

REVIEW OF CANADA'S METHANE REGULATIONS FOR THE UPSTREAM OIL AND GAS SECTOR

DECEMBER 2021



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EXECUTIVE SUMMARY

Methane (CH₄) is a hydrocarbon gas that is the main component of natural gas, and is also a greenhouse gas (GHG) with a global warming potential far greater than carbon dioxide (CO₂). Methane makes up about 13% of Canada's total GHG emissions, and the oil and gas sector accounts for about 40% of Canada's methane emissions.

In 2016, the Government of Canada committed to a national 40% to 45% methane reduction below 2012 levels by 2025 from Canada's highest emitting sector, oil and gas. A number of federal and provincial actions have taken place in support of this goal, including the publication of federal regulations under the Canadian Environmental Protection Act, 1999, federal investment programs such as the Emissions Reduction Fund and a series of provincial regulations. Equivalency agreements were finalized between the Government of Canada and the Governments of British Columbia, Alberta and Saskatchewan to enable regional tailored approaches to methane mitigation in their respective oil and gas sectors while ensuring equivalent environmental outcomes.

In the December 2020 strengthened climate plan, *A Healthy Environment and a Healthy Economy*, the Government of Canada reaffirmed its commitment to achieving its 2025 methane target, and committed to publish this report by the end of 2021 to demonstrate progress of federal actions towards achieving this target.

In June 2021, a federal review of Canada's national approach to reducing oil and gas methane by 40% to 45% by 2025 relative to 2012 levels was launched in consultation with provincial governments, industry, environmental non-governmental organizations, and Indigenous organizations.

This report concludes that Canada is on track to meet its 2025 target for methane reductions from the oil and gas sector. The report also acknowledges that recent scientific studies indicate methane emissions have historically been underestimated in Canada. While the report recognizes the important progress Canada has made in achieving its 2025 target, the Government recognizes that more work needs to be done to drive further reductions in this sector.

This review takes into account existing federal and provincial methane regulations – which are modelled to achieve reductions of 39% by 2025, relative to 2012 levels. It also recognizes that additional reductions are anticipated from other programs and initiatives, whose impacts have not been quantified in this analysis. As such, the results shown in this report represent minimum expected emission reductions from this sector.

To build on this important work, going forward, the federal government will:

- Re-focus Natural Resources Canada's Emissions Reduction Fund Onshore Program to drive additional, incremental methane emission reductions consistent with the changing economic context in the oil and gas sector, and in response to recommendations from the Commissioner of Environment and Sustainable Development

- Publish, in early 2022, a discussion paper to consult on Canada's new commitment to reducing oil and gas methane emissions by at least 75% by 2030 compared to 2012 levels, and introduce strengthened draft regulations by early 2023
- Improve quantification of fugitive methane emissions from the oil and gas sector, including revised emissions based on a new quantification methodology for national emissions within the 2022 edition of the National Inventory Report
- Work with international partners, including the United States, to identify best practices, improve measuring and reporting and drive low-cost reductions in the sector
- Developing a plan to reduce methane emissions across the broader Canadian economy in support of the Global Methane Pledge and the goals in Canada's Climate Plan.

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PURPOSE OF THE REVIEW

In the December 2020 Strengthened Climate Plan, *A Healthy Environment and a Healthy Economy*, the Government of Canada committed to publicly reporting on the efficacy of federal actions to achieve the 2025 oil and gas methane reduction target. This report provides an analytical update and review of current regulations and other policies that reduce methane emissions from the oil and gas sector.

BACKGROUND/CONTEXT

Historical and current GHG emissions, including methane, are causing the global average surface temperature to increase, leading to climatic impacts which are already becoming evident such as the increased frequency and severity of extreme weather events, thawing permafrost, eroding coastlines and rising sea levels. These impacts are expected to worsen as temperatures rise. Climate change is of major concern for society due to negative impacts on biodiversity, natural habitats, agriculture and food supplies, infrastructure, and low-lying and coastal communities. The economic and environmental impacts of climate change are a major threat to Canada and to the global community.

Methane and the oil and gas sector

Methane (CH₄) is a hydrocarbon gas that is the main component of natural gas. In its pure state, methane is a colourless, odourless flammable gas and is a toxic substance listed under Schedule 1 of the *Canadian Environmental Protection Act, 1999* (CEPA). Methane is also a greenhouse gas (GHG) with a global warming potential that is more than 80 times greater than carbon dioxide (CO₂) over a 20-year period, and more than 25 times greater over a 100-year period, as confirmed by the recent report from the Sixth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC). Methane makes up about 13% of Canada's total GHG emissions.

Methane is a short-lived climate pollutant with a relatively short lifespan of a 12 to 15 years in the atmosphere compared to CO₂ and other longer-lived GHGs, which remain in the atmosphere for a century or longer. Atmospheric levels of methane thus respond relatively quickly to changes in emissions since they are removed quickly from the atmosphere. As a result of the potency and short lifespan of methane, reducing emissions has the potential to bring significant near-term climate benefits.

In addition to its significant climate impacts, methane also has significant health impacts because it is a precursor to ground-level ozone and particulate matter (PM_{2.5}), which are the main constituents of smog. In fact, according to the Global Methane Assessment, ground-level ozone formed from methane emissions is responsible for approximately half a million premature deaths per year globally and hundreds of thousands of hospital admissions due to asthma, and it harms ecosystems and crops by suppressing growth and diminishing production. Furthermore, volatile organic compounds (VOCs) are co-emitted with methane from the oil and gas sector, and are known to have adverse health effects and contribute to smog formation. Thus reducing methane emissions can contribute to improved air quality and health outcomes.

In Canada's current National Inventory of GHG Emissions, about 40% of total methane emissions are attributed to the oil and gas sector, and its facilities are the largest industrial emitters of methane in Canada. Methane emissions from this sector are mostly from

upstream activities, such as exploration, drilling, production and field processing. During oil and gas extraction and processing, methane can leak accidentally or be released intentionally into the environment for safety or other purposes, like if it is not deemed economical to conserve.

Canada's commitment to methane reductions

Significantly reducing methane emissions from the oil and gas sector is a critical part of Canada's climate plan to reduce pollution in the oil and gas sector, improve air quality, drive innovation in the industry and transition to net zero. Tackling methane emissions from the oil and gas sector is one of the lowest-cost GHG reduction opportunities in Canada.

In March 2016, Canada and the U.S. issued a *Joint Statement on Climate, Energy, and Arctic Leadership*, where both countries committed to “reduce methane emissions by 40% to 45% below 2012 levels by 2025 from the oil and gas sector, and explore new opportunities for additional methane reductions.” To achieve this target, both countries committed to regulate methane emissions in the oil and gas sector.

More specifically, Canada committed that Environment and Climate Change Canada (ECCC) would “regulate methane emissions from new and existing oil and gas sources” and would “publish an initial phase of proposed regulations by early 2017.”

Later in 2016, the Government of Canada released its climate plan, the *Pan-Canadian Framework on Clean Growth and Climate Change*, which reaffirmed Canada's commitment to “reduce methane emissions from the oil and gas sector by 40% to 45% below 2012 levels by 2025”. It also indicated that the federal government would work with provinces and territories to achieve this objective, including through equivalency agreements.

In April 2018, Canada finalized its methane regulations titled *Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)*, under which the first requirements came into force in January 2020, with the rest of the requirements coming into force by 2023.

In 2020, the Government of Canada announced that it had finalized equivalency agreements with the provinces of Alberta, British Columbia (B.C.), and Saskatchewan, to recognize provincial methane regulations as meeting equivalent emissions-reduction outcomes to the federal regulations.

In the December 2020 strengthened climate plan, *A Healthy Environment and a Healthy Economy*, the Government of Canada reaffirmed its commitment to its existing 2025 target, to lay the foundation for additional reductions by 2030 and 2035, and reiterated it will continue to work with provincial partners, civil society, and industry to ensure that methane objectives are achieved. The Government committed to publicly report on the efficacy of the suite of federal actions to achieve the 2025 methane target in late 2021.

METHANE-RELATED REGULATIONS AND EQUIVALENCY AGREEMENTS

The *Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)* (the Federal Regulations) aim to reduce methane emissions as well as the amount of VOCs released into the air.

Federal methane regulations

These regulations apply to upstream oil and gas facilities that extract, process and transport hydrocarbon gas. More specifically, they apply to facilities that:

- produce and/or receive (potential to emit) more than 60,000 m³ of hydrocarbon gas per year
- compress natural gas
- undertake hydraulic fracturing during well completions outside of B.C. and Alberta with gas-to-oil ratios of at least 53:1

When upstream oil and gas facilities exceed the potential to emit, the regulations introduce emissions limits and require industry to regularly inspect and repair equipment to reduce emissions. The key emission sources in the upstream oil and gas sector covered by the regulations are:

- fugitives (leaks)
- production venting
- venting from pneumatic devices
- venting from compressors
- venting from well completions involving hydraulic fracturing

These regulations offer the oil and gas sector many flexible options to reduce their emissions with the technology and process changes that are best suited to each facility design and production profile. They are designed with innovation in mind, focused on emissions reduction outcomes, allowing technology development and operational insight to provide solutions. These regulations have also provided an opportunity to develop Canadian clean tech innovations in the sector, offering world-leading solutions for countries around the world.

They also help Canada's oil and gas industry conserve valuable hydrocarbon gas that would otherwise be wasted, allowing producers to save over \$1 billion worth of hydrocarbon gas between 2018 and 2035. For this reason, reducing methane emissions from this sector is among the lowest cost GHG reduction opportunities in the energy sector.

Equivalency agreements

Section 10 of the *Canadian Environmental Protection Act, 1999* (CEPA) authorizes the Minister of the Environment to enter into an equivalency agreement with a province, territory or aboriginal government if the Minister and the government of the other jurisdiction agree, in writing, that they are in force under the laws applicable in that jurisdiction:

- provisions that are equivalent to a regulation made under CEPA
- provisions similar to sections 17 to 20 of CEPA allowing for citizens to request investigation of alleged offences

Where such an agreement has been entered into with another government, the Governor in Council may make an order declaring that the provisions of the CEPA regulations that are the subject of the equivalency agreement do not apply in the jurisdiction of that government.

The intent of equivalency agreements is to minimize the duplication of environmental regulations. The Minister is responsible for reporting annually to Parliament on the administration of equivalency agreements.

In 2020, the Government of Canada announced that it had finalized equivalency agreements with the provinces of Alberta, B.C., and Saskatchewan, to recognize provincial methane regulations as meeting equivalent emissions-reduction outcomes to the federal regulations. These agreements allow the provincial methane regulations to replace the federal regulations for up to 5 years.

The federal government published projections for methane emission reductions from the oil and gas sector in each of those provinces from 2020 to 2029, under each of the regulatory scenarios (the federal regulations or the provincial regulations).

Provincial regulations

The provinces of Alberta, B.C. and Saskatchewan have each established provincial methane regulations for the oil and gas sector, which are described below.

Alberta

In December 2018, the Alberta Energy Regulator (AER) made amendments to *Directive 060: Upstream Petroleum Industry Flaring, Incinerating, and Venting Directive* and *Directive 017: Measurement Requirements for Oil and Gas Operations* (the Alberta Directives), which put in place requirements for methane emissions reductions. These requirements are incorporated by reference in the *Methane Emission Reductions Regulation* (the Alberta Regulations), which was registered in December 2018. In May 2020, further amendments were made to Directive 060 and Directive 017 to increase the stringency and move forward the implementation dates for certain provisions.

Similar to the federal regulations, the Alberta Regulations introduce control measures to reduce fugitive and venting emissions of methane from the upstream oil and gas sector. The Alberta Regulations differs from the Federal Regulations in that control measures are more stringent for new facilities starting in 2022. Additionally, the Alberta Regulations contain more stringent requirements for pneumatic controllers and introduce specific requirements for glycol dehydrators, which are used to remove moisture from produced gas. The Alberta Regulations allow a lower leak detection frequency at some facility types and contains less stringent routine venting and pneumatic pump requirements.

On November 11, 2020, the Government of Canada published an Order-in-Council declaring that the federal methane regulations do not apply in Alberta, based on an equivalency agreement, which will be in place for 5 years.

British Columbia

In December 2018, the B.C. Oil and Gas Commission approved amendments to the *Drilling and Production Regulation* (the B.C. Regulations) to manage methane emissions from the oil and gas sector in a manner equivalent to the federal methane regulations. The B.C. Regulations requires control measures to reduce fugitive and venting methane emissions from the upstream oil and gas sector. It contains regulatory standards for the same sources as the Federal Regulations with additional standards for glycol dehydrators. The B.C. Regulation differs from the Federal Regulations in that control measures are more stringent for new facilities beginning in 2021 and most requirements for existing facilities come into force in 2022. In addition, the B.C. Regulations require a lower leak detection frequency at some facility types and contains less stringent routine venting requirements. However, these standards apply to a greater number of facilities.

On April 15, 2020, the Government of Canada published an Order-in-Council declaring that the federal methane regulations for the oil and gas sector do not apply in B.C., based on an equivalency agreement which will be in place for 5 years.

Saskatchewan

On January 1, 2019, the Government of Saskatchewan enacted *The Oil and Gas Emissions Management Regulations* (the Saskatchewan Regulations), which apply company-level GHG emissions intensity limits to venting and flaring emissions from oil facilities. Emissions intensity limits vary depending on year, geography and production class (for example, heavy oil facilities vs. non-heavy oil facilities). The allowed emissions intensity declines from 2020 to 2025, after which it remains constant until 2030.

In addition to these regulations, in December 2019, the Government of Saskatchewan published the *Directive PNG036: Venting and Flaring Requirements* (Directive PNG036) to provide venting limits on oil and gas facilities, as well as restrictions on temporary venting during well completions. On April 9, 2020, Directive PNG036 was revised to add LDAR provisions, which requires companies to implement an LDAR program for gas facilities. Applicable facilities include gas batteries, gas plants, and gas gathering systems. In December 2019, the Government of Saskatchewan also published a third version of the

Directive PNG017: Measurement Requirements for Oil and Gas Operations (Directive PNG017) to consolidate, clarify, and update requirements on oil and gas facilities with respect to how fuel gas, vent gas and flare gas volumes are measured for accounting and reporting purposes. Directive PNG017 was further amended to require enhanced quantification of associated gas at heavy oil facilities on April 9, 2020.

On November 11, 2020, the Government of Canada published an Order-in-Council declaring that the federal methane regulations for the oil and gas sector do not apply in Saskatchewan, based on an equivalency agreement that will terminate on or by December 31, 2024.

2025 METHANE EMISSIONS PROJECTIONS

This report outlines estimated methane emission reductions from Canada's oil and gas sector based on developing detailed engineering emissions estimates for 2 scenarios: a baseline scenario, which projects future emissions without regulatory action, and a regulatory scenario which projects future emissions with regulations in place. The results from these scenarios were then scaled to ECCC's overall emission estimates for the oil and gas sector to ensure consistency between models. The difference between the emissions in the baseline scenario and the emissions in the regulatory scenario were used to estimate the incremental reductions.

Methodology

A bottom-up engineering modelling approach was developed using baseline and regulatory scenarios for GHG and air pollution emissions in order to evaluate the environmental outcomes associated with the federal upstream oil and gas methane regulations and the equivalency agreements with the provinces of Alberta, B.C., and Saskatchewan. This model is updated annually to incorporate the latest studies, reports and scientific information.

The model uses a variety of source-level input parameters, such as facility counts, component counts, emission factors and gas speciation to estimate emissions and emission reduction outcomes associated with federal and provincial methane regulations. Facility count information, component counts, and emission factors are derived from engineering studies and provincial reporting data.

Emission profiles are generated for a baseline scenario and a regulatory scenario using engineering input parameters, such as those listed above. Emission profiles under the baseline case represent a scenario where no regulatory action is assumed. For regulatory scenarios, a counterfactual is developed where emissions profiles are generated for each emission source by incorporating key information from the regulatory text outlined in the federal and provincial regulations. These emission profiles are multiplied by the corresponding number of historical facilities for each specific oil and gas product to generate total historical emissions at the facility level.

To project baseline and regulatory scenarios, the model generates facility count forecasts based on oil and gas production projections retrieved from the Canada Energy Regulator's annual Energy Future reports. The above emission profiles are multiplied by the number of facilities for each forecast period to generate total future emissions at the facility level.

Baseline and regulatory emissions are aggregated based on sector and province, and are aligned to the Energy, Emissions and Economy Model for Canada (E3MC), one of ECCC's models used for developing GHG emission projections. This alignment is done to ensure

that emissions from the bottom-up model are consistent with the estimates produced in E3MC. As a final step, emission reductions are estimated by subtracting emissions in the baseline scenario from emissions generated in the regulatory scenario. Moving forward, the department plans to engage stakeholders and provinces to discuss the best available data and modelling of methane emissions.

The data for the source-level input parameters differ for each emission source:

Pneumatic Devices

- Determining Bleed Rates for Pneumatic Devices in British Columbia (Prasino, 2013)
- Update of Equipment, Component and Fugitive Emission Factors for Alberta Upstream Oil and Gas Study (Clearstone, 2018)
- British Columbia Oil and Gas Methane Emissions Field Study (Cap-Op Energy, 2019)
- Oil and Gas Inventory Information Enhancement and Economic Analysis Study (Advisian, 2019)
- Pneumatic Vent Gas Measurement (Spartan Controls, 2018)

Fugitive Equipment Leaks

- Update of Equipment, Component and Fugitive Emission Factors for Alberta Upstream Oil and Gas Study (Clearstone, 2018)
- British Columbia Oil and Gas Methane Emissions Field Study (Cap-Op Energy, 2019)
- EPA Protocol for Equipment Leak Emission Estimates (EPA, 1995)

Compressors

- Statistical Analysis of Leak Detection and Repair in Canada (Carbon Limits, 2017)
- Using the Greenhouse Gas Reporting Program (GHGRP) Data to Improve the National Greenhouse Gas Emissions Inventory for Petroleum and Natural Gas Systems (API, 2017)

Glycol Dehydrators

- AER Methane Emission Reduction Methodology and Assumptions

Routine Venting

- Petrinex reporting system by province

Other Sources

- National inventory report 1990–2018: greenhouse gas sources and sinks in Canada 2020 (ECCC, 2020)

Updates

Since the publication of the equivalency agreements in 2020, various updates have been made to the bottom-up engineering model for 2021. The most notable updates were considered during the review. They include:

Activity Data

- Included historical oil and gas facility counts from provincial data
- Included oil and gas production projections from the CER's Energy Future 2020 Report (Reference Scenario)
- Included oil and gas emissions projections from ECCC's 2020 Reference Case

Pneumatic Devices

- Updated pneumatic device counts in Saskatchewan based on a 2019 Advisian study
- Incorporated pneumatic device conversions associated with Alberta's GHG emissions offset program for pneumatic devices
- Incorporated pneumatic device conversions associated with B.C.'s Clean Infrastructure Royalty Credit Program and the CleanBC Industry Fund

Routine Venting

- Incorporated 2019 historical production and venting data used to compute updated venting and flaring emission factors

Gas Speciation

- Updated gas speciation in Alberta based on facility type and region retrieved from Tyner and Johnson (2020)
- Revised gas speciation in Saskatchewan using gas composition data provided by the Government of Saskatchewan

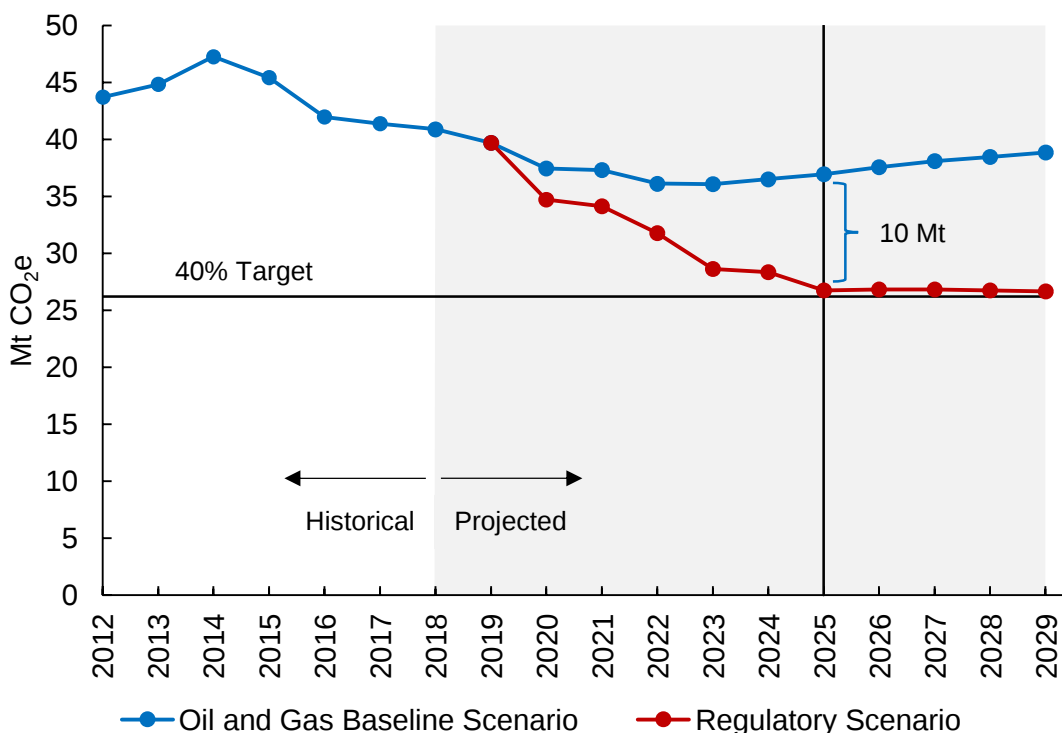
Analysis

Methane emission projections derived from ECCC's 2020 Reference Case and the latest iteration of ECCC's bottom-up engineering model are illustrated in Figure 1. The baseline (blue line) represents methane emissions from the entire oil and gas sector at the national level. This includes upstream, midstream and downstream methane emissions from venting, flaring and fugitive sources, as well as methane emissions from incomplete fuel combustion. Both onshore emissions and offshore emissions are also included in the baseline.

As shown in Figure 1, historical methane emissions peak in 2014 and subsequently decline for the rest of the historical period. Historical declines in methane emissions are mainly attributed to reductions in venting and flaring in response to provincial requirements. In the projected period, methane emissions in the baseline scenario continue declining until reaching a low-point in 2022-23, partly reflecting decreases in pre-pandemic natural gas

production due to global supply and demand factors, climate policies such as carbon pricing decreasing the demand for fossil fuel products, and adverse oil and gas production impacts due to the COVID-19 pandemic. After 2023, emissions in the projected baseline scenario are expected to increase slightly due to forecasted growth in oil and gas production.

Figure 1. Baseline and Regulatory GHG Emissions



The regulatory scenario (red line) represents modelled methane emissions based on regulatory regimes in place in B.C., Alberta, Saskatchewan, Manitoba, Ontario, as well as interprovincial natural gas transmission pipelines. Emission reductions from the remaining provinces and territories are expected to be negligible based on their respective oil and gas production forecasts. Implementation of methane regulations are modelled to lead to declines in methane emissions from 2020 to 2025. After 2025, emissions under the regulatory scenario level off due to no additional regulatory requirements taking effect.

This analysis represents both federal methane regulations and provincial equivalency agreements currently in force. In B.C. and Alberta, regulatory scenario emissions are based on their respective provincial regulations, as they exceed the federal methane regulations throughout the 2020-29 period. In Saskatchewan, regulatory scenario emissions post-2024 are assumed to be consistent with the province meeting similar environmental outcomes as quantified under the federal regulations. For interprovincial natural gas transmission pipelines and the remaining provinces, it is assumed that the federal methane regulations apply.

Greenhouse gas emission reductions

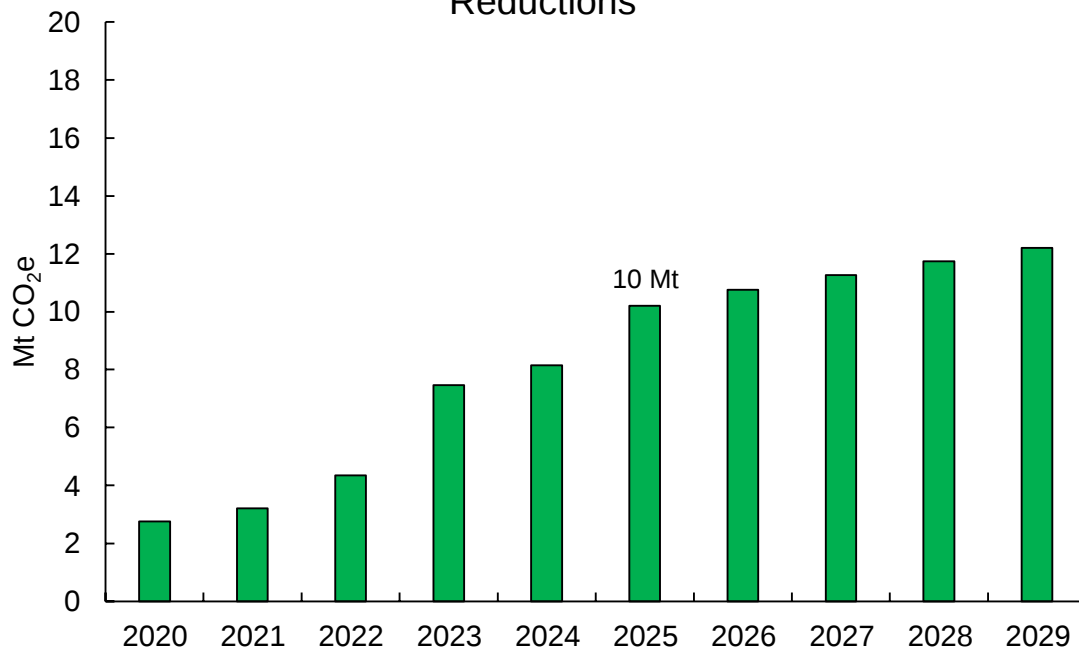
The federal and provincial methane regimes will reduce methane emissions that would otherwise be emitted into the atmosphere. At the same time, the federal and provincial regulations will result in increases in flaring activities, which will slightly increase CO₂ emissions. Given this, the estimates shown in Figure 2 represent the net GHG emission reductions by accounting for reductions in CH₄ and CO₂ as well as increases in CO₂ from increased flaring activities.

As illustrated in Figure 2, the federal and provincial methane regimes are expected to result in approximately 10 megatonnes (Mt) of emission reductions in carbon dioxide equivalent (CO₂e) in 2025 (using a global warming potential of 25). This represents a 39% reduction in methane emissions from 2012 levels, or 17 Mt CO₂e. However, these estimates do not include the impacts of certain other policies affecting the oil and gas sector, at both the federal and provincial level.

To ensure the integrity of the analytical conclusions published in this report, ECCC has not quantified the impacts of certain policies for which there is not yet sufficient data, where preliminary data is not yet consistent with the reference case for this analysis, or where the timing of emission reductions could not be definitely attributed to the period of analysis. However, all of these efforts would contribute toward methane emission reductions relevant to the 2025 objective. Examples are listed in the section of this report titled “Other Policies Affecting the Oil and Gas Sector.”

As such, the results shown in this report represent minimum expected emission reductions from this sector, as the programs mentioned above are likely to lower baseline emissions or generate further emission reductions.

Figure 2. Annual Regulatory GHG Emission Reductions



Overall, the federal and provincial methane regulations alone are modelled to achieve methane emission reductions of 39% by 2025, relative to 2012 levels. Additional reductions are anticipated from other programs and initiatives. Therefore, we conclude that Canada is on track to meet its 2025 target for methane reductions from the oil and gas sector which lays a strong foundation for advancing action for further reducing methane emissions from the oil and gas sector by 75% by 2030.

OTHER POLICIES AFFECTING THE OIL AND GAS SECTOR

As noted earlier in this report, there are additional policies in place at both the federal and provincial levels that are expected to reduce methane emissions from the oil and gas sector.

Emissions Reduction Fund

In fall 2020, the Government of Canada launched the \$750 million Emissions Reduction Fund (ERF) to support onshore and offshore oil and gas companies reduce methane and other greenhouse gas emissions, and to retain jobs and enhance the competitiveness of the sector in response to the COVID-19 pandemic.

The ERF includes 3 streams:

- 1) Onshore Deployment (\$675 million) of infrastructure and green solutions to reduce or eliminate methane emissions from venting and flaring in upstream and midstream operations (provides a 75%/25% mix of repayable and non-repayable funding).
- 2) Offshore Deployment (\$42 million) of emissions reducing technologies (provides fully repayable funding).
- 3) Offshore research, development and demonstration (\$33M) of emissions reducing technologies (provides fully non-repayable funding).

This can greatly benefit the environment, as well as workers and communities involved in the oil and gas industry. This program can also contribute to achieving Canada's 2025 methane reduction target for the oil and gas sector, and lay the foundation for additional reductions by 2030.

Since its launch in fall 2020, the ERF Onshore Program has supported 81 projects across Western Canada. Under the terms of the program, project proponents are required to continuously meter, to quantify and report on volumes of conserved gas for five years following project completion, as well as jobs associated with funded projects. The Government of Canada will report on emissions reductions achieved and jobs, as the information becomes available.

Clean Fuel Regulations

The *Clean Fuel Regulations* are also known as Canada's Clean Fuel Standard.

In December 2020, the Government of Canada released proposed *Clean Fuel Regulations* and published the draft regulations in *Canada Gazette*, Part I. These regulations would

require liquid fuel suppliers (such as gasoline and diesel) to gradually reduce the carbon intensity of the fuels they produce and sell for use in Canada by 2030.

The *Clean Fuel Regulations* take a lifecycle carbon intensity approach, meaning it takes into account the emissions associated with all stages of fuel production and use, from extraction through processing, distribution, and end-use. The *Clean Fuel Regulations* will incent the uptake of technologies that reduce the lifecycle carbon intensity of fossil fuels, such as carbon capture and storage, renewable energy, or technologies that reduce methane emissions.

Under the *Clean Fuel Regulations*, methane reduction projects that are beyond existing federal or provincial regulatory requirements could be eligible for credit creation under the generic quantification method. Credits created under the generic quantification method can be used to satisfy up to 10% of a regulated party's annual obligation.

Provincial methane reduction programs

The provinces of B.C., Alberta and Saskatchewan have programs to support methane reductions from the oil and gas sector:

- **B.C.'s Clean Infrastructure Royalty Credit Program**
 - o this program incentivizes clean technologies and solutions in B.C.'s oil and natural gas sector, by supporting projects that reduce methane emissions from vented sources, through equipment retrofits or replacements
 - o the program allows oil and gas companies to apply for a royalty deduction of up to 50% of the cost of an eligible project (if approved)
 - o in 2018, the program was allocated \$19.3 million in royalty deductions
- **CleanBC Industry Fund**
 - o the CleanBC Industry Fund invests a portion of carbon tax revenues into emission reduction projects for large industrial operations
 - o according to the [project list](#), in 2019 and 2020, the fund committed approximately \$4 million to 6 projects that reduce methane emissions from the oil and gas sector
- **Emissions Reduction Alberta**
 - o using revenue from Alberta's Technology Innovation and Emissions Reduction (TIER) system, Emissions Reduction Alberta (ERA) invests in projects that advance the development and adoption of innovative technologies to reduce GHG emissions
 - o one of its strategic areas is "Cleaner Oil & Gas", and it has funded numerous projects that target methane emissions. In 2017, ERA committed up to \$29.5 million in funding to 12 innovative methane-reducing technology projects

- **Alberta Methane Emissions Program**
 - o this \$17-million program, funded through the TIER Fund, supports the development of methane emissions reduction technology to help Alberta reach its methane emissions reduction goals
- **Alberta's Baseline and Reduction Opportunity Assessment Program**
 - o this \$10-million program, funded through the TIER Fund, offers financial support to small and medium conventional oil and gas operators to assess and reduce on-site methane emissions
- **Saskatchewan's Oil and Gas Processing Investment Incentive**
 - o this program offers transferable oil and gas royalty/freehold production tax credits for qualified greenfield or brownfield value-added projects at a rate of 15% of eligible program costs
 - o this can include projects that could reduce methane emissions
- **Saskatchewan Petroleum Innovation Incentive**
 - o this program offers transferable oil and gas royalty/freehold production tax credits for qualified innovation commercialization projects at a rate of 25% of eligible project costs
 - o it targets a broad range of innovations deployed across all segments of Saskatchewan's oil and gas industry

Clean Resource Innovation Network (CRIN)

As a pan-Canadian 'network of networks' CRIN is focused on ensuring Canada's hydrocarbon resources are sustainably developed and integrated into global energy systems. To enable the work of the network, CRIN provides a variety of support approaches and programs, including some funding for member projects.

CRIN's \$50 million Reducing Environmental Footprint technology competition is designed to advance technology solutions for high-priority environmental challenges across the oil and gas industry with the intent to export technologies internationally and for application within Canada's industrial sector. One of the competition's focus areas is cost effective methane emissions detection, quantification, monitoring, reporting and mitigation technologies to address methane challenges from upstream, midstream, downstream, and transportation of oil and gas. This is intended to help the energy sector meet Canada's 40% to 45% methane emissions reduction target by 2025. Members include technology developers and large and small methane emitters from across Canada.

CONCLUSIONS

Based on the analysis outlined in this report, we conclude that Canada is on track to meet its 2025 target for methane reductions from the oil and gas sector. However, the Government recognizes that more work is needed to drive further reductions in this sector.

Path forward

Canada will continue working to reduce methane emissions domestically, while also working to support methane reductions internationally.

Emissions Reduction Fund

Considering the changing economic environment, Canada's recently strengthened methane commitments, and the Commissioner of the Environment and Sustainable Development's 2021 audit recommendations, Natural Resources Canada is refocusing the Emissions Reduction Fund Onshore Program by re-issuing its third application intake period with the following strengthened criteria:

- Narrowing the scope of projects funded to only those that fully eliminate the intentional routine venting and flaring of methane;
- Applying strengthened criteria to make sure we are funding projects that provide the greatest return on investment from an emissions reductions perspective; and,
- Providing greater transparency and ensuring accounting of expected emissions reductions demonstrates what is incremental to Canada's methane regulations.

The Government of Canada will continue to identify opportunities to reduce methane emissions in the oil gas sector, building on the contributions the Emissions Reduction Fund Onshore Program has made to-date.

Enhanced methane regulations for 2030

In October 2021, the Minister of ECCC announced a commitment to reducing oil and gas methane emissions by at least 75% below 2012 levels by 2030. This builds on the Government of Canada's commitment in its 2020 Strengthened Climate Plan to:

- Strengthen Canada's approach to reducing methane emissions from the oil and gas sector by establishing new targets for 2030 and 2035, based on international best practices. Canada is an active participant in international initiatives to reduce methane emissions. For example, Canada is a founding member of the Climate and Clean Air Coalition. Together with the International Energy Agency, the Coalition is targeting a 45% reduction in methane emissions by 2025 and 60% to 75% by 2030. The design of the amended federal regulations to achieve additional reductions in

2030 and 2035 will be determined through consultations with provinces, territories, the oil and gas industry and civil society.

The Government will publish a discussion paper in early 2022 to engage provinces, industry, civil society and Indigenous peoples on how to achieve this increased ambition and strengthen the existing regulatory regime. Draft regulations are expected to follow in early 2023.

ECCC will continue to engage with stakeholders on data and modelling used for new policy development.

National Inventory Report (NIR) methodology improvements

Every year, Canada reports methane emissions to the United Nations Framework Convention on Climate Change (UNFCCC) in its National Inventory Report (NIR). This report compiles statistics on human-caused GHG emissions, including methane, for each year dating back to 1990. The inventory is under continuous improvement as new data and methodologies become available.

The Government recognizes atmospheric measurements of methane have indicated that the official national inventory under-estimates emissions from Canada's oil and gas sector. As such, improvements to Canada's methane emission estimates in this sector are currently being developed. The planned improvements will use updated estimation methodologies, including new science, and is expected to better align inventory estimates with atmospheric observations. These improvements will result in an upward revision in methane emissions reported in Canada's 2022 national inventory, which will include updated emissions for the years 1990 to 2020. Additional methodological changes in subsequent inventories are anticipated to further improve the accuracy of methane emission estimates for the oil and gas sector.

International activities or commitments on methane

Canada will continue to be an active participant in multilateral fora addressing methane, and our constructive role can be leveraged to support global action by sharing best practices and lessons learned in implementing regulations and incentive programs. In 2021, Canada joined the Global Methane Pledge to reduce global methane emissions by 30% by 2030, compared to 2020 levels. The vast majority of Canada's methane emissions are from 3 sectors: oil and gas, landfills and agriculture. Under the Pledge, Canada will focus on standards to achieve all feasible reductions in the energy and waste sectors. In support of the Pledge and the goals in Canada's climate plan, the federal government also announced Canada's commitment to developing a plan to reduce methane emissions across the broader Canadian economy and to reducing oil and gas methane emissions by at least 75% below 2012 levels by 2030.

The United States has committed to take action on mitigating methane emissions from the oil and gas industry, and in November 2021, the U.S. Environmental Protection Agency

released proposed methane regulations. Canada will continue to engage and collaborate with the U.S. on methane monitoring, modelling and regulatory development.

Canada is also active in several multilateral fora focusing on addressing methane emissions. For example, Canada chairs the Steering Committee of the Global Methane Initiative, a public-private partnership that promotes cooperation on knowledge sharing, technological exchange, and project demonstration. Canada has committed to chairing the group until 2023. Canada also participates as co-chair of the oil and gas subcommittee and the biogas subcommittee within the Global Methane Initiative.

Canada is also a founder and active partner in the *Climate and Clean Air Coalition (CCAC)*. The CCAC is a voluntary international organization working to help developing countries establish and implement integrated air pollution and climate change policies to reduce the emissions of short-lived climate pollutants (SLCPs), including methane.

As part of the 8 countries that make up the Arctic Council, Canada is also actively engaged in addressing methane from an arctic perspective. Under the last Canadian chairmanship of the Arctic Council, the “Enhanced Black Carbon and Methane Emissions Reductions: An Arctic Council Framework for Action” was developed and adopted. Among other things, the Framework commits Arctic to take enhanced, ambitious, national and collective action to significantly reduce overall methane emissions. Canada is active in Arctic Council work on science, research, monitoring, reporting, and mitigation of the impacts and sources of methane emissions.

ANNEX - WHAT WE HEARD FROM PARTNERS

During the federal methane review, stakeholders, Indigenous organizations, experts and provinces and territories were provided with an opportunity to share perspectives, insights, expertise as well as data associated with mitigating methane. To accomplish this, ECCC organized a series of workshops and meetings and provided groups and individuals with an opportunity to make written submissions to ECCC. A total of 5 written submissions were received by ECCC during the review period.

Key points from what we heard include:

- Stakeholders expressed general concern about the perceived early timing of the review and the impact of COVID-19-related uncertainty. There were also some suggestions that it may be better to wait for more provincial data, or to delay the review to align with provincial plans to review their work in 2022
- Stakeholders emphasized the importance of collaborating with provinces on emissions data
- Several stakeholders stressed the importance of the continuation of equivalency agreements
- Stakeholders emphasized the importance of collaboration going forward, and the need for a multi-faceted approach, including funding programs like the Emission Reduction Fund
- None of the submissions included data that would impact the modelling
- Stakeholders have commented on the need to have enhanced transparency around data which inform methane policy, including the proposal to have range estimates for projected emissions

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