A Regulatory Framework

To Cap Oil and Gas Sector Greenhouse Gas Emissions

Environment and Climate Change Canada
Environnement et Changement climatique Canada

Canada

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Context

The Government of Canada has committed to cap and reduce greenhouse gas emissions (GHG emissions) from the oil and gas sector at a pace and scale necessary to contribute to Canada's 2030 climate goals, to achieve net-zero GHG emissions by 2050, and in a way that allows the sector to compete in the emerging net-zero global economy. As the country's largest source of GHG emissions and the only major source that continues to grow, decarbonizing the oil and gas sector is critical to achieving Canada's emission targets. The sector is also an economic powerhouse, proven innovator, and source of good jobs. The emissions cap will help decarbonize oil and gas production to make Canada a highly efficient producer supplying global demand and ensure the sector is on a path to net-zero by 2050. The emissions cap is an integral piece of the Government of Canada's Roadmap to support the decarbonization of oil and gas production.

On July 18, 2022, the Government published a discussion paper outlining two regulatory options to cap GHG emissions from the oil and gas sector: (1) a new national GHG emissions cap-and-trade system, and (2) modifications to existing carbon pricing systems. The discussion document sought feedback on the two options, and generated a significant response. Environment and Climate Change Canada (ECCC) received over 150 submissions from provinces and territories, Indigenous organizations, industry, environmental non-governmental organizations, and academics, as well as over 25,000 comments from members of the public. Feedback from provinces and territories, Indigenous partners, industry, and civil society on the discussion paper has informed the Government's approach on this important policy.

In addition to the formal comment period, the Government of Canada has held a significant number of information webinars and bilateral meetings with various partners and interested parties. Information gathered and feedback received during this engagement has been taken into consideration in the design of the proposed regulatory approach.

Approach

The Government plans to implement a national emissions cap-and-trade system through regulations to be made under the *Canadian Environmental Protection Act, 1999* (CEPA). This will establish a technology-neutral market-based instrument that supports cost efficient emissions reductions, while ensuring that the GHG emissions from the sector do not go above a set level and decline over time. This framework outlines the proposed regulatory approach, including key design details and the approach to setting the emissions cap and the maximum allowable emissions from covered sources in 2030. The Government is seeking input on the framework to help inform the development of draft regulations, which it intends to publish in mid-2024 for comment.

Since 1988, CEPA has been used to address a wide range of environmental protection issues, including air pollution, pollution from chemicals, and GHG emissions, by prohibiting the release of substances which pose a risk to the environment or to human health. Over 100 regulations and regulatory amendments have been implemented under CEPA. CEPA's enforcement regime is well established and understood by the thousands of companies regulated under the Act. ECCC has ensured a high rate of compliance of its environmental regulations through proactive engagement with regulatees and the ongoing provision of guidance.

The proposed approach will cap GHG emissions, not production. The Government has engaged with industry to assess the level of technically achievable emissions reductions by 2030. The proposal below reflects this foundational work.

Written submissions in response to this document should be submitted by email by February 5, 2024, to PlanPetrolieretGazier-OilandGasPlan@ec.gc.ca.

Proposed key components

The purpose of the proposed regulations is to reduce GHG emissions from the oil and gas sector through the establishment of a national emission cap-and-trade system. The regulations will establish reporting and verification requirements and a legal upper bound on GHG emissions. Consideration will be given to how to phase in the system between 2026 and 2030.

In a cap-and-trade system the regulator issues a quantity of emission allowances that define the emissions cap and some compliance flexibilities allow emissions to exceed the emissions cap up to a legal upper bound. Regulated entities are prohibited from emitting GHGs without remitting one emission allowance or other eligible compliance unit for each tonne of GHG emissions up to the legal upper bound. Emission allowances and some other types of compliance units can be bought and sold on an emissions trading market, prioritizing lower-cost abatement opportunities.

The Regulations will identify the regulated parties, establish the terms and conditions for registering to the system and for the issue, use and trading of emission allowances, set out criteria for the creation and use of eligible compliance units and the information that must be quantified, verified and reported by those that are required to register in the system. Through the legal upper bound on GHG emissions, the regulations will enact a prohibition to emit GHGs, and establish total allowable GHG emissions from covered facilities.

Design principles

The design of the proposed emissions cap-and-trade regulations will be based on the following principles, subject to practical considerations:

- **GHG emissions decline at a pace and scale to meet net-zero by 2050**
  The regulations would be designed to ensure GHG emissions from the upstream and liquified natural gas (LNG) subsectors decline over time to reach net-zero by 2050.

- **Accounts for technically achievable emissions reductions and forecasted global oil and gas demand**
  The legal upper bound on GHG emissions from covered sources would account for technically achievable emissions reductions and for the forecasted global demand for oil and gas.

- **Administrative burden is minimized**
  The regulations would be designed to complement and leverage other federal and provincial regulations and programs and to minimize additional administrative requirements, to the extent possible.

- **A commitment to review**
  The effectiveness of the emissions cap-and-trade regulations would be subject to ongoing monitoring

and regular reviews, including to assess the legal upper bound on GHG emissions, the quantity of allowances available and the approach to their allocation, and access to compliance flexibility.

Scope of application

The emissions cap-and-trade system would apply to LNG facilities and to upstream oil and gas facilities, including offshore facilities. These subsectors represent the majority of GHG emissions from the oil and gas sector – the upstream subsector represented 85% of sector emissions in 2021, and new LNG production is projected to be a growing source of emissions.

It is proposed that the following activities would be covered by the regulations:

- Bitumen and other crude oil production, including upstream oil gathering pipelines when they are part of a covered facility, — other than bitumen extracted from surface mining and other than petroleum refining, including:
    - extraction, processing, and production of light crude oil (having a density of less than 940 kg/m^3 at 15°C)
    - extraction, processing and production of bitumen or other heavy crude oil (having a density greater than or equal to 940 kg/m^3 at 15°C)
- Surface mining of oil sands and extraction of bitumen
- Upgrading of bitumen or heavy oil to produce synthetic crude oil
- Production and processing of natural gas and production of natural gas liquids, including upstream gas gathering pipelines when they are part of a covered facility
- Production of liquified natural gas

The upstream oil and gas subsector includes numerous small facilities that emit below the reporting threshold for the federal Greenhouse Gas Reporting Program of 10 kilotonnes of carbon dioxide equivalent (CO_2e) per year. Although these facilities are small emitters on an individual basis, taken together, they are estimated to represent approximately one third of the sector's total GHG emissions. Approaches that are in place to define and regulate smaller facilities for provincial reporting and regulatory purposes in British Columbia, Alberta and Saskatchewan are being examined to support an efficient federal approach to covering smaller emitting facilities under the emissions cap-and-trade regulations.

The cap-and-trade system would cover all direct GHG emissions, while also accounting for indirect emissions and emissions that are captured and permanently stored, as described later in this regulatory framework. The GHGs covered would include carbon dioxide, methane, nitrous oxide and others (for a complete list, see items 65 to 70 of Part 2 of Schedule 1 to CEPA*)*. The global warming potential of each GHG would be set out in the proposed regulations.

New facilities would have to register before emitting GHGs from a covered activity. Reporting and verification obligations would start on January 1 of the following year. Consideration is being given to delaying the first compliance period until after a new facility reaches a set proportion of its design capacity, or two years after first producing a product, whichever comes first. The treatment of closing facilities would also be specified.

Prohibition

All covered facilities would be prohibited from releasing any GHGs resulting from a covered activity unless they have first registered to the system. The regulations would also prohibit covered facilities from releasing GHGs

into the environment resulting from the specified industrial activities without remitting a sufficient number of compliance units for these GHG emissions.

Allocation of emission allowances

Each emission allowance would be equivalent to one tonne of CO_2e. Emission allowances issued under the cap-and-trade regulations would not be fungible with other carbon pricing systems or regulatory instruments.

When the first compliance period begins, allowances would initially be allocated free of charge (free allocation). It is proposed that the following principles guide the approach to free allocation:

- **Recognize better performers**
  The approach to free allocation of allowances would recognize better performers that are able to produce the same or similar products with a lower emissions intensity, thereby incenting all facilities to move towards highly efficient, low-carbon production.

- **Consistent and transparent**
  The approach would apply consistently within and across covered oil and gas activities and implemented in a transparent manner.

- **Minimize uncertainty**
  The approach would seek to enhance the certainty of the quantity of free allowances a facility would receive year-over-year, to the extent possible.

Any approach to free allocation may require an adjustment to the level of allowances allocated to each facility to ensure the total amount of allowances issued does not exceed the emissions cap. This would be done on a pro rata basis. It is proposed that the approach to free allocation be set based on a baseline production level and a free allocation rate for a given product or activity (CO_2e tonnes/unit of product produced). The total free allocation would be adjusted up or down on a facility basis should the facility's production rise or fall by more than a predetermined percentage from the baseline production level. This approach would adjust for some variability in production levels at individual facilities while increasing predictability of free allocations compared to a pure output-based approach, and thus help facilities better prepare to comply with regulatory requirements.

Auctioning of allowances, either in combination with free allocation or as a means to distribute all allowances, may be considered in later compliance periods.

Emission allowances and legal upper bound on emissions in 2030

There are two key values in the proposed approach: (1) the emissions cap level, which is equivalent to the total emission allowances issued by the government for a given year, and (2) the legal upper bound, which is the maximum emissions the sector will be allowed to emit that year, comprised of the total number of emission allowances issued plus the maximum allowable quantity of other eligible compliance units.

This approach will ensure that the sector reduces GHG emissions and is on a path to net-zero, while also providing some flexibility to enable the sector to respond to changes in global demand. It is informed by detailed analysis of decarbonization projects and potential technology deployment across the oil and gas sector, including technological readiness of key mitigation solutions and the timelines for their deployment. It also considers Canada's climate targets and global objectives as well as the stated climate policies of other countries, and how these may impact potential future demand for oil and gas and Canadian production levels.

It is proposed that the 2030 emissions cap (the number of allowances issued) be set at a level slightly below what emissions would be if covered sources achieved technically achievable emission reductions by 2030 and production was at 2019 levels. Based on current estimates, this would result in issuing a total quantity of allowances in 2030 of between 106 and 112 Mt CO_2e, which would be 35% to 38% below 2019 emission levels. Facilities that emit more than the allowances allocated would have some flexibility to compensate for a limited quantity of additional emissions, up to the level of the legal upper bound.

It is proposed that the legal upper bound in 2030 be set at a level that assumes that covered sources achieve technically achievable emission reductions by 2030 for production levels aligned with the Canada Energy Regulator's Canada Net-Zero scenario (CNZ). The CNZ scenario is aligned with a scenario where Canada and all parties to the Paris Agreement achieve their interim and net-zero climate targets, including the US and Europe achieving 2050 net-zero pledges, and China and India reaching net-zero by 2060 and 2070 respectively. Based on current information and analysis, this is estimated to represent a maximum level of emissions from covered sources in 2030 of between 131 and 137 Mt CO_2e, or about 20% to 23% below 2019 emission levels.[1,2] The legal upper bound would decrease over time to ensure that the sources covered by the emissions cap-and-trade system achieve net-zero GHG emissions by 2050.

This approach would set an emissions cap that holds the sector accountable for GHG emissions associated with production growth since 2019 but would also provide flexibility to emit up to a level that is based on production that is aligned with Canada achieving net-zero emissions by 2050 and that takes into account technically achievable emissions reductions. Based on current estimates of the legal upper bound and the emissions cap, in aggregate, the option to use other compliance units would be limited to approximately 25 Mt in 2030. To the extent that robust offset credits are used to account for these additional GHG emissions, the net emissions from the policy in 2030 could be as low as 106 to 112 Mt CO_2e. Proposed compliance units are outlined in more detail below.

Setting the allowance level and the maximum allowable emissions from covered sources for the post-2030 period will need to balance providing regulatory certainty with the challenges associated with projecting future conditions, including timelines to implement decarbonization projects and the future global demand for fossil fuels. The approach will include regular reviews of the emissions cap trajectory, the emissions trading market, and access to compliance flexibilities. These features will play an important role in ensuring the sector is positioned to continue to deploy technically achievable emissions reductions, be a highly efficient and low-carbon source of fossil fuels as the globe shifts to lower carbon emission and zero carbon emission energy sources, and achieves net-zero by 2050.

The final 2030 emissions cap and legal upper bound will be set based on the best available information at the time the regulations are finalized, informed by data and information received from interested parties in

[1] Calculated based on National Inventory Report 1990-2021: Greenhouse Gas Sources and Sinks in Canada, Table 2-12 Trends in GHG Emissions by Canadian Economic Sector. The 2019 emissions for natural gas production, conventional oil production, and oil sands (mining, in-situ, upgrading) is estimated to be 171 Mt CO_2e.

[2] See Annex I for more details on the estimates of technically achievable reductions and production projections for the Canada Net-Zero scenario that were used to develop the estimated allowance level and the maximum allowable emissions from covered sources in 2030.

response to this framework, as well as by related regulatory design details including coverage of indirect GHG emissions.

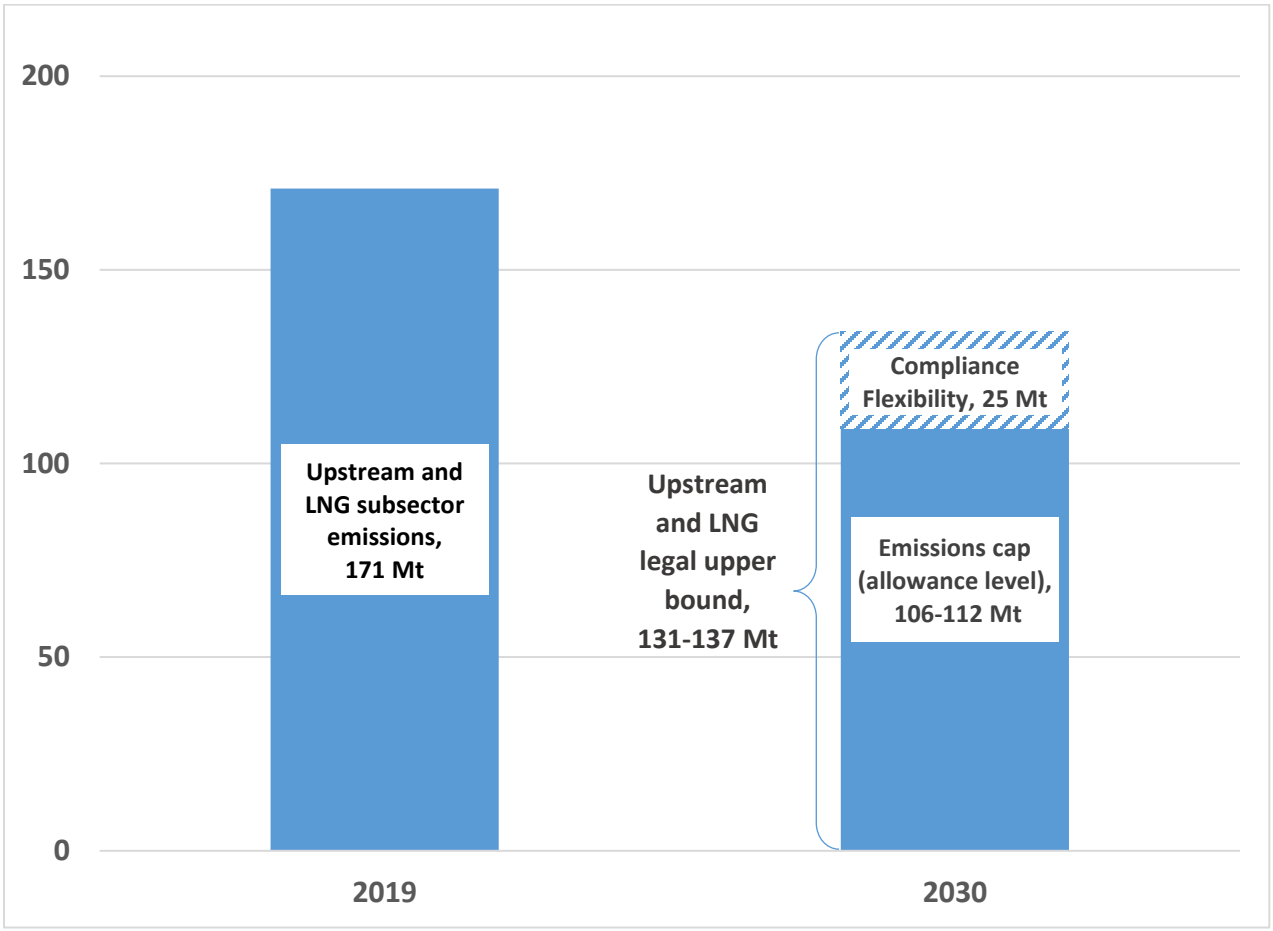

Figure 1: Estimated and projected oil and gas sector emissions (Mt CO2e) in 2019 and 2030[3]

Treatment of indirect emissions and stored emissions

The cap-and-trade system will apply to direct (Scope 1) GHG emissions. The proposed treatment of Scope 2 GHG emissions that are related to the production of oil and gas and LNG is discussed further below.[4]

The oil and gas sector uses thermal energy, electricity, and hydrogen in its industrial processes. If a facility does not generate its own thermal energy, electricity, or hydrogen, it can import it from another facility, or in the case of electricity, from the grid. Facilities may also produce these products for sale and export from the facility. The result is that facilities carry out varying levels of these activities with related impacts on their direct GHG emissions – those that import these products tend to have lower direct emissions and those that produce on-

[3] 2019 estimates are based on the National Inventory Report 1990-2021.

[4] There are three scopes of emissions in the sector: (1) Scope 1 emissions originate directly from sources that are owned or controlled by a sector (i.e., combustion, process, and fugitive emissions); (2) Scope 2 emissions are those generated indirectly and, (3) Scope 3 emissions are indirect emissions resulting from an organization's operations (i.e., emissions from supply chains). These emissions are often combusted in other sectors or other jurisdictions (e.g., exported crude oil; gasoline in internal combustion engine vehicles).

site, either for their own use or with excess for export from the facility, have higher direct emissions. Accounting for transfers of captured carbon dioxide (CO_2) between facilities for activities including enhanced oil recovery and permanent storage is also required to ensure that emission reductions associated with those activities are taken into account.

The oil and gas emissions cap-and-trade system would account for transfers of thermal energy, hydrogen, CO_2, and electricity to ensure that all GHG emissions that relate to the production of oil and gas are covered. This would aim to prevent GHG emissions from being shifted to unregulated facilities and to avoid creating an uneven playing field and unintended competitiveness impacts.

Facilities would be required to report and quantify information related to the purchase/sale, production, use and import/export from the facility of thermal energy, hydrogen, electricity, and transfers of CO_2 for storage. Where facility-specific information is not available, a default factor would be provided to estimate emissions.

Allowance allocations would be designed to take into account the electricity, thermal energy and hydrogen needs of the sector.

Compliance flexibility

A number of key decarbonization solutions for the sector, including carbon capture and storage, require significant time to deploy. Emissions trading, multi-year compliance periods and credit banking are common features of cap-and-trade systems because they give facilities flexibility with regards to the timing of the GHG emissions reductions they may have invested in. Other compliance flexibilities, such as allowing facilities to remit other types of compliance units (e.g., offset credits) can provide additional flexibility.

It is proposed that in addition to emissions trading, multi-year compliance periods, and credit banking, facilities have the option to remit domestic offset credits or make contributions to a decarbonization funding program to cover a limited portion of their GHG emissions. Consideration is also being given to allowing facilities to remit compliance units that represent mitigation outcomes that have been authorized for use by Canada as internationally transferred mitigation outcomes (ITMOs) to cover a portion of their GHG emissions.

Emissions trading among covered facilities

Emission allowances would be tradeable among covered facilities but would be unique to the oil and gas emissions cap-and-trade system. Likewise, surplus credits, performance credits or other permits or allowances from other regulations or carbon pricing systems, including federal and provincial output-based pricing systems or cap-and-trade systems, would not be eligible for use within the oil and gas emissions cap-and-trade system.[5]

Multi-year compliance periods

It is proposed that compliance periods have a length of three years. This would give facilities more time to achieve GHG emissions reductions before remitting allowances or compliance units to cover all of their GHG emissions vs. an annual compliance period.

[5] While credits from carbon pricing systems (federal, provincial) would not be eligible for use within the oil and gas emissions cap-and-trade system, emission reductions made by an oil and gas facility would count towards compliance obligations under both, as well as methane regulations. The oil and gas emissions cap-and-trade system will be designed to complement carbon pricing systems. This will also be considered as part of the interim review of carbon pricing, which the government has committed to completing by 2026.

Banking

Facilities would be able to bank allowances for up to two compliance periods (six years). This would be permitted for all allowances, whether allocated to a facility free of charge or purchased from another covered facility. Consideration is being given to including a limit on the total number of allowances that can be banked.

Decarbonization fund

The government is exploring options to include a decarbonization funding program as a compliance option. If included, covered facilities would have the option to make contributions into the fund in exchange for decarbonization fund units, which would be recognized as an eligible compliance unit. Use of decarbonization fund units for compliance under the regulations would be limited to 10% of a facility's GHG emissions. Contributions to the decarbonization fund would be used to support oil and gas sector decarbonization and would help decrease emissions at facilities that receive support from the fund.

It is proposed that the contribution rate to be issued a decarbonization fund unit would be set in the regulations at the estimated allowance price needed for the sector to reduce GHG emissions in-line with the legal upper bound. For example, modelling suggests when emission reduction incentives from other policies are taken into account (e.g., carbon pricing), the 2030 allowance price in an emissions cap-and-trade system to achieve a legal upper bound of 131 Mt to 137 Mt could be around $50 per tonne CO_2e.

Domestic offset credits

Offset credits or 'offsets' from robust offset programs represent real, additional, quantified, verified, permanent and unique GHG emissions reductions or removal enhancements. The use of robust offset credits as part of an emissions cap-and-trade system can provide covered facilities a means of meeting a more aggressive emissions cap while still achieving incremental emissions reductions on a net basis.

Covered facilities would have the option to remit offset credits from Canada's GHG Offset Credit System and provincial offset credits recognized for use under the federal *Output-Based Pricing System Regulations*[6] for up to the percentage of GHG emissions between the cap (total allowances issued in a given year) and the legal upper bound, net of contributions to the decarbonization fund. Based on current estimates, this is a maximum of approximately 20% of a facility's GHG emissions. The percentage would decrease for any contributions made to the decarbonization fund, for example, a facility that made contributions to the decarbonization fund up to the maximum limit of 10% of their GHG emissions, could only remit offset credits for up to another 10%.

The Government of Canada is exploring options to allow an offset credit that is remitted to count towards a facility's obligation under the emissions cap-and-trade regulations as well as be used by the same facility for compliance under the facility's applicable carbon pricing system, provided it compensates for the same tonne of GHG emissions.

In addition, the Government of Canada is exploring the concept of an offsets funding program. The concept is similar to a decarbonization fund in that covered facilities would have the option to make a contribution at a set rate to the fund in exchange for compliance units. If implemented, the proceeds collected by the fund would be used by the government to purchase domestic offsets and possibly ITMOs. The contribution rate could be set in a similar manner to the approach proposed for the decarbonization fund.

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[6] The current list of recognized programs and protocols can be found at the following link - https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/list-recognized-offset-programs-protocols.html

An offsets fund would help to provide greater cost certainty to the oil and gas industry and help mitigate the risks of adverse production impacts if the prices of offsets are greater than the market price of allowances. If pursued, this could be implemented in place of or in addition to provisions that enable the direct purchase of domestic offsets.

ITMOs

To provide additional flexibility, consideration is being given to allowing the use of ITMOs as a compliance option.[7] The use of ITMOs would be limited to a portion of the percentage of GHG emissions that can be covered by offset credits (i.e., a portion of the 20% of a facility's GHG emissions that can be covered by offset credits), to ensure that investment in domestic offset projects continues to be prioritized. Options for including ITMOs within a potential offsets fund are also under consideration.[8]

Reporting, quantification, and verification

All covered facilities would be required to submit annual reports, including reporting facility GHG emissions and production, and indirect GHG emissions. Facilities would be required to use the quantification methods specified in the regulations. Where possible, these quantification methods will align with existing requirements such as those under the Greenhouse Gas Reporting Program and provincial regulations. Permits may be available to allow facilities to use an alternative quantification method in certain circumstances.

The reports would need to be verified by a third party that meets the requirements set out in the regulations. It is proposed that these verified annual reports would be required to be submitted every July 31, and would include the information for the preceding calendar year.

The regulations would also specify requirements related to corrections of reports, material errors, record keeping, requests for confidentiality, and other administrative functions.

Coming into force and timelines for compliance

The regulations are targeted to come into force upon registration of the final regulations in 2025. Facilities would be required to register before the end of 2025, or before releasing GHGs as a result of carrying out a covered activity after January 1, 2026. Annual reporting of verified information using the specified quantification methods would be required for calendar years as early as 2026. Consideration will be given to how to phase in the system between 2026 and 2030. Once phased in, compliance periods would be three calendar years in length.

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[7] Article 6 of the Paris Agreement provides a framework for voluntary cooperation between countries in achieving climate goals. An ITMO is an accounting entry that reflects a quantity of GHG emissions reductions or removals that occurs in one country and that is voluntarily authorized and transferred for use towards another country's climate target or other international mitigation purpose. Authorization of an ITMO transfer requires a commitment from both the acquiring and host countries to make a corresponding adjustment with respect to their Nationally Determined Contribution (NDC) to prevent double counting of the emission reductions.

[8] The Government of Canada has not yet taken decisions with respect to acquiring, selling, or otherwise authorizing the use of ITMOs either domestically or internationally. While Canada's actions to date have focused on emission reduction measures within Canada, the *2030 Emission Reduction Plan* noted that ITMOs may offer the possibility of supporting global GHG emissions reductions at a lower cost, and therefore have the potential to complement domestic reduction efforts and contribute to sustainable development abroad.

Multi-year compliance periods would have both an annual compliance requirement and a final "true up" at the end of each compliance period. For example, for the first and second years of a given compliance period, covered facilities would be required to remit compliance units equal to 30% of their verified GHG emissions, less any GHGs permanently stored, during the preceding calendar year. At the end of each compliance period, covered facilities would be required to remit one emission allowance or eligible compliance unit for every tonne of GHGs they emitted during the entire compliance period, less emission allowances and compliance units remitted in interim years.

When selecting the appropriate enforcement response, ECCC officers will consider each instance of noncompliance in accordance with the *Compliance and Enforcement Policy for the Canadian Environmental Protection Act, 1999*.

Discussion Questions

- How should allowances be allocated? What should be taken into account? How should changes in production and new projects be considered?
- What process should be established to review the emissions cap trajectory for the post-2030 period?
- If, when and to what extent some compliance flexibilities should be phased down or phased out.
- How should the proposed approach to indirect GHG emissions be implemented?
- What measurement protocols or quantification methods most accurately estimate methane emissions at the facility level?
- What administrative approaches can be used to define and regulate facilities with GHG emissions below 10 kt CO_2e per year?
- How should the proceeds from the decarbonization funding program be distributed? How should contributions be used to support decarbonization of the oil and gas sector?
- What are the advantages and disadvantages of a federal offsets fund? How should a federal offsets fund operate?
- What role should ITMOs play in compliance flexibility?

Next Steps

The Government of Canada remains committed to ongoing engagement on opportunities and barriers to decarbonization of the sector and the design of the emissions cap and is seeking views on the information presented in this Framework. Formal written submissions in response to this document are invited. To ensure that your input can be considered as the emissions cap is developed, please submit written comments by email by February 5, 2024 (60 days after publication), to **PlanPetrolieretGazier-OilandGasPlan@ec.gc.ca**

In 2024, the Government of Canada plans to publish proposed regulations in Part I of the *Canada Gazette* for a 60-day public comment period. Formal written comments will also be sought on the proposal at that time. Publication of the final regulations is targeted for 2025, with the first reporting obligations starting as early as 2026 and full system requirements phased in between 2026 and 2030.

Annex I – Estimating the level of the 2030 emissions cap and legal upper bound

The estimated 2030 emissions cap (total allowances issued) and legal upper bound (maximum allowable emissions from covered sources) reflect a bottom-up analysis of the level of emissions that could be achieved if all technically achievable emissions reductions were deployed for a specific production forecast.

The 2030 emissions cap is designed to hold the sector accountable for GHG emissions increases associated with production increases beyond 2019, the last pre-pandemic year before the government's commitment to cap and reduce GHG emissions from the oil and gas sector. The 2019 production levels were used to develop the estimated emissions cap for 2030.

The 2030 legal upper bound is designed to align with Canada's commitment to achieve net-zero emissions by 2050. The production forecast used to develop the 2030 legal upper bound is grounded in the ***Canada Energy Regulator's (CER) Canada Net-Zero Forecast,*** which is based on a scenario where Canada and all other parties to the Paris Agreement achieve their interim and net-zero climate targets. This means that virtually all high-income countries achieve net-zero by 2050 and other large emitters like China and India reach net-zero by 2060 and 2070 respectively, as they have previously committed.

The production levels based on ECCC's estimates of oil production, natural gas production, and LNG production for 2019, along with ECCC's estimates of the CER's Canada Net-Zero scenario are outlined in the table below.

Table 1: Production levels used to develop the proposed 2030 emissions cap (allowance levels) and legal upper bound (maximum allowable emissions)

	2019 Production Levels	**2030 Production Levels based on the CER's Canada Net Zero Forecast**
Total oil production (1000 barrels per day)	**4,400**	**5,153**
- Oil Sands (1000 barrels per day)	3,126	3,730
- Conventional oil (1000 barrels per day)	1,274	1,423
Natural gas production (petajoules per year)	**7,470**	**7,845**
LNG production (billion cubic feet per day)	**0**	**3.91**

Technically achievable emission reductions were estimated based on an assessment of the abatement technologies that can feasibly be deployed within the sector by 2030, considering the status of available technologies, the availability of equipment and labour, as well as timelines for permitting and approvals. The estimates were informed by information from industry and other interested parties.

To construct the bottom-up estimates for the 2030 emissions cap and legal upper bound, a conservative 2030 baseline emissions level was estimated by assuming 2019 emissions intensities remain constant for the given

production level. The technically achievable emissions reductions were then subtracted from the resulting GHG emissions level.

Table 2: Estimates of baseline GHG emissions, technically achievable GHG emissions reductions, 2030 emissions cap and legal upper bound (Mt CO_2e)

	2019 Production Levels Scenario	**CER Canada Net-Zero Production Scenario**
2030 GHG baseline emissions (total emissions without abatement)	174	199
Technically achievable emissions reductions		
Oil Sands	-20	-20
Conventional oil	-1	-2
Natural Gas Production & Processing	-6	-6
LNG	0	-1
Methane (all sub-sectors)	-33	-37
Total estimated 2030 GHG emissions (with abatement)	**114**	**134**
The 2030 emissions cap and legal upper bound	**The 2030 emissions cap:** in the range of **106 to 112** *	**2030 legal upper bound:** in the range of **131 to 137 ******

* The allowance level was set at a level slightly below the estimated GHG emissions with abatement for the 2019 Production Levels Scenario.
**Includes allowances and use of compliance flexibility units.

The main emissions reductions technologies assumed to be deployed in the 2030 estimates of technically achievable emissions reductions include:

- Oil sands: carbon capture and storage (CCS) and solvents, with some emissions reductions from other abatement opportunities such as increased efficiency (20 Mt)
- Conventional oil: reduced flaring (1-2 Mt).
- Natural gas production and processing: CCS and electrification (6 Mt).
- LNG: electrification in later stage projects.
- Methane (all subsectors): emissions reductions are assumed to achieve the 75% target for the enhanced methane regulations (33Mt).