



Canada's Methane Regulations for Oil & Gas Sectors

OIL & GAS SUBCOMMITTEE MEETING



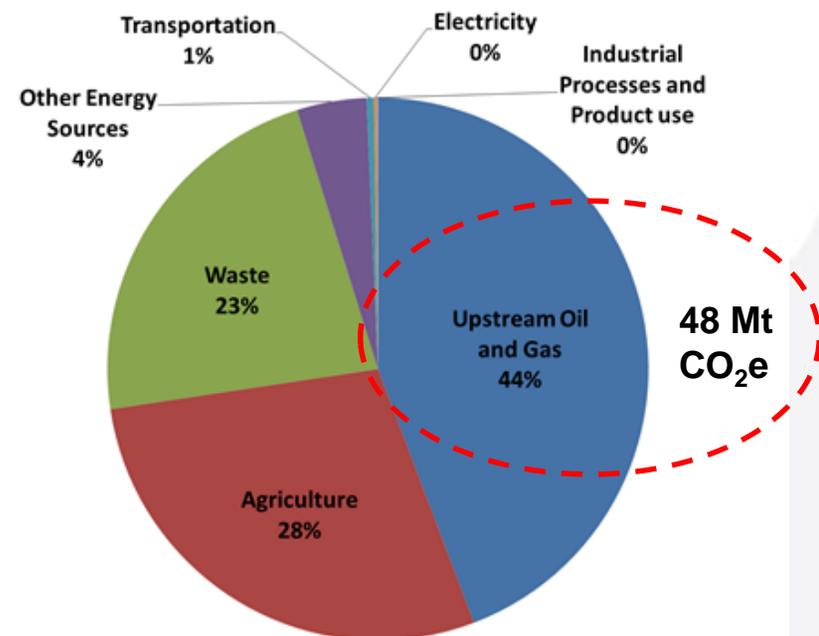
*Methane from a storage tank
« seen » with an infrared camera*



Where is Methane Emitted?

- Oil and gas facilities account for 26% of Canada's total GHG emissions and are Canada's **largest industrial emitters** of methane.
- The majority of these emissions are released by **fugitive** (unintentional release) and **venting** (intentional release) sources.

Canada's 2012
Total Methane Emissions
(110 Mt CO₂e)



Source: 2017 NIR

Upstream Oil & Gas Sector in Canada

- Canada is the **5th-largest producer of natural gas** and the **6th-largest producer of crude oil** in the world.
- Most upstream oil and gas facilities are found in **AB, BC** and **SK**.
- These facilities operate at **various scales and sizes**, from very small facilities (single well) to major facilities with multiple wells and equipment.
- They carry out a **variety of operations**: production, processing and transmission (pipelines)



Key Methane Sources in Oil & Gas Sector

1. Fugitive Emission Sources (34%)

- **Leaks** arising from inadequate maintenance or regular wear and tear of equipment (e.g. valves, flanges, connectors)



Leak from a wellhead



Intentional venting from storage tank

2. Venting Emission Sources (52%)

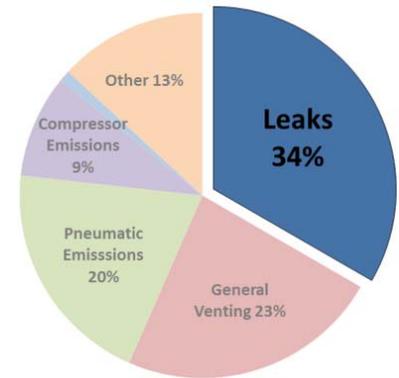
- **General facility venting** from wells, equipment and tanks
- Regular **compressor** venting, which can increase as internal components wear and age
- Venting of natural gas from **pneumatic** controllers and pumps
- **Well completions** involving hydraulic fracturing: if the gas in the flowback is directly vented

Methane Regulations – Design

- The Regulations require onshore and offshore oil and gas facilities to comply with operating and maintenance standards:
 - **Standard for fugitive emissions (leaks):**
 - Implementation of a **Leak Detection and Repair Program** to inspect and repair leaks (using traditional or alternative methods)
 - **Standards for venting emissions:**
 - **Site limit** for intentional venting (excludes emergencies, blowdowns)
 - **Specific limits** for compressors and pneumatic devices
 - **Green Completions** for well completion with hydraulic fracturing

Fugitive Emissions: Equipment Leaks Reduced through LDAR Requirement

- Leak detection and repair program (LDAR) targeting gas leaks
- 3.3 Mt or 20% of total emission reductions



Sector Emissions

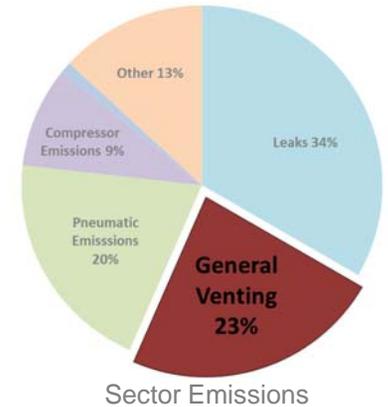
Element	Approach
Coming into force	2020
Coverage	Larger facilities (facilities producing/receiving at least 60,000 m ³ of hydrocarbon gas in a year)
Program options	1. Traditional program (i.e. infrared cameras / sniffers), 3 x per year 2. Alternative program that achieves equivalent outcome (i.e. drones, satellites, ground-based sensors, etc.)
Timelines for repair	Within 30 days, or next shutdown; additional repair time for highly specialized components/circumstances
Exemptions	Single wellheads, unsafe to access, isolation valves on transmission pipelines



Leak from a wellhead only visible with an infrared camera

Facility Venting: Control by Setting a Maximum Allowable Venting Limit

- Reduce vented emissions from facility production
- 6.4 Mt or 39% of total emission reductions



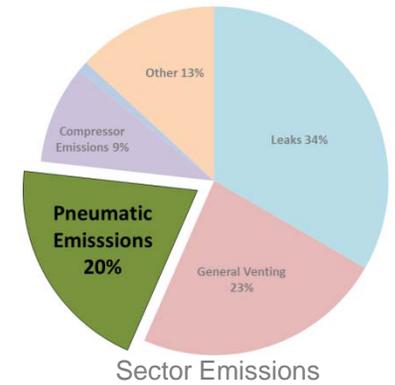
Element	Approach
Coming into force	2023
Coverage	Larger facilities: 1. producing/receiving at least 60,000 m ³ of hydrocarbon gas in a year, and 2. where more than 40,000 m ³ /year of this gas is sold, vented or destroyed (not used on site)
Maximum allowable venting limit	15,000 m ³ /year (1,250 m ³ /month)
Added Rigor	1. Protocol for estimating or measuring the gas produced on site, resulting in increased number of facilities covered 2. Requirement to show that fuel gas is combusted efficiently
Exemptions	Emergency venting and non-routine venting (e.g. blowdowns, shutdowns)
Reduction method	Facilities can choose how to achieve the limit. Some actions could include conservation of gas for use on site or for sale, or destruction.



Intentional venting from storage tank

Venting from Pneumatic Devices: Reduced by Requiring a Performance Limit for Device

- Meet emissions limit or switch to non-emitting device
- 5.6 Mt or 27% of total emission reductions



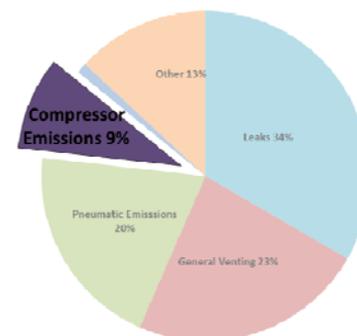
Element	Approach
Coming into Force	2023
Coverage	Larger facilities (facilities producing/receiving at least 60,000 m ³ of hydrocarbon gas in a year)
Requirements	Controllers: all controllers must meet rigorous low limit (0.17 m ³ /hour standard) Pumps: must not function using hydrocarbon gas for larger pumping rates (> 20L/day in a month)
Exemptions	Controllers: exemptions possible for operational needs, including emergency shut down for pipelines Pumps: exemption permits if no feasible non-emitting technology
Reduction method	Facilities can choose how to achieve the limit. Some actions include conservation of gas for re-use on site or for sale or destruction or replacement of the device with a low-bleed device.



Pneumatic controller

Venting from Compressors: Reduced emissions by Setting Performance Limits for Compressors

- Meet limit / repair equipment
- 0.9 Mt or 4% of total emission reductions



Sector Emissions

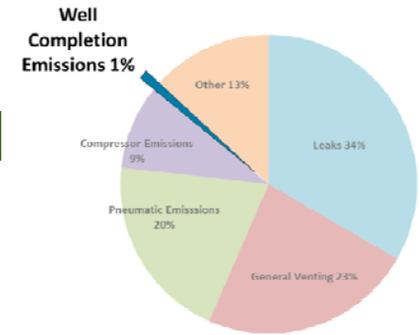
Element	Approach
Coming into force	<ul style="list-style-type: none"> • 2020 for existing compressors • 2023 for new compressors
Coverage	All facilities
Limits based on compressor type, size and age	<ul style="list-style-type: none"> • Existing large (>5MW) centrifugal compressors: 0.68 m³/min • Existing centrifugal compressors <5MW: 0.34 m³/min • New centrifugal compressors: 0.14 m³/min • Existing reciprocating compressors: 0.023 m³/min; • New reciprocating compressors: 0.001m³/min
Corrective action timelines	90 days
Measurement	Annual measurement or continuous monitoring with alarms
Exemption	<ul style="list-style-type: none"> • No measurement required if emissions are conserved or destroyed • Very small (<75 kW) and low use (<5% of time) compressors
Reduction method	<ul style="list-style-type: none"> • Facilities can choose how to achieve the limit. Some actions could include conservation of gas for re-use on site or for sale or destruction or on-going maintenance of the compressor.



Compressor

Venting from Well Completions involving Hydraulic Fracturing: Reduced Venting by Prohibiting Venting

- Prohibition on venting associated with flowback at facilities during fracturing operations at oil & gas wells
- 0.3 Mt or 1% of total emission reductions



Sector Emissions

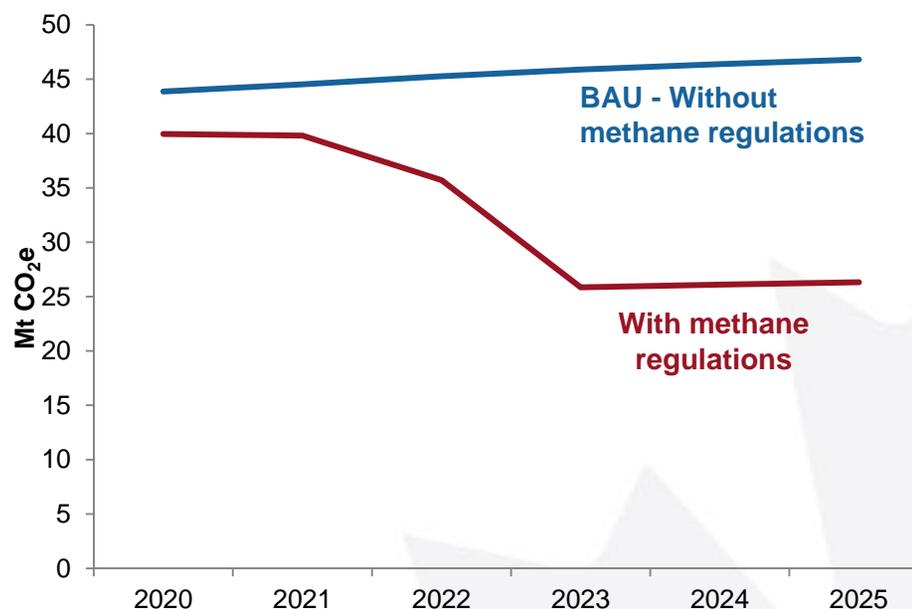
Element	Approach
Coming Into Force	2020
Coverage	All hydraulically fractured wells with significant gas (gas-to-oil ratio >53:1)
Requirement	No Venting gas associated with flowback
Exemptions	When gas associated with flowback cannot maintain combustion (e.g. high presence of nitrogen)
Reduction Action	Operators can choose between: <ol style="list-style-type: none"> conservation of the gas for re-use on site or for sale or destruction of the gas.



Well completion

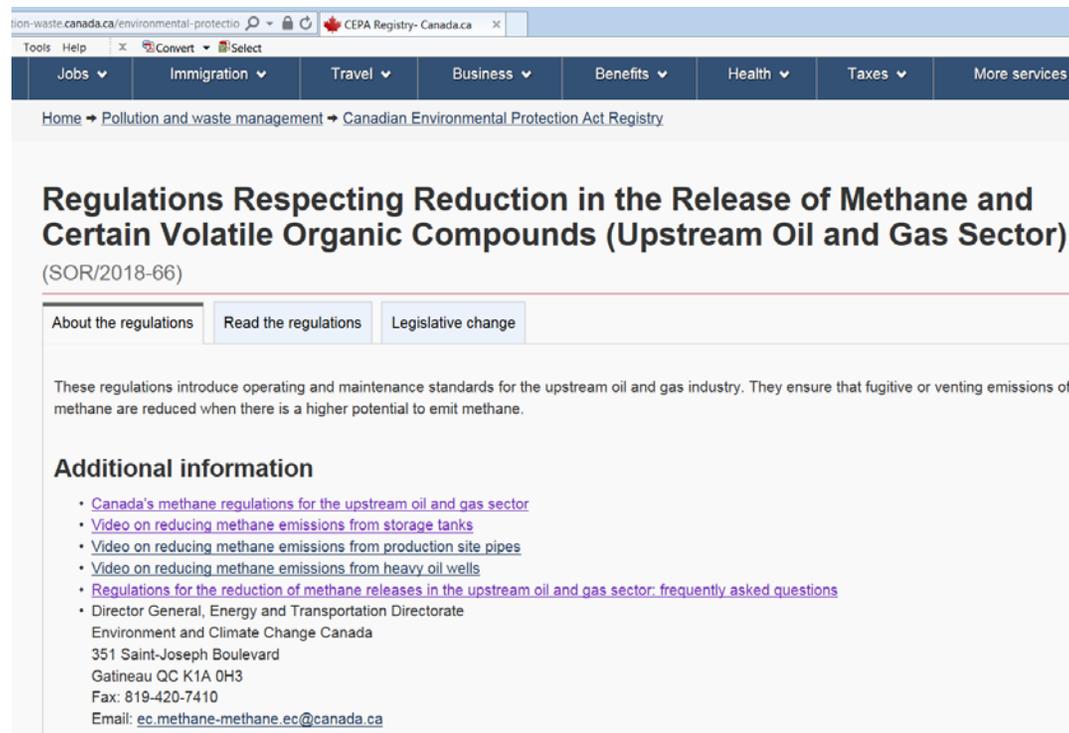
Methane Regulations – Benefits

- Canada will **meet its commitment** to reduce methane emissions from the oil and gas sector by 40% of 2012 levels by 2025.
- **Avoided climate change damages:** \$11.6 billion
- **Reduced air pollution health and environmental benefits:** \$240 million
- **Expected net benefits:** \$8.9 billion



For More Information

- Methane webpage on CEPA Registry: <https://pollution-waste.canada.ca/environmental-protection-registry/regulations/view?id=146>



The screenshot shows a web browser window with the URL <https://pollution-waste.canada.ca/environmental-protection-registry/regulations/view?id=146>. The page title is "Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector) (SOR/2018-66)". The page content includes a navigation menu with options like Jobs, Immigration, Travel, Business, Benefits, Health, Taxes, and More services. Below the title, there are three tabs: "About the regulations", "Read the regulations", and "Legislative change". The main text states: "These regulations introduce operating and maintenance standards for the upstream oil and gas industry. They ensure that fugitive or venting emissions of methane are reduced when there is a higher potential to emit methane." Under the heading "Additional information", there is a list of links: "Canada's methane regulations for the upstream oil and gas sector", "Video on reducing methane emissions from storage tanks", "Video on reducing methane emissions from production site pipes", "Video on reducing methane emissions from heavy oil wells", and "Regulations for the reduction of methane releases in the upstream oil and gas sector: frequently asked questions". At the bottom, contact information for the Director General, Energy and Transportation Directorate, Environment and Climate Change Canada, is provided, including the address (351 Saint-Joseph Boulevard, Gatineau QC K1A 0H3), fax number (819-420-7410), and email address (ec.methane-methane.ec@canada.ca).