Methane Regulations for the Upstream Oil & Gas Sector

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Intentional release of natural gas (methane) from a storage tank only visible through an infrared camera

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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 CO$_2$e)

- Upstream Oil and Gas: 44%
- Agriculture: 28%
- Waste: 23%
- Other Energy Sources: 4%
- Electricity: 0%
- Industrial Processes and Product use: 0%
- Transportation: 1%

Source: 2017 NIR
CO$_2$ and SLCP measures are complementary strategies

Source: UN Environment Program / World Meteorological Organization 2011
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)

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 will achieve significant reductions in GHG emissions, through **reductions in fugitive and venting emissions**.

• The Regulations would require onshore and offshore upstream oil and gas facilities to comply with standards depending on the source of the emissions:

  • **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 compressors and pneumatics which have their own limits, and well completion with hydraulic fracturing, emergencies, blowdowns)
    • **Specific limits** for compressors and pneumatic devices
    • **No venting** allowed for well completions involving hydraulic fracturing
Compliance Flowchart – Draft

1. Did the combined (venting + destroyed + delivered) gas volume exceed 40,000 m³ in the previous 12 months?
   - Yes: The facility must reduce venting to less than 15,000 m³ each year
   - No: The facility uses LDAR program

2. Do any pneumatic controllers function using hydrocarbon gas, bleed more than 0.17 m³/h or are there pumps that pump at least 20 L/day combined?
   - Yes: Traditional LDAR program
   - No: Approved alternative LDAR program

3. Was a leak found?
   - Yes: Capture
   - No: Was the facility an 'upstream oil and gas facility'?

4. Is the facility an 'upstream oil and gas facility'?
   - Yes: Does a compressor at the facility?
   - No: Does hydraulic fracturing take place?

5. Is there a compressor at the facility?
   - Yes: A measurement must be taken if gas is routed to a vent.
   - No: Does the production of the well expected to have a gas-to-oil ratio of at least 53:1?

6. Is the production of the well expected to have a gas-to-oil ratio of at least 53:1?
   - Yes: Does this vent exceed the applicable limit?
   - No: 0.88 m³/minute for existing centrifugal compressors over 5 MW

7. Does this vent exceed the applicable limit?
   - Yes: Fuel use – thermal energy, mechanical energy
   - No: 0.34 m³/minute for existing centrifugal compressors under 5 MW

8. Does this vent exceed the applicable limit?
   - Yes: Destroy Gas – flare, incinerate, enclosed combustor
   - No: 0.14 m³/minute for new centrifugal compressors

9. Does this vent exceed the applicable limit?
   - Yes: Equipment Upgrade – low bleed, no bleed (electric, solar)
   - No: 0.023 m³/minute for existing reciprocating compressors

10. Does this vent exceed the applicable limit?
    - Yes: Temporary Permit
    - No: 0.001 m³/minute for new reciprocating compressors

11. Does this vent exceed the applicable limit?
    - Yes: Repair or Maintain Equipment
    - No: No Action

12. Does this vent exceed the applicable limit?
    - Yes: Deliveries – gas sales, condensate sales, gas reinsertion
    - No: Conserve Gas
Methane Regulations — Benefits

• The regulations will allow Canada to **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
Methane Regulations – Timeline

Publication of Final Regulations in CG2
Apr 26

Coming into force - 1st set of requirements
Jan 1

Coming into force - 2nd set of requirements
Jan 1

2018 2019 2020 2021 2022 2023

Today

Development of potential equivalency agreements (BC, AB, SK)

Establishment of working group

Compliance-promotion (preparation & delivery)
For More Information

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