential for methane.
- **Cost efficiency:** Estimated overall cost-effectiveness of \$19 per MT of CO₂ equivalent reduced.
- **Reduction in VOC:** Over 3,600 tons per year (TPY) of volatile organic compound (VOC) reductions state-wide.
- **Reduction in toxic air contaminants:** Over 100 TPY of toxic air contaminant reductions state-wide, including benzene, toluene, ethyl-benzene, and xylenes.

Enabling conditions

- CARB is the primary state agency responsible for actions to protect public health from the harmful effects of air pollution.
- The Global Warming Solutions Act of 2006 expanded CARB's role to the development and oversight of California's main greenhouse gas reduction programs. These include Cap-and-Trade, the Low Carbon Fuel Standard, and the Advanced Clean Cars programs.
- In 2016, California Senate Bill 1383 was enacted, which called for a 40% reduction in methane from 2013 levels by 2030.
- The Oil and Gas Methane Regulation was adopted by the Board in March 2017. The regulation's provisions went into effect on 1 January 2018.
- California conducted a survey of the industry to get a good hand on the starting GHG inventory of the sector before beginning the regulatory process. Without such data it would have been challenging to estimate potential reductions and costs, as well as what sub-sectors to focus on in a regulation.

Challenges

- While challenging, including standards for a number of different types of equipment, such as separators and tanks, compressors, pneumatics, and LDAR, in a single regulation streamlined the regulatory process, and it can now be used as a model for other jurisdictions.
- It was a challenge to develop and adopt a regulation that affects both the oil and gas production and natural gas utilities sectors but addressing similar emission sources from both sectors in one regulation was more efficient and resulted in a comprehensive regulation.

Key lessons learned

State air quality regulations could be instrumental in protecting public health and addressing climate change.

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This case study was developed as part of the “Reducing Short-lived Climate Pollutants in States & Regions” project. The aim of this project is to support Under2 Coalition members to reduce methane emissions from oil and gas operations within their jurisdictions and showcase their achievements to other governments.