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Aligning Canada's oil and gas sector with net zero

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In July 2022, the federal government released its discussion paper on the proposed oil and gas cap, *Options to Cap and Cut Oil and Gas Sector Greenhouse Gas Emissions to Achieve 2030 Goals and Net-Zero by 2050* (Environment and Climate Change Canada [ECCC] 2022a). The following paper represents our response to the discussion paper and our general vision for a cap on Scope 1 and 2 oil and gas greenhouse gas emissions.

Executive summary

Canada's oil and gas sector faces unique challenges aligning with net zero. Emissions in the oil and gas sector are out of sync with a net zero pathway—making it more difficult for Canada to meet its emissions reduction targets and putting more pressure on other sectors. Critically, long-term uncertainty over the global demand for oil and gas risks increasing the costs of Canada's net zero transition overall, given possible emissions "lock-in" as well as stranded oil and gas assets and the unfunded environmental liabilities associated with them. This uncertainty and the risk of inertia it creates is a tangible problem—especially considering the importance of the sector for Canada's emissions profile and economy—that justifies a targeted approach even though it creates additional complications.

The two options proposed by the federal government in their discussion paper are more similar than different. Each option faces some challenges, but both can—if designed well—achieve the government's ultimate goal of cutting emissions in the sector "at a pace and scale needed to reach net zero by 2050." The key challenge for both options is speed.

Ultimately, specific design and implementation details might matter more than the choice of policy instrument. Implementation challenges for each option can and should be addressed. For each policy option, smart design choices can make them more effective at achieving emis-

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sions reductions, more cost-effective, easier to implement, simpler for firms to comply with, and less likely to produce adverse policy interactions.

If the federal government pursues Option 1 (a sector-specific cap-and-trade system), it should simplify the overall policy package that the sector faces. Developing a new pricing system risks adding complexity, both for regulated entities and for the government, leading to delays. Under this option, the government should therefore: 1) exempt covered oil and gas firms from the existing Output-Based Pricing System (OBPS) to avoid regulatory layering or "pancaking"; 2) leverage design elements from the federal OBPS to expedite the implementation of the system; 3) introduce a price floor and ceiling to address potential price volatility under the cap-and-trade system; 4) allow small firms to opt-in to the cap in order to minimize monitoring and enforcement complexity; and 5) exclude fugitive methane emissions from the cap until they can be properly measured, while simultaneously strengthening federal methane regulations in order to achieve "near zero" emissions and to maximize low-cost emissions reductions.

If the federal government pursues Option 2 (a modified output-based pricing system for the oil and gas sector) it should drive a sectoral emissions pathway without unduly disrupting existing policy. The federal OBPS remains a critical element of Canada's *Emissions Reduction Plan* (ECCC 2022b), with relatively broad support. Under this option, the government should therefore: 1) implement a modified output-based pricing system for the oil and gas sector in order to avoid large differences in carbon prices across sectors by, as much as possible, strengthening emissions intensity thresholds instead of raising the sectoral carbon price; 2) dynamically adjust the policy stringency over time so as to keep the sector on an emissions pathway consistent with net zero; 3) prioritize establishing border carbon adjustments and phasing-out output-based support to industry; and 4) aggressively tighten methane regulations to ensure more low-cost fugitive emissions reductions are achieved, reducing the need for higher stringency in the modified OBPS for the oil and gas sector.

Strong policy for fugitive methane emissions is critical. Regardless of the option chosen, methane regulations should be strengthened—with the objective of "near zero" emissions—and policy should be developed to allow for fugitive methane emissions to be explicitly priced once those emissions can be more precisely measured. These emissions reductions are generally low cost. And given the United States' new regulations to aggressively limit these emissions, strong policy will not create competitiveness pressures.

Option 1 might represent a more practical path forward, despite its challenges. While both options have their pitfalls, implementing Option 1 may be faster and less disruptive. With that said, which option is preferable will depend on how successfully each option could be implemented and optimized in practice. Either approach can work, and ultimately getting the details right will be the key to success.

1. Introduction

During the Glasgow COP26 summit in November 2021, the Canadian government committed to cap and cut greenhouse gas emissions from the oil and gas sector. This followed a 2021 federal election promise outlined in the Liberal Party platform which explained that the cap would not exceed current pollution levels, would be accompanied by five-year emissions targets until 2050, and would include milestones for emission reductions in 2025 and 2030 based on the advice of the Net-Zero Advisory Body (Liberal Party of Canada 2021). Clarifying the ultimate objective of the policy, Prime Minister Trudeau explained that a declining cap would be implemented "at a pace and scale needed to reach net zero by 2050" while Minister of Environment and Climate Change Steven Guilbeault stated that the cap would not seek to reduce production in the sector (Tasker 2021).

In a discussion paper released in July 2022, the federal government presented two policy options for an oil and gas cap, which they committed to implement in 2023. The paper also raises a series of questions about the principles, design, scope, and implementation of the policy.

This scoping paper presents our advice for how the federal government can design and quickly implement a policy that can put Canada's oil and gas sector on a low-cost net zero pathway.[1] First, it seeks to better articulate the policy problem: why a new policy approach is needed to tackle the oil and gas sector's greenhouse gas emissions. Second, it summarizes the main trade-offs and implications of the two policy options proposed in the discussion paper. Third, it provides advice on how to optimally design each of the two options. Finally, it summarizes our advice to the federal government on the implementation of an oil and gas cap.

2. Problem definition

Several policies to reduce greenhouse gas emissions already apply to the oil and gas sector, including carbon pricing (see Annex 1). Yet the federal government has called for additional policy. What problem—or problems—is the new oil and gas cap seeking to solve?

Three main factors combine to justify a new policy approach for the oil and gas sector:

1. The oil and gas sector is out of sync with its net zero pathway—making it more difficult for Canada to meet its emissions reduction targets

Existing federal and provincial climate policies (i.e., excluding the proposed oil and gas cap) are insufficient to deliver emissions reductions to meet Canada's 2030 target. In order to achieve the target, more stringent policies will be required. And as the biggest contributor to Canada's emissions, the oil and gas sector must be a central focus for these policies (Sawyer and Beugin 2022).

[1] This report evaluates a cap on Scope 1 and 2 emissions in the oil and gas sector, not a cap on production.

If Canada is to meet its 2030 emissions reduction target, a rapid decline in Scope 1 and 2 emissions in the oil and gas sector is essential.

Scope 1 and 2 emissions from the Canadian oil and gas sector continue to rise, even as other economic sectors are significantly decarbonizing. Between 2005 and 2019, emissions in the electricity, waste, and heavy industry sectors declined by 73 megatonnes (Mt) CO_2 equivalent (e)—equal to a 10 per cent reduction from Canada's 2005 emissions baseline. During the same period, emissions from oil and gas rose by 31 Mt CO_2e and transportation sector emissions increased by 26 Mt CO_2e for a total of 57 Mt CO_2e , almost entirely offsetting the decarbonization gains in other sectors' emissions projections for 2030 (ECCC 2022b). In the latest reference case (which encompasses "all policies and measures funded, legislated and implemented by federal, provincial and territorial governments", oil and gas emissions are expected to stop rising, but will remain flat (ECCC 2022c).

If Canada is to meet its 2030 emissions reduction target of 40 to 45 per cent below 2005 levels by 2030 on a path to net zero by 2050, a rapid decline in Scope 1 and 2 emissions in the oil and gas sector is essential. Projections in Canada's 2030 *Emissions Reduction Plan* suggest that emissions levels in the oil and gas sector of around 110 Mt CO_2e per year in 2030 (i.e., a reduction of 31 per cent below 2005 levels by 2030) are consistent with a least-cost path to achieve Canada's nationally determined contribution to the Paris Agreement (ECCC 2022b).

If oil and gas emissions continue to rise or remain flat, other sectors would have to make up the difference and drive even deeper emissions reductions for Canada to achieve its 2030 target and net zero by 2050 (ECCC 2022b). At the extreme, this kind of emissions pathway for the sector could cause Canada to fail to meet its targets altogether.

2. Current policies aren't delivering sufficient emissions reductions

Existing climate policies (see Annex 1) that apply to Canada's oil and gas sector are not working to their full potential. In particular:

A surplus of credits is at risk of developing in output-based pricing systems, which will undermine incentives to reduce greenhouse gas emissions. Output-based pricing is designed to lower costs of emission reductions to address concerns around competitiveness and leakage (in other words, investment, production, and emissions shifting to jurisdictions with weaker climate policy). It does so by establishing emissions-intensity thresholds. Instead of subjecting firms to the full carbon price, they only pay for emissions that exceed the threshold. At the same time, it maintains incentives for firms to improve emissions performance because they can generate additional credits by reducing emissions beyond the threshold. However, this incentive is significantly weakened if demand does not exist for those credits. If too many firms can meet the inten-

sity threshold or can purchase additional offsets from outside of the sector, the trading price for credits falls and incentives to reduce emissions are diluted. Provincial systems—particularly those with substantial oil and gas sectors—and the federal OBPS are at risk of experiencing this problem (Sawyer et al. 2021). Additional public subsidies (for example, the proposed carbon capture, utilization, and storage [CCUS] investment tax credit) could exacerbate this risk by making it easier for firms to achieve emissions intensity thresholds and reducing demand for credits.

Uncertainty regarding the durability of carbon pricing is undermining the incentives to reduce emissions, especially in long-lived, capital-intensive projects such as those in oil and gas (Beugin and Shaffer 2021). Firms worry that future governments might not implement carbon pricing increases as planned and that the price of carbon in 2030 will be less than $170 per tonne. Beyond 2030, when many long-term projects will continue to operate, there is even greater uncertainty with respect to the carbon price. As a result, large emissions-reducing projects (such as CCUS projects in the oil and gas sector) are not moving forward, even though they would be economically viable under a high carbon price (for as long as international demand for the product persists).

Federal and provincial methane regulations are insufficiently stringent and provide inadequate coverage—leaving low-cost emissions reductions unrealized (Bataille 2022). Moreover, total methane emissions are almost certainly being undercounted, with the International Energy Agency (IEA) estimating that methane emissions in the energy sector are 70 per cent higher than official reports (MacKay et al. 2021; Chan et al. 2020; IEA 2022). This presents a significant risk to climate stabilization efforts given that methane's heat-trapping potential is more than 80 times greater than CO_2 over a 20-year period (ECCC 2021). Finally, current methane regulations only cover emissions from active sites, which excludes orphaned and abandoned wells that make up an estimated five to eight per cent of total methane emissions according to one study (Kang et al. 2016). Stronger methane regulations, with the objective of achieving "near zero" methane emissions, are therefore a crucial component of Canada's net zero transition, and Canada should be looking to emulate the recently strengthened methane regulations in the United States to achieve that objective.

The new clean fuel regulations will likely have a smaller impact on emissions than initially expected. Largely because gaseous fuels were excluded in the final version of the regulations, a recently released impact assessment estimated that the federal Clean Fuel Standard will result in emissions reductions of 18 Mt CO_2e in 2030, 12 Mt CO_2e lower than 2018 projections, before declining to 9.5 Mt CO_2e per year in 2040 (ECCC 2022d; ECCC 2018). With that said, it is important to acknowledge that the clean fuel regulations play an important role in effectively subsidizing cleaner sources of fuel and growing Canada's clean energy industry (Jaccard 2020).

Overall, our independent analysis of Canada's *Emissions Reduction Plan* indicates in its reference case scenario (i.e., the emissions trajectory absent additional measures) that oil and gas emissions would actually still be four per cent above 2005 levels by 2030. That would be far short of the federal

government's economically efficient pathway for the sector of a reduction in emissions of 31 per cent below 2005 levels. Our independent analysis affirms that putting the sector on a net zero pathway requires an oil and gas emissions cap and other policies that are designed with sufficient stringency and are implemented quickly (Sawyer et al. 2022).

3. Uncertainty around long-term global oil and gas demand risks raising the cost of Canada's net zero transition

In the short run, global demand for oil and gas remains high, especially in the face of Russia's illegal invasion of Ukraine. That doesn't, however, change the imperative to reduce greenhouse gas emissions. In the near term, therefore, continued oil and gas production with lower production emissions is the compromise that was reached and continues to apply in Canada and among other countries, reconciling short-term needs and long-term trends. Canadian climate policy is consistent with this goal: carbon pricing, regulations, and subsidies (for example, for CCUS) create incentives for reducing emissions generated by oil and gas production. Output-based carbon pricing avoids creating incentives for firms to reduce emissions by cutting production (which would be replaced by production in other jurisdictions).

Yet oil and gas is different from other emissions-intensive and trade-exposed industries because long-term global demand for these projects will decline as global efforts to reduce greenhouse gas emissions accelerate. In fact, the IEA projects in its net zero scenario that global oil demand will decline 75 per cent by 2050, that gas demand will be 55 per cent lower, and that no new oil and gas fields should be developed (IEA 2021a). While the exact timing of that transition remains uncertain, it has already begun, and shifts in technology, markets, and policy in jurisdictions across the global economy are underway, with dramatic consequences for the oil and gas sector (Samson et al. 2021; Bond 2022).

But the uncertainty of that timing creates a challenge for investment planning. In the face of this challenge, some firms in the oil and gas industry are planning for continued long-term demand. Doing so creates two kinds of risks.

First, it creates risks of stranded assets once demand does decline. One estimate suggests that Canada could have as much as US$100 billion in physical stranded fossil fuel assets as a result of the global low-carbon transition (Semieniuk et al. 2022). The costs of those stranded assets are private: they are borne by project investors. Yet, they also have implications for policy, because they create incentives for those project proponents to lobby for less stringent climate policy and/or compensation for the cost of those policies—potentially undermining Canada's overall climate objectives.

Simultaneously, the environmental liabilities of oil and gas assets, namely tailings ponds and the cost of cleaning up orphaned wells, are at risk of being increasingly socialized—leaving taxpayers to foot the bill and front-line, often Indigenous, communities bearing disproportionate costs. Liability gaps in laws and regulations governing the sector undermine incentives for firms to

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ensure old wells are not leaking methane (Canada's Ecofiscal Commission 2018; Dachis et al. 2017). And the problem is potentially worse for oil sands tailings. Internal estimates from the Alberta Energy Regulator indicate that the price for cleaning up Alberta's oil patch could be as high as $260 billion and much of the cost could ultimately be borne by the public (De Souza et al. 2018).

Second, uncertainty around long-term demand for oil and gas also creates risks of emissions "lock-in." Large, capital-intensive, and high-carbon projects, once built, are likely to continue operating for decades, even if market conditions change. Capital costs are sunk costs—and so production will tend to continue as long as revenues exceed operating costs, even if the project is an unprofitable investment overall.

Uncertainty around long-term oil and gas demand and prices risks creating more inertia and path-dependency in Canada's oil and gas sector, with a short-term expansion in production making it harder and more expensive to deliver on Canada's climate goals, and without necessarily generating economic value. As we noted above, higher emissions in the oil and gas sector would require *other* sectors to carry a greater burden in contributing to Canada's emissions targets. This would mean that the larger costs of decisions taken in the oil and gas sector would fall on Canada broadly rather than on the oil and gas sector alone. And if other sectors were unable to deliver deep enough emissions reductions, Canada would fail to meet its emissions targets altogether.

Putting it all together: Why we need a new policy approach to address emissions in the oil and gas sector

Overall, oil and gas emissions are not on a pathway consistent with a net zero transition. Current policies are not sufficiently stringent to align with Canada's 2030 emissions target and net zero by 2050. And long-term uncertainty over the global demand for oil and gas contributes to inertia that risks raising the costs of Canada meeting its climate goals. At the extreme, it risks even sending Canada down dead-end pathways that put reaching net zero by 2050 in jeopardy (Net-Zero Advisory Body 2021).

The combination of these factors suggest that a revised policy approach for oil and gas sector emissions is needed. Policy that provides greater certainty about an emissions pathway for the oil and gas sector can help address long-term uncertainty about global oil and gas demand while also making Canada's overall net zero emissions pathway more cost-effective and attainable. That may create tension with the idea of cost-effective policy applying a consistent price signal across

all sectors (see Box 1). But uncertainty and the risk of inertia it creates is a tangible problem—especially considering the importance of the sector for Canada's emissions profile and economy—that justifies a targeted approach even though it creates additional complications.

3. Comparing the two policy options

The federal discussion paper articulates two policy options for implementing a policy that can put the sector on an emissions pathway consistent with a cost-effective economy-wide transition to net zero:

1. **A new cap-and-trade system under the *Canadian Environmental Protection Act*.** Under this option, a new cap-and-trade system would complement output-based pricing systems in the oil and gas sector by filling the gap between the emissions reductions induced by existing policies and the sector's net zero pathway. Put another way, this new policy would act as a top-up so that if these policies are expected to produce a decline in emissions of 40 Mt CO_2e in 2030, for instance, the cap would be set at a level that would produce an additional 44 Mt CO_2e in reductions to reduce total emissions in the sector by 84 Mt CO_2e , as the 2030 *Emissions Reduction Plan* prescribes.

2. **Modification of the current carbon pricing approach under the *Greenhouse Gas Pollution Pricing Act*.** This second choice proposes that the federal government increase the minimum price of carbon in the oil and gas sector *above* the amounts defined in the existing schedule. A higher carbon price that escalates more rapidly would drive additional emissions reductions in jurisdictions covered by the federal OBPS. Provinces and territories with their own output-based pricing systems would be required to follow suit or fall under the federal system instead. The federal government could also strengthen oil and gas emissions intensity benchmarks.

BOX 1:

The case for strengthening output-based pricing economy-wide

Amending carbon pricing solely for the oil and gas sector or adopting a sectoral cap-and-trade system to achieve the objectives of a cap on oil and gas emissions could result in differential carbon prices across the economy, which could undermine a distinct benefit of carbon pricing: that it delivers the lowest-cost emissions reductions by providing a consistent incentive. A potential alternative approach is that the federal government could strengthen the minimum price on carbon and/or emissions intensity standards throughout the economy, including in the oil and gas sector, which could drive more cost-effective emissions reductions across sectors (Leach 2022; Winter 2022).

Under a strengthened, economy-wide output-based pricing system, emphasis could be placed on increasing the stringency of output-based pricing while simultaneously minimizing the differential carbon prices that currently exist across provincial, territorial, and federal carbon pricing systems. Our 2021 report *The State of Carbon Pricing in Canada* illustrated that the marginal cost incentive, or the value of reducing emissions by one tonne, ranged across jurisdictions from as low as $16 to as high as $41 in 2020 (Sawyer et al. 2021). Applying the changes the government proposed for the oil and gas sector in Option 2 to output-based pricing in all economic sectors, while pursuing closer harmonization of carbon pricing across the country, could make meeting Canada's climate goals as cost-effective as possible.

This approach has the advantage of addressing emissions in other sectors, too—making further progress in meeting Canada's international climate commitments. However, its biggest drawback is that it raises the carbon price and/or average costs for firms in sectors that have already significantly reduced their emissions. Moreover, as an economy-wide price-based approach, it does not address the uncertainty—and the risk of inertia it creates—that is inherent to the oil and gas sector specifically. That reduces the certainty that emissions reductions specifically in the oil and gas sector would be consistent with the pathway of a cost-effective economy-wide transition to net zero.

The goal of the emissions cap should not be to guarantee a precise quantity of emissions, but to align the sector's emissions reductions with its net zero pathway. That goal could be effectively achieved with either policy option.

While the federal discussion paper describes these options in detail and also considers trade-offs across them, this section summarizes—and extends—that discussion. Ultimately, we find that the two options are more similar than different. Key differences, however, highlight unique design and implementation challenges for each.

We consider both options across five evaluation criteria: effectiveness in reducing greenhouse gas emissions, cost-effectiveness, ease of implementation, compliance complexity for firms, and avoiding adverse policy interactions:

1. Effectiveness in reducing greenhouse gas emissions

The stated goal of the emissions cap is to deliver emissions reductions in the oil and gas sector consistent with the sector's pathway to the 2030 target, as outlined in the *Emissions Reduction Plan*, and with achieving net zero by 2050.

Both of the options outlined in the federal discussion paper could deliver the additional emissions reductions required and would do so by imposing a higher total carbon price on oil and gas emitters relative to emitters in the rest of the economy. In the case of Option 1, a cap-and-trade system, the sector's carbon price would emerge as the sum of the carbon price from output-based pricing systems and the price of tradable allocations under the cap. In the case of Option 2, a modified OBPS system, that price would be the oil and gas sector-specific carbon price.

The options differ subtly, however, with respect to the *certainty* of achieving the precise desired emissions reductions.

Option 1 provides greater certainty about the *quantity* of emissions allowed in the sector. It sets a finite number of allocations that decline over time, consistent with the sectoral net zero pathway. Still, any compliance flexibility—eligible offsets, for example—from beyond the sector begins to undermine the certainty and effectiveness in achieving emissions reductions in the oil and gas sector. For Option 2, offsets are already in place under the federal OBPS and equivalent output-based pricing systems.

Option 2, on the other hand, provides certainty about carbon prices, but not about levels of emissions. Modelling exercises might estimate what emissions reductions will follow from a given price trajectory, but the policy will not necessarily deliver those emissions levels in practice. Dynamically adjusting the policy over time, however, could introduce greater certainty regarding the quantity

of emissions. The government could, as some governments are already doing, adjust and calibrate the stringency of an output-based pricing system in the oil and gas sector over time to achieve its desired emissions reductions. For example, if emissions are not decreasing quickly enough to align with the sector's net zero pathway, the price of carbon could be increased more rapidly.

Option 1 more clearly guarantees a quantity of emissions. The price of allocations under the cap will automatically fluctuate as demand for oil and gas changes. High oil and gas prices incent firms to produce more, which also creates more emissions, thus automatically increasing the price of allocations. Conversely, as global oil and gas demand declines over time, the price of allocations under the cap will decrease. But the total quantity of emissions will remain in line with the sector's net zero pathway.

Nevertheless, the goal of the emissions cap should not be to guarantee a precise quantity of emissions, but to align the sector's emissions reductions with its net zero pathway. That goal could be effectively achieved with either policy option.

Finally, the long-term effectiveness of a policy also depends on its durability (i.e., the extent to which it will be robust to changes in government). Neither option is more durable than the other as they both could be effectively cancelled after a change in government and thereby have little to no effect on emissions in the sector. For Option 1, the entire cap can be repealed through new regulations. Option 2 could not be fully repealed without legislative changes, but implementing regulations are necessary for it to effectively function, meaning that it can also be substantially repealed through a change to its regulations.

2. Cost-effectiveness

All else being equal, governments should choose a policy option that minimizes the overall costs of achieving the required emissions reductions in the sector. A policy that establishes consistent incentives to reduce emissions across firms within the oil and gas sector (as well as across other sectors) will be more cost-effective. Options that create relatively strong incentives for some emitters and weak incentives for others will tend to drive more high-cost emissions reductions while also leaving low-cost emissions abatement unrealized.

Again, both options are more similar than different when it comes to their cost-effectiveness.

Both rely on a market-based approach, which means that costs within the sector would be least-cost. Whether the price is established by a market for allocations in a cap-and-trade system or directly under a strengthened oil and gas sector-specific carbon price is mostly immaterial.

However, both options will likely lead to a higher carbon price for oil and gas firms relative to *other sectors*. If this were the case, an asymmetric carbon price could drive more expensive emissions reductions in the oil and gas sector relative to emissions reductions elsewhere in the economy. This could raise the overall costs for Canada to meet its internationally obligated climate goals.

3. Ease of implementation

2030 is less than eight years away and the reductions required are significant, so implementing policies quickly and simply is critical. This criterion considers the extent to which:

- the policy option will be time-consuming to properly design (policies that are relatively unique can be expected to take longer to implement);
- there are significant administrative costs and burdens for the government to implement the policy;
- legislative changes will be needed for it to take effect or if it can be implemented using regulations under existing statutes; and
- the system is compatible with climate federalism and shared jurisdiction between federal, provincial, and territorial governments.

Both options face implementation challenges. Some issues are common across both options, while others are unique to each.

Both options will face difficulties with respect to measurement of emissions, especially for smaller emitters in the sector, that will make them harder to adequately design. Under the current policy approach, smaller emitters do not measure their emissions and are generally not included under output-based pricing systems. Methane emissions—for example fugitive emissions or emissions from small wells, some of which are no longer in operation—will be particularly challenging to measure and thus to include under the cap. Nevertheless, both options seek to regulate a broader set of emissions in the sector, not just large emitters.

Creating a new cap-and-trade system (Option 1) will take time, given the complexity of such systems. The more engagement with stakeholders and emitters required, the more complicated implementation is likely to be. This new scheme could borrow some elements from Quebec's and Nova Scotia's cap-and-trade systems (or international schemes such as the European Union's), but it is still a unique sectoral approach without an analogue in Canadian climate policy, so designing this policy could prove costly and time-consuming.

Adapting output-based carbon pricing (Option 2) has some key implementation advantages given that the large emitter programs already exist, the reporting mechanisms for compliance are already in place, and the federal government already has a process in place for engaging provinces and territories on the future course of the OBPS and equivalent large emitter programs. However, unlike Option 1, which can be implemented through new regulations under the CEPA, legislative changes to the Greenhouse Gas Pollution Pricing Act would be necessary to implement Option 2. In addition, for Option 2 to function properly and deliver the desired emissions reductions in the sector, the carbon price and/or the emissions intensity thresholds for oil and gas will need to be more frequently adjusted over time.

Full implementation of a modified OBPS under Option 2 would require not only developing but enforcing a new federal minimum standard. Currently, the systems in place to regulate large emitters in Alberta, Saskatchewan, and British Columbia—major hubs for oil and gas production—are provincial and, therefore, firms are not fully subject to the federal OBPS. Negotiations around provincial equivalency are likely to be complex and possibly slow. They may also undermine current intergovernmental negotiations and potentially damage the relative stability and broad support that exists for output-based pricing across the country. With that said, engagement with the provinces and territories will also be necessary to implement Option 1.

Climate federalism creates different implications for the relative expediency and ultimate effectiveness of the two options. Regarding Option 1, the Canadian *Environmental Protection Act* provides a regulatory authority for the federal government. For Option 2, establishing a sector-specific carbon price may not be consistent with the Supreme Court's ruling on the *Greenhouse Gas Pollution Pricing Act*, which confirmed that the federal government could set minimum national carbon pricing standards because it took a broad approach that did not discriminate based on sector. In either case though, policy implementation will necessitate new discussions with provinces.

4. Compliance complexity for firms

Compliance complexity refers to the administrative and transaction costs of compliance for regulated firms. Ideally, the policy would minimize the transaction costs imposed on oil and gas firms.

Trade-offs with respect to compliance costs are more clear-cut across the two options. Under a new cap on emissions (Option 1), oil and gas firms would be compelled to comply with a new, additional system. This would present additional administrative costs that would make compliance more burdensome.

Alternatively, adapting the existing system and working within the confines of existing policies (Option 2) would save both firms and government regulators time and money. Firms in the oil and gas sector are already complying with current output-based pricing systems—presenting no new transaction costs.

5. Avoiding adverse policy interactions

Interactions with existing policies that regulate the oil and gas sector's emissions could affect the cost-effectiveness of other policies, render other policies redundant, be harder to design and calibrate because of existing policy, and/or layer additional compliance burdens on top of those created by existing carbon pricing systems and regulations.

By design, Option 1 only builds upon existing policies when those policies are failing to drive adequate emissions abatement in the oil and gas sector. If output-based pricing and other regulations reduce emissions in line with the sector's net zero pathway, the cap would simply equal sectoral emissions and the price of allowances would be zero (i.e., the system would not constrain emissions). But in the event of insufficient stringency, the quantity-based cap would

bind sectoral emissions and drive up the price of carbon in the sector through more expensive cap-and-trade system allowances.

Option 2 would result in even more limited interaction effects with other policies as it does not introduce a new policy scheme. In fact, it could address some of the challenges that existing policies present, depending on how it is designed (see Section 5.2). For instance, the forthcoming CCUS tax credit risks oversaturating the carbon credits market in the long term, as CCUS facilities generate credits for performing better than the emissions intensity benchmarks under output-based pricing. This decreases the demand for credits (and thereby, their price), reducing the incentive to decarbonize. Strengthening the emissions intensity standards in addition to increasing the price on carbon in the oil and gas sector would reduce the number of credits firms can generate, to account for the effects of the CCUS tax credit.

Additionally, implementing a modified OBPS for the oil and gas sector would necessitate a recalibration of the emissions intensity thresholds for other sectors, in collaboration with the provinces and territories. With that said, a recalibration is likely a necessity regardless, in order to mitigate the existing risk of oversupply in the OBPS credit market.

Summary

As Table 1 illustrates, both options have subtle advantages and disadvantages:

	Option 1 (Cap-and-trade)	Option 2 (Modified OBPS)
Effectiveness in reducing emissions	**Effective:** Likely able to reduce emissions in line with the sector's net zero pathway (depending on compliance flexibility) **Certain:** High chance that a precise quantity of emissions can be achieved (depending on compliance options)	**Effective:** Likely able to reduce emissions in line with the sector's net zero pathway (depending on compliance flexibility) **Somewhat certain:** The output-based carbon pricing system provides certainty regarding the price of carbon rather than the quantity of emissions (depending on how stringency is updated over time)
Cost-effectiveness	**Cost-effective** within the sector **Potentially cost ineffective** across sectors, depending on misalignment of carbon prices across sectors	**Cost-effective** within the sector **Potentially cost ineffective** across sectors, depending on misalignment of carbon prices across sectors
Ease of implementation	**Challenging:** New policy architecture would be required	**Challenging:** Current adjustments to OBPS are already underway. Amendments to the Greenhouse Gas Pollution Pricing Act would be required to create a sectoral carbon price
Compliance complexity for firms	**Moderately complex:** Introduces a new compliance regime for industry on top of the existing one (but one that requires similar knowledge and capacities)	**Simple:** Leverages existing policy
Avoiding adverse interactions	**Little risk of adverse interactions:** A cap-and-trade will backstop existing policies and help compensate for their deficiencies	**Little to no risk of adverse interactions:** Amending the OBPS will require fixing problems with existing policies, but ones that should be fixed in any case

Choosing among the two options that the federal government has presented depends on which evaluation criteria the government weigh most heavily. If, for example, certainty of emissions reductions is most important, Option 1 better provides that certainty. If on the other hand, the oil industry's concerns around complexity and transaction costs are most critical, Option 2 can better assuage those fears.

Moreover, the details of how each option is implemented and designed can partially address the disadvantages of each system. The subsequent section explores the critical design and implementation choices for each option. As we will show, each option has unique challenges which will complicate its implementation.

4. Strengthening the design of Option 1 (cap-and-trade)

The biggest challenges for the federal government's cap-and-trade option are the interconnected issues of expediency and complexity. Creating a new sectoral carbon pricing system will take time, especially if the process of doing so requires extensive engagement and consultation with stakeholders. Given the steep emissions reduction path required between now and 2030, time is not a luxury the government can afford. At the same time, more complexity in design will also increase transaction costs for regulated firms.

Design details should therefore seek to address these concerns. In particular, if the federal government pursues this option, it should take the following approach:

1. Avoid multiple layers of compliance

Instead of layering the oil and gas-specific cap-and-trade scheme on top of the multiple output-based pricing systems across the country as the federal discussion paper proposes, the oil and gas sector could be exempted from output-based pricing, with the cap-and-trade system alone setting the carbon price for the sector (but under an approach that still has provisions to protect trade-exposed industries; see Section 4.2).

This approach reduces the transaction costs for firms in the sector, as they would only have to comply with one carbon pricing scheme. It would also help to ameliorate the potential issue of the CCUS tax credit oversaturating carbon credit markets and undermining the carbon pricing regime, as the oil and gas sector would no longer be subject to output-based pricing. Meanwhile, this approach would be just as effective at driving emissions reductions with the same amount of certainty as the version of Option 1 proposed by the federal government.

There are, however, two drawbacks to this approach. First, if the federal government is seeking to pursue contracts for difference (Beugin and Shaffer 2022), this will be harder under a cap-and-trade system, which guarantees a quantity of emissions rather than a specific carbon price, though setting a price floor could resolve this issue. Second, exempting the oil and gas sector from output-based pricing will necessitate a recalibration of emissions intensity thresh-

olds under the OBPS in other sectors, in collaboration with the provinces and territories (though a recalibration is likely needed in any case given the existing risk of carbon credit oversupply).

2. Leverage the design of the existing federal Output-Based Pricing System to expedite implementation

As the federal discussion paper acknowledges, existing OBPS elements can be leveraged in the creation of this cap-and-trade scheme. This is particularly the case for permit allocation, as output-based allocations can help address competitiveness pressures and leakage.

Undertaking a time-consuming process of developing new rules for allocating permits is unnecessary when already-negotiated thresholds can be used as the starting point, to simplify the policy design and make implementation far easier and quicker. Other carbon pricing systems have similarly borrowed benchmarks from existing schemes to simplify the design and expedite implementation. For instance, the Netherlands introduced a carbon tax last year which uses the benchmarks from the European Union's Emissions Trading System to determine which emissions are subject to its domestic tax (World Bank 2021).

If the government pursues Option 1, it should initially draw on the emissions intensity thresholds from the OBPS to set the share of allocations freely provided as an output subsidy to support competitiveness. Firms whose emissions exceed their free allocation would still have to purchase additional allowances to remain in compliance with the cap. Over time, both the total number of allocations and the proportion which are freely allocated should decrease (and be eliminated entirely with the introduction of border carbon adjustments; see Section 5.3).

3. Design the cap to limit the volatility of the price of carbon—even at the expense of certainty in emissions reductions

By subjecting the oil and gas sector to an entirely different carbon pricing system, Option 1 would create a separate, more isolated, and therefore much more volatile carbon market. For instance, if oil prices remain persistently high or rise further, demand for allowances would increase and raise the price of carbon high above its price in other sectors. Conversely, low oil prices or CCUS implementation could reduce the demand for allowances and lead to a lower price of carbon than elsewhere in the economy.

This volatility challenge might be difficult to address given the smaller number of participants in the market compared to the OBPS, but two specific design measures can help address it:

- A *price floor* that would set a minimum carbon price
- A *price ceiling* that would set a maximum carbon price

As acknowledged by the federal discussion paper, a price floor is effectively already in place through the federal minimum standard set by the *Greenhouse Gas Pollution Pricing Act*. However, since we recommend that output-based pricing no longer apply to the oil and gas

sector once a cap-and-trade system is implemented, the federal government could instead establish a price floor by committing to buy allowances from emitters at a fixed price. A price ceiling could be implemented by maintaining an emissions allowance reserve to be released if allowances are being traded above a certain price.

By incorporating these measures, cap allowances would not be able to trade for a price outside of the band set by the price floor and ceiling—lessening market volatility. Reducing volatility provides greater certainty for firms to invest in emissions abatement, and ensures that the carbon price in the sector is neither significantly higher than elsewhere, which would drive more expensive emissions reductions, nor so low that emissions reductions in line with the oil and gas sector's net zero pathway are not being realized.

Such an optimal price band would also reduce the certainty of achieving the exact *quantity* of emissions set by the cap, as allocations would not always be allowed to trade at the price the permit market dictates (though quantity certainty could be improved through careful calibration of the reserve margin). However, as we stated earlier, the ultimate goal of the cap should be to ensure that the oil and gas sector is aligned with its net zero emissions pathway, rather than achieving an *exact* level of emissions reductions. Addressing market volatility under the cap need not compromise that objective.

4. Limit compliance flexibility

Introducing compliance flexibility reduces certainty in achieving emissions abatement, and in the case of offsets, may even undermine effectiveness in reducing emissions in the oil and gas sector (Rivers et al. 2021). Providing significant compliance flexibility also complicates the design of the system and could delay its implementation.

Given the tradeoff between compliance flexibility and emissions reductions, we strongly suggest that compliance flexibility be limited to a very short period of time or not at all, and that the flexibility options are minimal.

The only form of compliance flexibility that we recommend including are offsets that would represent net negative emissions (i.e., permanent sequestration), restricted to engineered forms of sequestration like direct air capture. Unlike other sources of offsets, such as natural carbon removal, these offsets would be more guaranteed to be additional and permanent.

Creating incentives for direct air capture also has other societal benefits. It will help to develop and scale a key decarbonization "wild card" that leverages expertise and assets in the Canadian oil and gas sector while having the co-benefit of advancing CCUS technology (Canadian Climate Institute 2021). Canadian firms could become leaders in carbon storage—a new business line which would thrive in a low-carbon economy. Moreover, in the longer term, scaling up low-cost carbon removal will be essential and valuable in stabilizing the climate, especially as net negative global emissions will be required beyond 2050.

5. Broaden coverage to include (some) small emitters

There is value in including a greater number of small emitters within a sectoral cap-and-trade system: the more emitters covered by the system, the greater the emissions reductions at a lower overall cost. However, at a certain point, measuring the emissions for smaller firms ends up costing more than the benefits of their inclusion in the system.

In general, firms will often prefer to participate in the cap-and-trade system rather than not, even if the price of carbon under such a system is higher than the fuel charge to which they are otherwise subject. Firms in the cap-and-trade system will be eligible for output-based allocations, which will lower the average cost of compliance. Therefore, either allowing firms to self-select into cap-and-trade or establishing a system to opt-in to it would likely expand the inclusion of small emitters, while excluding those emitters for whom the measurement and quantification of emissions would be too costly.

6. Exclude fugitive methane emissions from the cap until they can be measured directly, but aggressively tighten methane regulations in the interim

Measuring and monitoring technologies for fugitive methane emissions are improving, but until they can be directly, precisely, and cost-effectively measured (potentially by satellite), it does not make sense to include them in an oil and gas cap-and-trade system. However, methane emissions from flaring and venting can be easily measured today and should be included in the cap.

To expedite the process of including fugitive methane emissions within the sectoral cap-and-trade system, the federal government could build a methane monitoring program (potentially collaborating with provinces and territories) which would make methane emissions measurement, and ultimately pricing, possible.

Until fugitive methane emissions can be included in the cap-and-trade system, the federal government should aggressively and rapidly tighten its methane regulations to drive essential methane emissions reductions in the interim, with the objective of achieving "near zero" methane emissions. For instance, the government could raise its ambition from a 75 per cent reduction in methane emissions compared to 2012 levels by 2030 to 90 per cent, while closely coordinating with and adopting best practices from the United States, which has strengthened its methane regulations through the recently passed Inflation Reduction Act.[2]

It is also important to note that methane emissions reductions are essential for ensuring that blue hydrogen projects, which are integral new business lines for oil and gas firms, are viable and consistent with a net zero future. Rapidly reducing methane emissions is therefore good for the climate and industry alike.

[2] The Inflation Reduction Act of 2022 calls for a methane fee for firms that emit more than 25,000 tonnes of CO_2e to be set at a level of USD$1,500/CAD$1,925 per tonne (equal to USD$60/CAD$77 per tonne of CO_2e) by 2027. Additionally, it gives USD$1.5 billion to the Environmental Protection Agency to provide technical assistance to firms to measure and report methane emissions and help them deploy methane abatement equipment (Tamborrino et al. 2022).

Increasing the stringency of methane regulations also reduces the extent to which the carbon price in the oil and gas sector would exceed the price in other sectors.

5. Strengthening the design of Option 2 (modified Output-Based Pricing System)

Option 2 shares the key challenge of expediency, though in different ways than Option 1. Making changes to the federal OBPS for the oil and gas sector (or even across all large emitters—see Box 1) will be challenging because it requires either provincial and territorial participation or redefining the federal benchmark (i.e., the minimum standard) and the imposition of a new oil and gas sector-specific federal backstop. This presents significant legal risks that could delay implementation. Additionally, having to go through Parliament to implement this option represents a substantial hurdle that would slow implementation.

Design details should therefore seek to address these concerns, among others. In particular, if the federal government pursues this option, it should take the following approach:

1. Implement a modified Output-Based Pricing System by strengthening emissions intensity thresholds as much as possible

Strengthening emissions intensity thresholds and raising the carbon price for the oil and gas sector could both drive additional emissions reductions in the sector. However, an approach that focuses on increasing the stringency of the emissions thresholds has several advantages. Strengthening emissions intensity thresholds would be easier and faster to implement than raising the sectoral carbon price as it would not require amendments to the *Greenhouse Gas Pollution Pricing Act*. Avoiding large increases in the sector-specific carbon price would also reduce the challenges—whether legal or economic—of asymmetric carbon prices across sectors.

Emissions intensity thresholds under the OBPS are in need of adjustment regardless, as they are presently too lenient. While changes to the thresholds would increase the average cost of carbon for firms, thus increasing leakage and competitiveness pressures, it would also ensure that markets for OBPS credits are liquid, thus maintaining the marginal price of carbon. Strengthening the thresholds would increase demand for credits and decrease the supply of excess credits, helping to address the risk of their oversupply undermining decarbonization incentives.

2. Dynamically adjust the modified Output-Based Pricing System over time to improve certainty of achieving emissions reductions

The Output-Based Pricing System as currently designed establishes certainty with respect to the *price* of carbon rather than the *quantity* of emissions. For Option 2 to deliver an emissions pathway in the sector aligned with net zero, the carbon price and/or the emissions intensity thresholds for oil and gas

must be adjusted over time. The government should track emissions in the sector and increase (or decrease) the stringency of the OBPS if actual emissions vary too much from the net zero pathway.

3. Prioritize border carbon adjustments and phase out output-based pricing if they come into play

Output-based pricing is designed to create incentives for emissions reductions while mitigating carbon leakage and competitiveness pressures for emissions-intensive and trade-exposed industries. However, if Canada implements border carbon adjustments—alongside major trading partners—output-based pricing becomes largely unnecessary.[3] Instead, the full carbon price could be applied to regulated firms, as there would be little risk of it causing leakage or competitiveness pressures.

Border carbon adjustments would protect the competitiveness of Canadian industry— including oil and gas—even if it faced higher average carbon costs. Doing so would create stronger incentives for structural change in the energy sector without leading to leakage of emissions or competitiveness pressures.

Implementing border carbon adjustments would also affect the proposed cap-and-trade system in Option 1. However, if or when border carbon adjustments are introduced, the only change that would be required under that option is that allowances would no longer be provided for free, as it would not be necessary to do so to protect firms from competitiveness pressures.

Allowances would be fully auctioned instead. Border carbon adjustments are desirable under both options, but especially so under a revised version of Option 2 that would focus on tightening emissions intensity thresholds, as this could increase leakage risks and competitiveness pressures. Border carbon adjustments are desirable under both options, but especially so under a revised version of Option 2 that would focus on tightening emissions-intensity thresholds, as this could increase leakage risks and competitiveness pressures.

4. Aggressively tighten methane regulations in parallel with output-based pricing

As with Option 1, tightening methane regulations will be essential to realizing significant emissions reductions in the oil and gas sector; the OBPS cannot bring the sector in alignment with its net zero pathway on its own.

There are few drawbacks to strengthening methane regulations. Methane emissions abatement is low-cost and, as previously mentioned, is necessary to make new business lines for oil and gas firms, such as blue hydrogen production, sustainable and economically viable (Bataille 2022).

Also previously mentioned, tightening methane regulations could improve cost-effectiveness across the economy as a whole. Deeper emissions reductions are likely to be low-cost because reducing methane leaks leaves more methane to be sold as natural gas (Gorski 2021; IEA 2021b; IEA 2021c).

Regardless of the option chosen, Canada should be looking to raise its ambition from a 75 per cent reduction in methane emissions compared to 2012 levels by 2030 to 90 per cent while emulating the United States' newly strengthened methane regulations.

6. Updated evaluation of the policy options

The preceding sections explore ways in which the performance of each of the options can be adjusted to better manage trade-offs. The table below summarizes the upshot of these design proposals:

	Option 1 (Cap-and-trade)	Option 2 (Modified OBPS)
Effectiveness in reducing emissions	**(++) Effective to highly effective:** Significantly improved through reducing compliance flexibility, by prioritizing and ultimately implementing border carbon adjustments, strengthening methane regulations, and reducing the volatility in the cap-and-trade system **(-) Certain:** Certainty slightly reduced by introducing a price floor/ceiling	**(++) Effective to highly effective:** Significantly improved by signalling that emissions intensity thresholds will strengthen over time and dynamically adjusting them. Also improved by strengthening methane regulations **(+) Somewhat certain:** Improved by dynamically adjusting the policy over time
Cost-effectiveness	**(=) Cost-effective (within the sector):** No change **(+) Potentially cost ineffective (across sectors):** Slightly improved by implementing a price ceiling and by strengthening methane regulations	**(=) Cost-effective (within the sector):** No change **(+) Potentially cost ineffective (across sectors):** Slightly improved by strengthening methane regulations and emissions intensity thresholds to reduce need to increase the carbon price
Ease of implementation	**(++) Challenging to moderately challenging:** Significant improvement by leveraging existing elements from the OBPS and allowing small firms to opt-in	**(++) Challenging to moderately challenging:** Significant improvement through strengthening emissions intensity thresholds (instead of creating a sectoral carbon price)
Compliance complexity for firms	**(++) Moderately complex to low complexity:** Significant improvement by avoiding multiple layers of compliance	**(=) Simple:** No change
Avoiding adverse interactions	**(+) Little risk of adverse interactions:** Slight improvement by not subjecting the oil and gas sector to output-based pricing systems	**(+) Little to no risk of adverse interactions:** Improvement through positive interaction created between strengthening emissions intensity thresholds and the CCUS tax credit

Note: (+) refers to a marginally better performance relative to the criterion when our design recommendations are incorporated, (++) refers to a significantly better performance relative to the criterion when our design recommendations are incorporated, (=) refers to no change compared to the government's proposed option, and (-) refers to a marginally worse relative to the criterion when our design recommendations are incorporated.

7. Conclusions

Overall, the two options for aligning oil and gas with a net zero pathway are more similar than they are different. Particularly when the design elements we have suggested in this report are incorporated, both options improve the certainty that the sector's emissions will decline in line with its net zero pathway, albeit without entirely eliminating uncertainty. At the same time, neither option performs perfectly across all evaluation criteria.

Whether the policy ultimately helps realize emissions reductions in the sector "at a pace and scale needed to reach net-zero by 2050" depends on how quickly it is implemented. There is no time to waste. Emissions in the oil and gas sector are still rising, so to meet Canada's climate goals, the government must right the ship as soon as possible by immediately establishing strong policy signals and clear expectations.

Option 1, with the design changes we recommend, may have a better chance of achieving the government's goals because it could be more easily implemented. Granted, Option 1 is an entirely new system that has to be built largely from scratch. However, Option 2 requires changes to existing policy that risk being extremely complex, whereas by leveraging design elements from the federal OBPS and existing legislation, as we recommend, the cap-and-trade option could be implemented more quickly. But how these and other criteria should be weighed is something that the government will have to consider in determining which option to pursue.

Regardless of the option chosen, the design and implementation details will ultimately make or break this policy. Again, both options can achieve the government's desired emissions reductions in the oil and gas sector, but only if the chosen option is implemented in a way that addresses the issues we have raised and integrates the optimal design elements we have outlined. Failing to get the details right—with either option—could render the policy ineffective, costly, and burdensome. Given the outsized contribution of the oil and gas sector to Canada's greenhouse gas emissions, the success or failure of efforts here could be the decisive factor for whether Canada meets its 2030 climate targets and reaches net zero by 2050.

Annex 1: Existing policies for the oil and gas sector

An oil and gas emissions cap will not exist in a vacuum. Multiple policies that affect greenhouse gas emissions in the oil and gas sector are already in place or are in the process of being implemented. These include the federal, provincial, and territorial carbon pricing systems, the proposed CCUS investment tax credit, provincial and territorial clean fuel standards, methane regulations, and the forthcoming federal Clean Fuel Standard.

Carbon pricing in Canada includes two distinct components: a fuel charge which applies to consumers and small firms, and the output-based pricing which is applicable to large industrial emitters. This is the system in all provinces and territories with the exception of Quebec and Nova Scotia, which operate cap-and-trade systems (ECCC 2022e).

Output-based pricing works by providing allocations or credits to firms based on an emissions intensity performance standard, with firms only paying the carbon price on the emissions they do not have enough credits to cover. Firms can also comply with output-based pricing by purchasing additional credits from firms that perform better than the established standard (Dion 2017). Notably, many output-based pricing systems in Canada are operated by provinces and territories, subject to federally mandated minimum standards. For instance, Canada's largest oil and gas producing province, Alberta, uses its own Technology Innovation and Emissions Reduction regulation instead of the federal OBPS.

The federal Clean Fuel Standard will apply to domestic fossil fuel suppliers and compel them to reduce life-cycle greenhouse gas intensity for their products by setting emissions intensity targets that decline over time. Firms comply with the regulations by incorporating cleaner energy in their products or by purchasing credits from other firms (Jaccard 2020). The regulations were only recently finalized so their precise impact on emissions in the oil and gas sector is difficult to quantify, but the aim of the policy is to reduce total annual emissions by 30 Mt CO_2e by 2030 (ECCC 2018). However, a recent regulatory impact assessment of the policy estimates that it will reduce annual emissions by 18 Mt CO_2e in 2030, declining to 9.5 Mt CO_2e per year by 2040 (ECCC 2022d).

In addition to the federal fuel standard, various provinces and territories have implemented clean fuel regulations. The most notable example is the British Columbia Low-Carbon Fuel Standard which has been in place since 2010 (Ding 2022). It resulted in almost 13 Mt CO_2e in emissions avoidance from 2010 to 2020, including over 2.1 Mt CO_2e in 2020 (Government of British Columbia 2022).

The federal government's methane regulations—and its provincial equivalents in Alberta, British Columbia, and Saskatchewan—will also play an important role in emissions reductions in the oil and gas sector. Together, they commit to reducing methane emissions by 40 to 45 per cent

below 2012 levels by 2025 and at least 75 per cent by 2030 (ECCC 2022f). The latest modelling illustrates that current methane regulations are expected to produce a reduction in annual emissions of 39 per cent or 17 Mt CO_2e by 2025 (ECCC 2021).

Lastly, the proposed CCUS tax credit will reduce emissions by subsidizing the high upfront capital costs associated with CCUS—allowing the oil and gas sector to scale up its use. The government's 2022 budget outlines that the tax credit rates would be set at 60 per cent for investments in direct air capture projects, 50 per cent for equipment to capture CO_2 in all other CCUS projects, and 37.5 per cent for transportation, storage, and use from 2022 to 2030. These rates will decline by 50 per cent for the period from 2031 to 2040 before being fully phased out. Notably, only projects that permanently store captured CO_2 are eligible for the tax credit, which would exclude CCUS projects for enhanced oil recovery—a process which uses captured CO_2 to extract oil and thereby increases sectoral emissions (Finance Canada 2022). The intention of the tax credit is to reduce emissions by 15 Mt CO_2e annually (Finance Canada 2021).

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