



# Proposed Methane Regulations

*A Significant Step in Addressing  
Climate Change in Canada*



# Overview

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- Canada's commitments
- What is methane and why ECCC is regulating
- Oil & gas emissions
- Proposed regulatory coverage
- Proposed regulatory approach
- Regulatory impact analysis
- How to provide comments



# Canada's Commitments

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- In the March 2016 Canada-U.S. Joint Statement on Climate, Energy and Arctic, the Prime Minister announced:
  - Canada will reduce methane emissions from the oil and gas sector by 40-45% by 2025 relative to 2012 levels
  - ECCC will publish proposed regulations to reduce methane emissions from new and existing oil and gas sources in early 2017
  - Regulations will be developed in collaboration with provinces/territories, Indigenous Peoples and stakeholders
- In December 2016, the Pan-Canadian Framework on Clean Growth and Climate Change reiterated Canada's commitment to reduce methane emissions from the oil and gas sector by 40-45% by 2025.

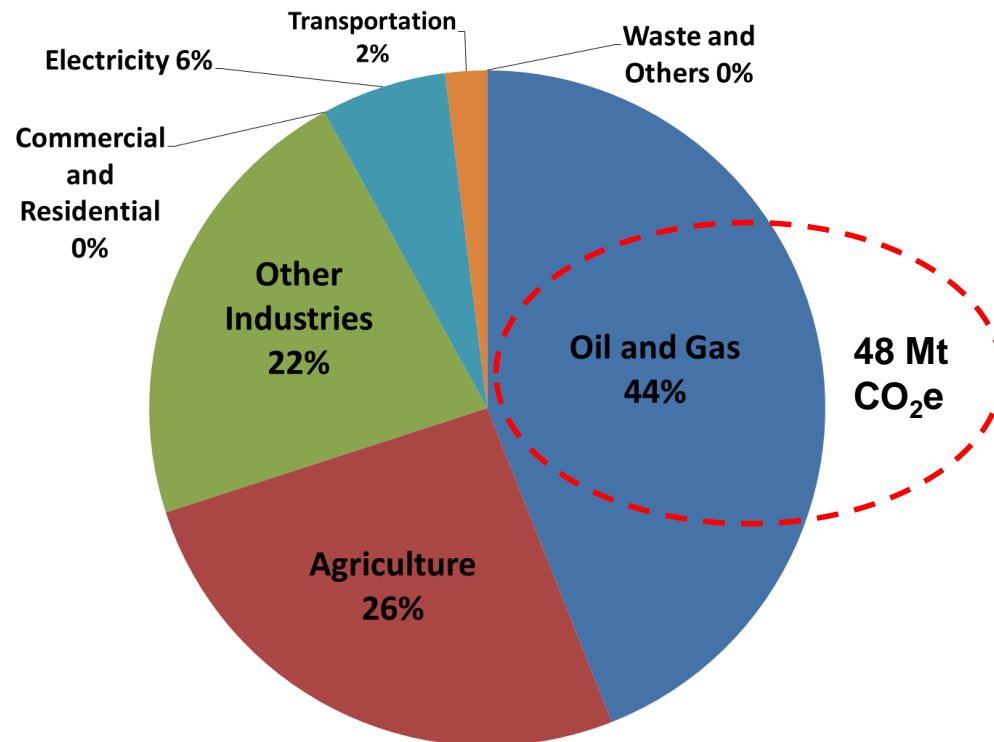


# Methane is a significant GHG

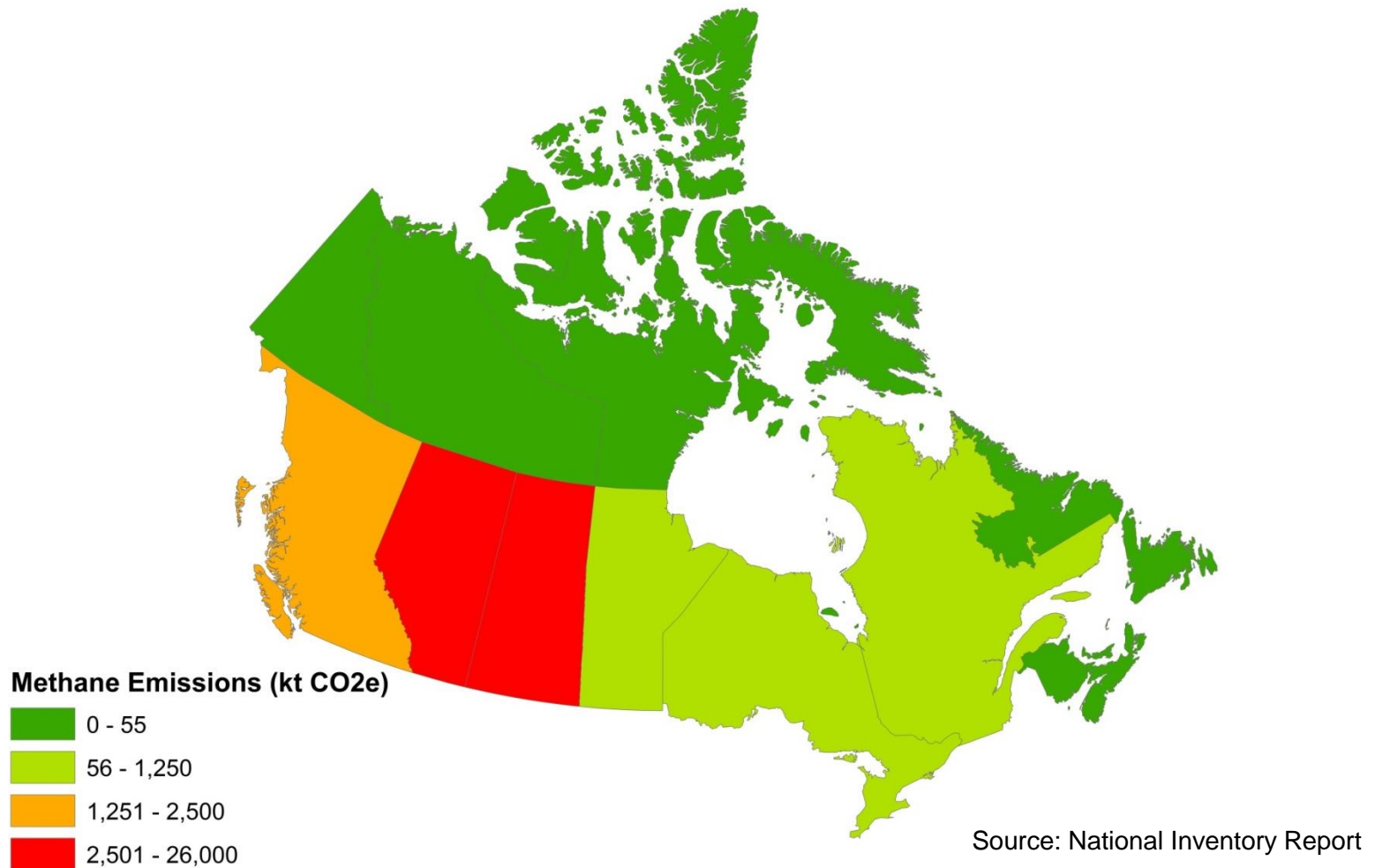
## What is it?

- Colorless, odorless, flammable gas
- **Primary component of natural gas**
- Global warming potential **25 times greater than CO<sub>2</sub>** over a 100-year period
- **Short-lived climate pollutant** – relatively short lifetime in the atmosphere and with a warming influence on climate
- 15% of Canada's 2012 greenhouse gas (GHG) emissions were methane

Canada's 2012  
Total Methane Emissions (110 Mt CO<sub>2</sub>e)

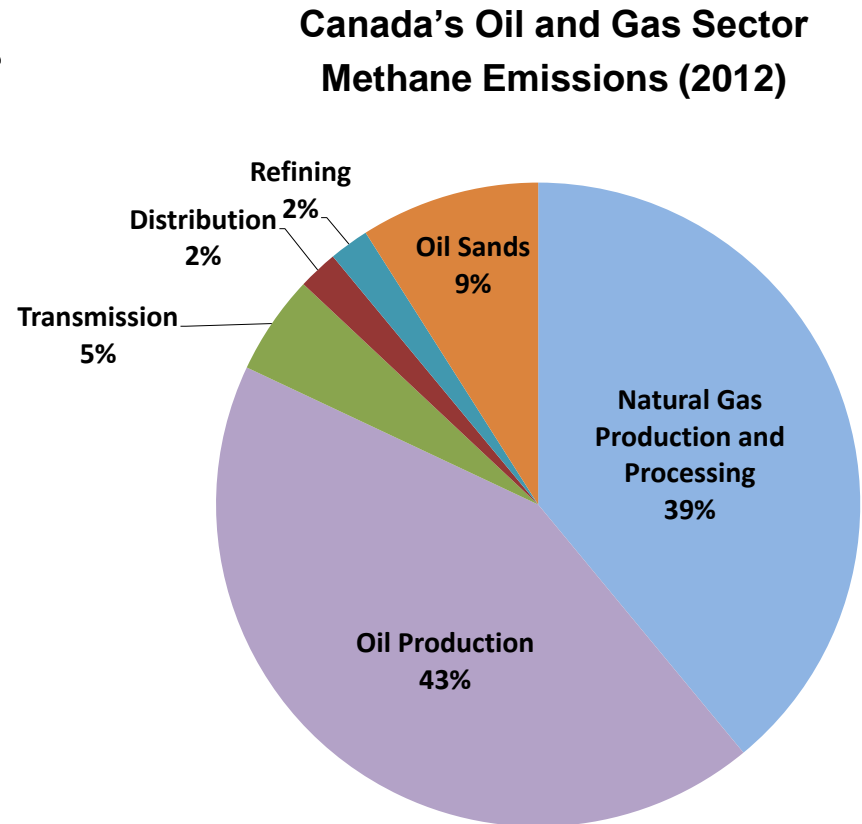


# Oil & Gas Methane Emissions across Canada (2012)



# Proposed Regulatory Coverage

- The proposed regulations cover over **95% of oil and gas methane emission sources**:
  - Natural gas production and processing
  - Oil production
  - Transmission
- A small portion of the sector's emissions are not covered:
  - Distribution
  - Refining
  - Some oil sands emissions



Source: National Inventory Report

# Proposed Regulatory Approach

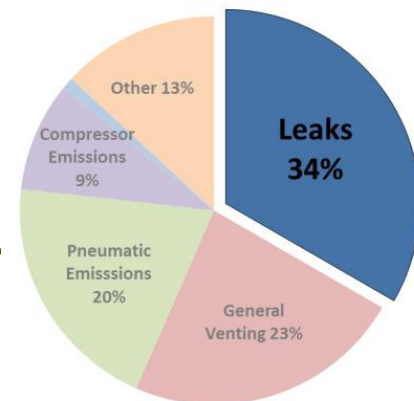
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- Regulations under ***Canadian Environmental Protection Act, 1999*** (CEPA)
- **Methane emission limits** are being proposed in 5 key areas:
  1. Fugitive emissions: equipment leaks
  2. Venting
  3. Pneumatic devices (pumps and controllers)
  4. Compressors
  5. Well completions after hydraulic fracturing
- Requirement for **corrective actions** (i.e. equipment repairs, gas combustion, gas conservation)
- Utilization of **existing provincial reporting structures** when possible, such as production accounting systems



# 1. Fugitives: Equipment Leaks

(34% of methane oil & gas emissions)



- Implementation of a **leak detection and repair program (LDAR)** to detect and repair gas leaks

Element	Proposed Approach
Coming Into Force	2020
Coverage	Larger facilities (facilities receiving at least 60 000 m <sup>3</sup> of hydrocarbon gas in a year)
Frequency of Inspection	3 times per year
Inspection Methods	Infrared cameras, sniffers, innovative methods (e.g. satellites, drones, etc.)
Timelines for Repair	<i>Offshore:</i> 365 days <i>Onshore:</i> within 30 days, or next shutdown
Exemptions	Single wellheads



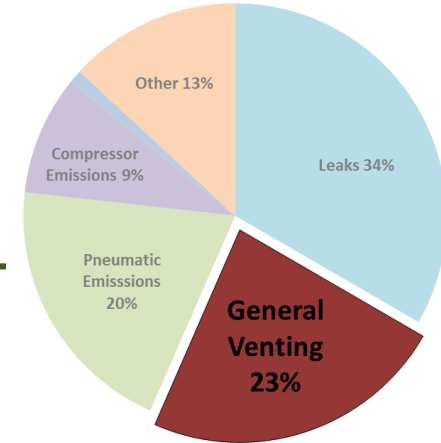
Leak from a wellhead only visible with an infrared camera





# 2. Venting

## (23% of methane oil & gas emissions)



- **Restriction on venting** of gas => Reduction of venting emissions by 95%
- Utilization of **current provincial reporting** activities

Element	Proposed Approach
Coming Into Force	2023
Coverage	Larger facilities (facilities receiving at least 60 000 m <sup>3</sup> of hydrocarbon gas in a year)
Maximum allowable venting limit	250 m <sup>3</sup> / month
Exemptions	Emergency venting
Reduction Method	Conservation or destruction

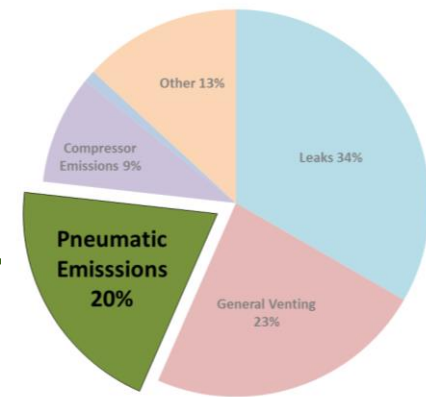


Intentional venting from storage tank



# 3. Pneumatic Devices

(20% of methane oil & gas emissions)



- **Pneumatic device:** automated instrument that are driven by hydrocarbon gas widely used in oil & gas industry to maintain a process condition or to pump liquids.
- Use of **non-emitting controllers** for larger facilities; **low-emitting** (i.e. 0.17 m<sup>3</sup>/hour standard) for smaller ones
- Use of **non-emitting pumps** for larger pump rates

Element	Proposed Approach
Coming Into Force	2023
Coverage	<u>Controllers:</u> non-emitting if total compressor power rating is at least 745 kW; low bleed if less than 745 kW <u>Pumps:</u> must not function using hydrocarbon gas for pumping rates of > 20L/day in a month
Exemptions	<u>Controllers:</u> exemptions possible for operational needs <u>Pumps:</u> exemption permits if no feasible non-emitting technology
Reduction Method	Conservation <u>or</u> destruction <u>or</u> replacement with non-emitting / low-bleed

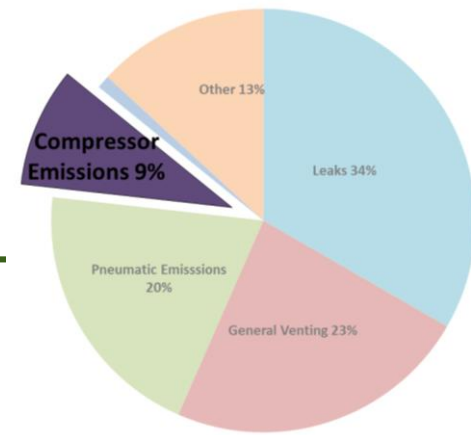


Pneumatic controller



# 4. Compressors

(9% of methane oil & gas emissions)



- **Compressor:** a mechanical device that increases the pressure of natural gas and allows the gas to be transported from the production site, through the supply chain and to the consumer
- Requirement for **annual measurements** of compressor vents

Element	Proposed Approach
Coming Into Force	2020
Coverage	Existing compressors must meet limits, new compressors must conserve emissions
Limit	0.17 m <sup>3</sup> /minute for centrifugal compressors; 0.023 m <sup>3</sup> /minute per rod packing for reciprocating compressors
Corrective Action Timelines	90 days for centrifugal compressors, 30 days for reciprocating compressors
Measurement	Annually
Exemption	No measurement required if emissions are conserved or destroyed.



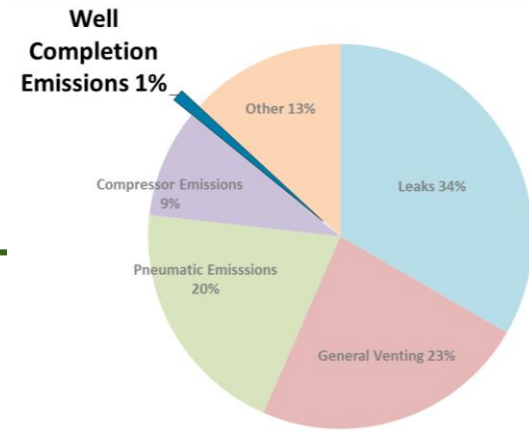
Compressor



# 5. Well Completions after Hydraulic Fracturing

## (1% of methane oil & gas emissions)

- Prohibition on venting at facilities during fracturing operations at oil & gas wells



Element	Proposed Approach
Coming Into Force	2020
Coverage	Fractured wells with high gas-to-oil ratios (>53:1)
Reduction Action	conservation or destruction
Exemption	Alberta and British Columbia



Well completion

# Regulatory Impact Analysis

## *Cost and Benefits*

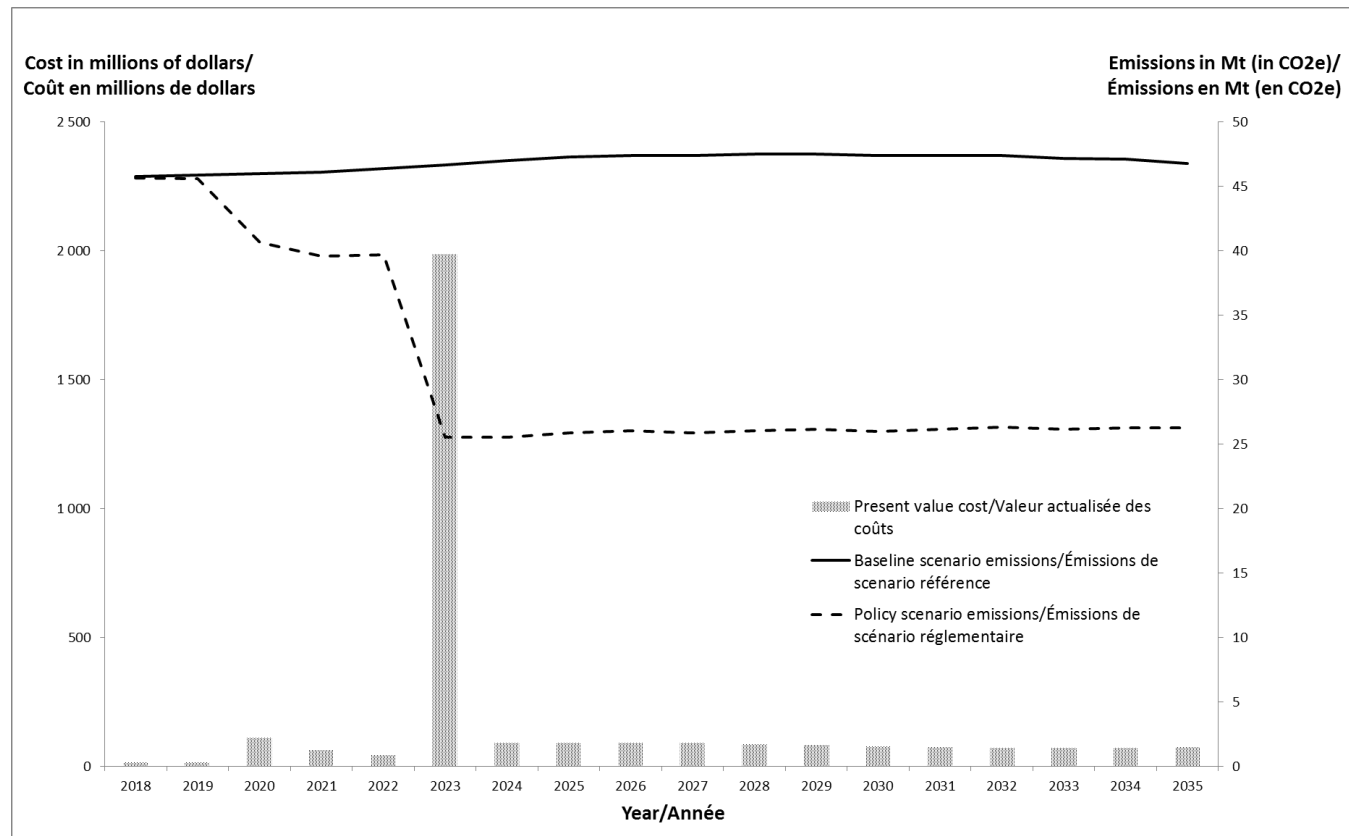
- **Costs** for oil and gas industry estimated at \$3.3 billion over the 2018-2035 period (~ 0.4% of estimated cumulative industry expenditures [\$700 billion] over this period).
- **Avoided climate change damages** expected for proposed reductions are valued at \$13.4 billion over 2018-2035 (reduction of 282 megatonnes of CO<sub>2</sub>e).
- Value of **conserved gas** estimated at \$1.6 billion over 2018-2035.
- Expected net **benefits** of **\$11.7 billion over 2018-2035**
- **Air quality co-benefits** from the VOC reductions (not yet factored into the cost analysis)
- Reducing methane is the **lowest cost GHG-related abatement opportunity** in energy sector:
  - ECCC: estimated average cost of C\$10/tonne CO<sub>2</sub>e over 2018-2030 period



# Regulatory Impact Analysis

## Cost and Benefits

Figure 1: Baseline and Policy Methane Emissions and Compliance Costs by Year



# Regulatory Impact Analysis

## Cost and Benefits

Table 1: Industry compliance costs by proposed standard (millions of dollars)

Proposed Standard	2018-2025	2026-2030	2031-2035	Total
Facility production venting	749	229	222	1,201
Leak detection and repairs	187	102	85	374
Well completion after hydraulic fracturing	16	17	8	41
Pneumatic controllers and pumps	1,411	53	28	1,492
Compressors	74	45	38	157
<b>Total</b>	<b>2,437</b>	<b>446</b>	<b>381</b>	<b>3,265</b>



# Regulatory Impact Analysis

## Cost and Benefits

Table 2: Summary of benefits and costs

Monetized Impacts (millions of dollars)	2018 -2025	2026 -2030	2031 -2035	Total
Climate change benefits	3,858	4,873	4,697	13,429
Value of conserved gas	477	586	521	1,585
<b>Total benefits</b>	<b>4,336</b>	<b>5,460</b>	<b>5,218</b>	<b>15,014</b>
Industry compliance costs	2,437	446	381	3,265
Industry administrative costs	11	6	5	21
Government administrative costs	5	2	2	8
<b>Total costs</b>	<b>2,453</b>	<b>454</b>	<b>389</b>	<b>3,295</b>
<b>Net benefits</b>	<b>1,883</b>	<b>5,006</b>	<b>4,895</b>	<b>11,719</b>
<b>Quantified benefits</b>				
Net GHG reduction (Mt CO <sub>2</sub> e)	80	102	100	282
Gas conserved (PJ)	184	241	238	663
VOC reduction (kt)	186	286	297	769
<b>Qualitative Benefits</b>				
Health and environmental benefits due to VOC emission reductions				



# How to Provide Comments

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- The proposed regulations have been published in the *Canada Gazette*, Part I on **May 27, 2017**: [www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=243](http://www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=243)
- The 60-day public comment period ends on **July 26, 2017**.
- Comments can be submitted to:
  - Helen Ryan
  - Director General, Energy and Transportation Directorate
  - Environment and Climate Change Canada
  - 351 St-Joseph Boulevard
  - Gatineau, QC K1A 0H3
  - Email: [ec.methane-methane.ec@canada.ca](mailto:ec.methane-methane.ec@canada.ca)

